Appendix-A

PBL Orientation (Power point presentation)

WEL COME

PBL

-A learning strategy of **Vygotsky.**

Important features of VAL

- Every learner is special and unique
- **Learners** do mistake and then learn automatically through use of resources
- learning is a process of creating knowledge
- Learning is holistic
- It is student ownership of **learning**
- The learning environment provide multiple information from different angles
- This **approach** provides scope for social negotiations to design the learning materials
- This **approach** helps in construction of knowledge and social interactions.
- The **learning strategy** is PBL
- Emphasis on **learner-centered** design

PBL process in action

- Loud reading of problem statement
- Exploring the problem
- Listing out the known data
- Listing out the unknown facts
- list out the hypothesis
- Plan of action
- Write up solutions

Table: PBL process

Known data	Need to know	Learning issues

Possible solutions	New learning issues

Solutions

EXAMPLE

Problem scenario:

you are weather forecaster in Mumbai. you are recently concerned about the storm off the Arabian sea. you must predict where it is going and when it will strike the land. once you have collected this information you must give warnings to ships and military that could affected by the storm.

Table: PBL process

Known data	Need to know	Learning issues
•We are in Mumbai •Storm is tropical •It is near Arabian sea	•Where is the location? •Where is the storm on sea? •How fast is it moving?	•What makes a storm tropical? •How are storms classified? •What affects its movements?

Possible solutions	New learning issues
•Where the storm will land?	•Gather new information about barometric pressure ,ocean current, wind scale etc. •About the force of military

Solutions

What will be observed during your work ?

- Real world situations
- Inductively thinking
- Holistic approach
- Describe the meaning of the findings
- Not proving something but understanding
- Bringing general agreement
- Sharing, exchanging in formations empathetically over the content that emerges
- Formal,informal,and non-formal way
- New path of discovery
- Inquiry in depth
- Drawing logical conclusions
- Social and emotional behaviors

GROUP

ONE
- Saket
- Komal chandnani
- Jalpa
- Mridula
- Deepti
- Mamta
- neelam

TWO
- Komal,s.
- Chandini
- Geetanjali
- Tara
- Varsha
- Susmita
- Sarita
- Pallavi
- Anita
- Nikita
- Darshana
- palak

Time schedule of scenario -1

- 06-11-2009 – orientation for **ALL**
- 07-11-2009 onwards to date 15-11-2009 for learning session
- **08.30 am t0 10.30 am for Group- 1**
- **04.00 pm to 05.30 pm for Group -2**

Problem scenario1

Green Dreams

you are resource person with the environment protection organization.

A call came once to you.

"A civilization is growing up in a world whose thermostat was set by carbon's new mathematics number. The number is equated to a global average temperature of about 57 degrees Fahrenheit, which in turn equated to all the places we built our cities, all the crops we learned to grow and eat, all the air and water supplies we learned to depend on, even the passage of the seasons that at higher latitudes set our psychological calendars"

page-1.

Page-2

- You decide to estimate the components of carbon which meets the climate challenge.
- Dig up some roots to check in case it is actually record rise in atmospheric CO_2 level
- Investigate & see if there seems difficult to get greener always
- "Do not stop thinking about tomorrow to be environmentally fit"- suggest on its perspectives
- Recommend on new technology, global environment management to these effects
- You must give warnings that could be affected by this challenge.

learning session

Problem scenario 2

Bugs make you Better

"Bacteria are bad or right ? Not always
Yes, they can cause illness. But some of them are actually
good for you.
In short, while harmful bacteria hate your guts,
good bacteria love your guts."

-devise a safe plan and programme for this possible
good or bad bugs.

learning session

wish u all the best !

Appendix-B

Problem scenario-1 (Preliminary form)

You are a resource person with the environment protection organization.

A call came once to you.

"A civilization is growing up in a world whose thermostat was set by carbon's new mathematics number. The number is equated to a global average temperature of about 57^0 Fahrenheit; which in turn equated to all the places we built our cities, all crops we learned to grow and eat, all the air and water supplies we learned to depend on, even the passage of the seasons that at higher latitudes set our psychological calendars."

- You decide the estimate the components of carbon which meets the climate challenge.
- Dig up some root causes to check in case if they are actually recording rise in atmospheric CO_2 level
- Investigate and see if there seems difficulty to get greener always
- "Do not stop thinking about tomorrow to be environmentally fit "- suggest in its perspectives.
- Recommend on new technology, global environment management to these effects.
- You must give warnings that could be affected by this challenge.

Appendix-C

Problem scenario-2 (Preliminary form)

<u>"Bugs make you better"</u>

Bacteria are bad or right?

Not always.

Yes, they can cause illness.

But some of them are actually good for you.

In short, while harmful bacteria hate your guts, good bacteria love your guts.

➢ Devise a safe plan and programme for this possible good or bad bugs.

Appendix-D

Problem scenario-1 (Final form)

You are resource person with the environment protection organization.
A call came once to you.

The world is growing up thermostatically, put by a carbon's new mathematics number. This number is equated to a global average temperature of about 57^0 Fahrenheit. The increase in temperature may be due to factors of construction of cities in all places, production of crops, air and water supplies being used and even the changes of the seasons at higher latitudes get across our psychological calendars.

-you estimate the components of carbon which meets the climate challenge.

-Find solutions to check in case it actually record rise in atmospheric CO_2 level

-investigate if there seems difficult to get greener always.

-You must give warnings that could be affected by this challenge.

Problem scenario-2 (Final form)

Bacteria are bad or right?

Not always

Yes, they can cause illness. But some of them are actually good for you.

In short, while harmful bacteria hate your guts, good bacteria love your guts.

- ❖ Devise a safe plan and programme for this possible good or bad bugs.

Appendix-F

Content Analysis Format of PBL Problem Scenarios

Categories	Response	
	Positive	**Negative**
Quantity of Explanation		
Quality of Explanation		
Ease of Use		
Allowed Reflection on Actions/ Interactivity		
Enjoyable		
Real World Scenario		
Lack Of Instruction		
Too Simple		
Required More Scenarios		
Not Intuitive		
Incorporation of Data/Pictures/Diagrams		
Others Any(Specify)		

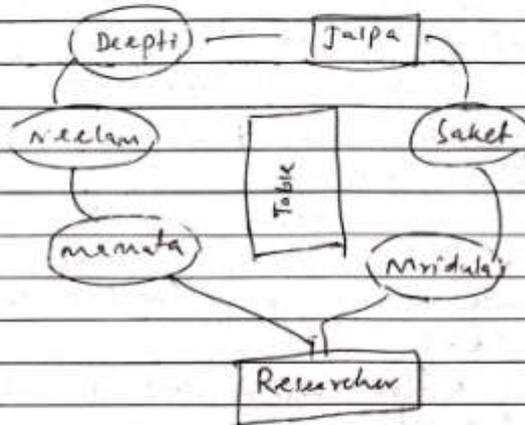Field note   Problem scenario - 1   Page - 1
group T.T.

Date - 7-11- 2009   Time: 8.35 a.m.

Teacher trainees greet with each other.

Mridula read out the statement of scenario. All others
opened their reflective diary during her readings.
          Saket repeated the same, following the hardcopy.
He began to ask mridula about carbon number.
All calculated the carbon number.
Calculation was conversion from farenheit to °celsisus
(understood   Deepti & mamata explained cultivation and production
pollution)   Saket said carbon dioxide increases the temperature.
He told land, air, upper surface of the sea level will
increase, water will move upward.
He then, information — Thermostat — cntd. temperat.
          explained the mechanism through a survey data
mridula: increase in rise in temp.
          - effect towards green house effect.

Field note

Deepti — Silent! Her palm was under the cheek.
Jalpa — observed to mridula.
            eyes were wide opened
mamta — Nodding her head.
All others were focusing towards their diary.

(Jalpa using real experience) Jalpa — gave own idea about rise in temperature.
Neelam — disagree towards her.
Jalpa — Again, informed another issues of religion and global ethics.

Neelam → Mamta inclined forward to find the statement in their own diary.

(Anxious to know) All were going through word by word to locate the data.
All were downward to look into their diary.

mridula explained the meaning of 'new carbon number'.
She gave the reason.
Again repeated population growth & rice cultin.
Saket gave data that '17% popun depend on rice cultivation.

(Awareness of Jalpa & neelam) Jalpa smiled & pronounced the term 'Carbon's new mathimatics number'.
Neelam supported and repeated to ask the question 'what is thermostat?'.

(Thought provoke) Saket informed the drastic condition of geography.
Deepti recognised the learning issues.
She was astonished how methane contributes to 17%. towards gh. effect. & that to negatively.
Jalpa confused how increase in temperature change the Carbon number?
mamta loudly said yes! yes!

Jalpa was slow in her speech.

Mamata, Deepti, — listening with direct eye contact
towards mridula.

Looking all 'easy' towards listening her.

Jalpa nodding her head.

Neelam was sitting with her palm open.

Then, the dr. trainees came to distribute their own work
voluntarily.

Researcher agreed with their division of responsibilities.

Division of work	mamata — 'known data'
	Jalpa — 'Needs to know'
	Sanet and Deepti — 'key issues'
	Neelam — possible solutions.
	Mridula — List out the solutions

Sanet gave 'case-study' of pollution and narrated.
He drew a 'diagram' to explain.
Mridula observing the diagram.

warm up discussion | Neelam & Mamata made querry about the cause of
pollution.

R.C.: The points/data were new and unknown to the group.
. So all were happy towards Sanket. Appreciating.

Discussion: All were intended to go through
the 'known data'. It was listed by Mamata. The
initiation of Sanket helped to lead their discussion.
Leading role of Sanket was identified.

Appendix- H

The Perception scale

S.No.	Statements	MT	LT	VT	T	NT
1	The scenario made me think about the discovery process					
2	The scenario was interesting					
3	The scenario was engaging					
4	I found the feedback and comments useful					
5	I enjoyed the exercise					
6	The exercise improved my knowledge to suggest remedial measures					
7	I would have learnt more from a tutorial on the subject					
8	I would have learnt more from self-readings on the subject					
9	My horizon of knowledge became broadened					
10	I learnt the way of living and working together					

Appendix-I
Checklist Matrix of Dynamics of Behaviours
Of Group- 1 and Group-2

(Dynamics of Jalpa's Behaviour)

Behavior	Example	How Important	Why Important
Willingly participates in the step of Problem Solving	Jalpa was looking towards Mridula with wide opened eyes.	Strong	"Loud reading of the problem statement" was done.
Ability to concentrate on the task in hand	She tried to convert Fahrenheit degree to degree Celsius to know the Indian calculation of temperature	Very Strong	How the global average temperature of 57 degrees Fahrenheit was considered as carbon's new mathematic number?
Joins in conversation with others	She observed the conversation between Deepti and Mamta. She calculated the increase of temperature to inform them	Strong	To calculate carbon's new mathematics number.
Take things positively	She smiled to pronounce the term of 'carbon's new mathematics number'	Strong	To have acquaintance and acceptance with the Carbon's new mathematics number
Join in activities with others.	Jalpa raised the question about the meaning of thermostat. She was considering the idea of new carbon number.	Basic	To solve carbon's new mathematics number.
Joins in teamwork with others	She took the task of "Need to know" one of the steps of PBL.	Very Strong	The distribution of team work to facilitate PBL.
Works well along with a team.	She raised a repeated question about the meaning of thermostat.	Very Strong	To know about global average temperature (thermostat)
Works well along with others.	She viewed about global ethics and religious problem.	Very Strong	To find out the cause of value, ethics and religious problem in the world.
Works well along with Saket	She asked her confusion to Saket by saying that due to rise in temperature there is a change in carbon number which again is due to more CO_2 in the atmosphere.	Very Strong	To make It clear that more CO_2 resulted in the change in carbon number.
Works well along with Mridula	She spoke with slow paced voice about the cause of Carbon's new number to Mridula within the group.	Very Strong	The term "Carbon's new number" was explained to the group with the support of Mridula.

Works well with Deepti and Mamta.	She was listening to Mridula's explanation. She was nodding her head to accept her views. She along with Deepti and Mamta was easy and comfortable to listen her.	Basic	TO acquire some data related to environment.
Thoughtfulness within the group	She was very much silent for a few seconds to explore the term "Carbon's new number".	Basic	To explore the idea of "Carbon's new Mathematic number"
Takes active part in group work	She was listening to Saket's explanation with her hands crossed over the chest. Sometimes putting her views to repeat the concept. She was supporting to Sakest's statements.	Very strong	To know the changing carbon number due to pollution.
Shows interest in others and exchange information	She was excited to support the views of Saket. Her body movement was agitated. She was query about the cause of pollution.	Very strong.	To make discussion about the cause of pollution.
Shows interest on Saket's view.	She was easy, looking towards Saket, smiling and recording information in her diary.	Very strong	To find the records and information about pollution.
Shares his responsibility with others in the group	Mridula, Deepti were suggesting to Jalpa what is to be recorded on the column "Need to know". She was ready to prepare the list accordingly.	Very strong	To find the step "Need to Know" as per PBL.
Shares with Deepti	She suggested Deepti to mention 'thermostat' under learning issue.	Basic	To prepare the list of learning issue.
Shares with Mridula	She asked mridula to mention civilization under the heading of "Know Data"	Basic	To prepare the list of "Know Data"
Ask for clarification when discussing with Deepati and Mridula	She asked for clarification between the meaning of civilization and modernization. She has eye contact towards Deepti and Mridula.	Very Strong `	To know the terminology of civilization.
Anxiety	She was sat opposite to Saket. Her hands were placed on the table, palms were open. she was nodding her head and was looking towards his way of explanation	Very strong	To develop interest to know the fact.
Builds up portfolio of work	Jalpa with her understanding through Saket's explanation prompted to draw a diagram to illustrate the cause of thermostat. All followed to draw the diagram on their own diaries.	Very strong	To keep record of diagram of the cause of thermostat.
Approaches easily to Saket	When saket was clarifying about the effect of increase of CO_2, Jalpa tried to interact with him. She abled to explain correctly.	Strong adequate	To make conversation about CO_2
Works in peer tutoring with Deepti, Saket and Mridula	She added some ideas into text with Saket's resource. She explained to Deepti, Saket and Mridula about the phenomena. All were happy to realize the interaction as interesting.	Basic	To explain the sink of CO_2.
Extended Thinking	She was silent and grave. Her facial expression was grave. She was stroking her fingers to chin. Her palms were placed under the chin, crossed to each other and closed.	Very strong	To make understandable about psychological calendars.

Requests information from others.	She was confusing about psychological calendar.	Strong	To ask about psychological calendar.
Natural curiosity	When Deepti informed about her last night dream that clouds were burning, Jalpa was desperate to think its dangerous effect. She was looking round the group.	Strong	To be aware of pollution.
Prepare an avoidance	Jalpa appreciated the data on global warming and effect of glaciers. She said o.k., and good. The rise in temperature was informed by Saket and the positive effect of global warming was informed by Deepti.	Strong	To know the cause of pollution.
Shares each others	To Saket's discussion, all were putting their views. Jalpa had eye contact towards Mamata. She was attentively listening to Mamata's sayings. Jalpa asserted her right with ease without hurting others. When cloud density due to global warming was said by Deepti, Jalpa appreciated to her statement. Saket informed about water scarcity situation to Jalpa.	Strong	To collaborate on view point.
Shows interest on others.	Deepti asked for Jalpa to give example on Sulphur containing situation. Jalpa was curious to say about dinosaur seen in hot climate. Again she inquired how CO_2 is produced over the sea. She agreed on the sequential change temperature from hot to cold.	Strong	To collect information.
Can adopt according to the situations.	Saket compared "Black Hole" as Black Spot to explain the pollution. Jalpa laughed and realised to say that it is "Black Spot". Saket was very disappointed with the grin reality of the society.	Strong	
Shares each other	Saket put information on CO_2, CH_4 life other carbon compounds. Jalpa informed the cause of reflection.	Strong	To collect information on carbon compounds.
Joins in activity of calculation with others	The rise in temperature was calculated with Deepti and Mridula. She was astonished to see rise in temperature. She was asking about future shock due to such rise in temperature.	Very strong	To estimate the rise in temperature on earth's surface.
Joins in conversation with others.	Mamata was stating the effect on earth's surface to know global warming. Jalpa was listening to her. She focused towards her to listen her sayings. She was highlighting the sayings of others.	Strong	To say the increase in temperature of atmosphere.
Joins in team work with others.	Saket informed about rise in sea level affecting global warming. Jalpa listened with eye contact to him. She asked questions to clarify her doubts along with Mridula. Deepti and Mamata also repeated the same for clarifications.	Very Strong	To initiate conversation about the effect of global warming.

Shows interest in others and exchanges information.	The narration about dangerous situation made frightened to Jalpa. She was eager to know "why of the situation". She suggested remaining alert for future shock. She was repeating the statements to inform about the alarming situations on earth. She was speaking spontaneously.	Very strong	To know about the future situation of the earth.
Reflective Behavior	Jalpa underlined the statements that was extracted form her diary. She was supported by Saket. Mridula was appreciating her. She was repeating the statement. She was writing the main points to summarise in a systemic way.	Very strong	To summarize the points.
Shares each others.	Jalpa calculated 2% increase of carbon occurring on earth. She agreed with Saket's calculation and finding the solutions of the problem.	Strong	To know the rise of carbon percentage on earth.
Build up portfolio of work.	She drew the diagram to show the multiple use of electronics which affects the pollution through release of CO_2	Very Strong	To find possible solution.
Starts conversation with ease.	Jalpa was posing questions to Saket. She tried for fact finding. She was active to accept with understanding. She narrated a story of early periods of her life to show awareness towards the situations.	Strong	To know amount of release of CO_2 through crackers firings.
Positive and Scientific outlook.	The reason for environment pollution was described to find the release of CO_2.	Strong	To be aware about the ways of pollution.
Ask for clarifications when talking with Saket.	Jalpa asked question about vegetation to Saket. Her doubt was to confirm about support of CO_2 to vegetation. She was also asking the relevant data.	Very Strong	To involve actively with the group task .
Resolves conflict easily	Jalpa was disagreeing to the opinion that CO2 helps in vegetation. when Saket showed some research facts to prove that opinion ,she was simple to be convinced. She gave feedback to that effect. She summarizes the comments	Very Strong	To be convinced on the view point of Saket
Active Listening	Jalpa was listening to Saket about case-studies causing environment pollution. The case study of Himalayan was accepted by her.	Basic	To know the cases of pollution.
Access to resources	Jalpa informed vegetation increases the amount of CO2 in the air and due to photosynthesis vegetation is caused.	Strong	To explain the case of vegetation.
Shares her information with Saket and Mamata.	Jalpa reasoned out the situations of the environment. She added carbon-dating and decomposition of CO_2 for discussion with Saket's view point.	Very Strong	To know about taking and leaving of CO_2 in the environment.

Build up portfolio of work	To find the details about the photosynthesis, Jalp searched the material through internet. Her eye contact towards the screen was vigilant. She took the responsibility to search the things on the internet.	Very Strong	To know details about photosynthesis.
Prepares evidence.	Jalpa explained the phenomenon of liquefaction with a diagram. She showed the possible splitting of CO_2 to CO. She also informed which was tried through the experiment at California. She informed the importance of these phenomena to the group.	Very strong	To find possible solutions to the effect of global warming.
Initiate a dialogue	Jalpa made conversation with Saket freely to know about RUBP. Saket explained that RUBP traps CO_2 as research evidenced it. She was saying Yes! And accepting	Very strong	To know the research trend on RUBP and CO_2.
Initiate Dialogue with others.	She raised question about role of DNA, Chromosome to Saket. Deepti also raised a question for clarification. Jalpa responded with openness and honestly. Her conversation was pleasant. She was nodding her head to accept the things said by Saket and Deepti. She said Yes! Yahh!	Very Strong	To find the information about the role of DNA / Chromosome openely
Starts conversation with ease.	Jalpa raised her talk about the change of vegetations. She said about the effect of hybrid vegetations in the use of human body. Mamta, Deepti and Mridula expressed their views in support to jalpa. The daily experiences were shared too.	Very strong	To get review about the concept of vegetation.
Greater access to resources	She reordered the facts informed by Saket about calculation of emission and uptake of CO_2 (Carbon Dioxide). She suggested deforestation to this effect. She also mentioned GWP (Global Warming Potential), CFC (Choloro Fluro Carbon) contributing to CO2. The particulars of green house gases with concentration were listed in tabular form also.	Very strong	To find the estimation of CO_2 in the environment
Reflective behavior	Jalpa made revision about the data displayed earlier. Appreciation to that effect also given by Deepti and others. She listed out the points related to the content. She made a list of table to repeat the data in a systematic manner.	Very strong	To summarize the content.
Shows interest in others and exchange information	Jalpa added some tips about micro-organisms and its effect towards the group task. These were the fascinating facts about health. She also explained different situations.	Very strong	To make active involvement
Open agreement	Jalpa seated close to Deepti and Mridula to listen the experiment of oceanography. She convinced the findings of experiment to Mridual, Deepti and all. She was free to express her opinions. Her hand was flat on the table, palms were open, chest and head was inclined forward.	Very strong	To contribute about the emerging issues of the group task.

Ask for clarification when talking with others	Jalpa questioned how ozone layer is depleted? She was then eager to know the answer. Her eye contact was towards Saket. She sought answer from Saket. Further she quarried about the future effects if such increase of CO_2 will continue? She was nodding. She was attentive.	Very strong	To make conversations continue.
Dignity of Labour	The issue of rise in carbon level was indentified in the group. Jalpa made discussion on some valid points and convinced the group about the issue of deforestation	Strong	To find out the issue of deforestation.
Joins in activities with others.	She felt the dangerous situation of the environment for Saket's explanation. She pointed out the global warning as one of the learning issue. It was supported by Mridula and others.	Strong	To inform the alarming situation of the environment.
Initiate dialogue	She made arguments on effects of global warming towards economic development from both positive and negative point of view Mridula, Deepti and Saket discussed this agenda with Jalpa.	Very Strong	To discuss effect of global warming towards economic development.
Approaches others easily	She read out the list of "Know Data" recorded by Mamata for further validation.	Basic	To read out the list of Know Data.
Leadership	She was convincing the effect of global warming. Her chin was upward, chest was projected outwards. The Palm of both hands was not in contact with each other. The palms were openly kept over the surface of the table. Arms were vertically placed on the table while she was speaking to her friends in the group.	Very strong	To present her view on global warning.
Anxiety	She was asking Saket to discuss next information about pollution. She was clapping her hands. Her head was bent forward towards the group.	Basic	To collect information
Takes active part in group work	Jalpa asked for clarifications to Saket. The point was doubtful. So, she mentioned this point on her diary. The effect of pollution described by Saket was further repeated by her.	Strong	To study the effect of pollution
Joins in team work with others.	She argued about the carbon's new mathematics number. She was grave and silent. She was nodding her head. Her palms were open. She was highly motivated. Her action was speaking louder. She was looking around frequently.	Very strong	To discuss about carbon's new mathematics number.
Works well along with team.	She again readout the statement and underlined the statement of carbon's new mathematics number. She asked why the carbon number is increasing. It was answered by all that the number is not fixed.	Very strong	To ask for carbon's changing number.

Share work with others.	The carbon's number was argued by all. Saket informed the changing number of carbon is mathematically magic. Then she understood new number of carbon.	Very strong	To clarify on Carbon's new mathematics number.
Resolves conflicts.	She agreed with the information of Neelam about the conclusion. She concluded that "Carbon number will never be constant". The group was ready to agree. The group appreciated through verbal reinforcement saying okay.	Very strong	To find a conclusion.
Approaches Neelam easily.	She was supporting Neelam's views, Her gesture and posture was constantly focusing towards Neelam. Her fingers were pointed towards her. She was speaking in high pitched modulated voice with ease while explaining to Neelam.	Very strong	To find the involvement towards the group.
Asserts her right without hurting others.	She shared her own daily experience to the group. Her gesture was frequent. All were eager to support on the topic of environment pollution. She presented problems causing pollution. Her arms were crossed over the chest. She was saying with precision and with no hesitation.	Very strong	To share with others confidently.
Easily makes relationship with others	There was liberal discussion between the group members. She found it as a leisure time activity. All were sitting close to each other.	Basic	To make friendship.
Sincerely expresses thanks for the information	She refined the answers of Saket. She was agreed to his answer. She repeated "CFC is causing ozone depletion" and expressed her thanks to Saket.	Very strong	To give feedback to the answers.
Approaches others easily	The information was threat to the society informed Jalpa. She confidently and loudly said "All are sure to exist and live". Saket was also stayed in tune with dialogue. All were alert, nodding their heads and agreed. It was black hole effect informed Jalpa, Mridula and Deepti.	Very strong	To find suitable condition for acceptance of view points.
Resolves the issue	Jalpa sought to conduct of projects for controlling global warming. She concluded that the Bing-bang theory should be the component to save the society (BRAMHAND).	Basic	To find possible solution.
Shares each other	Saket put information on CO_2, $CH4$ like other carbon compounds. Jalpa informed the cause of reflection.	strong	To collect information on carbon compounds
Asserts his right without hurting others	Jalpa asked question about her existence as there rises 3^0 C in temperature per year. She also informed warming effect in the collapse of innocent creatures on the earth.	strong	To tell the truth

Shows interest in others and exchange information	Saket presented a case-study and some experiments on global warming. Jalpa was leaning forward towards the table to listen attentively .she was nodding her head and saying ok, yes. She was convinced to share actively	strong	To share new ideas with others
Approaches others easily	Jalpa was open to add information on 'Amaranth' Glacier. She was also agreed to inform that economic development of India is going to be destructed due to 'Gangotri' glacier. Deepti, Mridula and Saket apprehended the same about economic growth of India.	strong	To converse with others
Can please others easily	Jalpa questioned when cloud will Vanish? When she presented "Asian Brown cloud"issue in the group, it was interesting to Deepti. she felt that cloud is moving	strong	To find interesting facts
Takes active part in group work	Jalpa satisfied with explanation of Saket. She was convincing those points to the group	strong	To find scientific outlook
Works in peer tutoring	The economic implication due to pollution was moved up by Saket. Jalpa agreed the economic effects changed due to pollution. The data base analysis collected by Saket was exhibited to Jalpa. She was smiling; keeping her hands below the chin and was listening to him. The analysis was confirmed by both.	strong	To analyze the data through sharing
Easily makes relationship	Saket illustrated the effect of global warming with confidence. Jalpa supplemented the points easily. She appreciated his information and said thanks. There was a thrilling within the group after knowing the information.	Strong	To know global effects
Dose expresses her wises to others	Jalpa asked to Saket for certain terms to describe about pollution. She had an eye contact towards Saket and Mridula .	Strong	To participate In the discussion
Approaches others easily	She asked Saket to draw a type of diagram on pollution .when saket was drawing a situation of pollution occurring on earth Jalpa asked to him for repeating the fact. She was asking without hesitation. She was looking towards his drawings.	strong	To involve herself.
Shows interest in others and exchange information	Jalpa supported saket to draw another diagram of earth. She also confused her about the structure of the diagram. She gave some tips for drawing the figure. An imagination to pollution cycle was also suggested by Jalpa.	strong	To involve into Group work.

Approaches others easily	Jalpa with Deepti were agreed to Saket's idea of diagram. Jalpa made conversation with Saket about the diagram. She kept her palms below the mouth and maintained an erect posture.	strong	To give the idea while drawing the picture.
Feels happy when she is in a group.	Jalpa's idea was appreciated by all. Her imagination on making diagram was her dream. She felt happy. She was also encouraged to propose a hypothetical situation about the effect of pollution. She exhibited that situation on her diary. She was constantly touching her face.	strong	To draw the diagram.
Joins in activities with others	Jalpa joined in the drawing work initiated by saket. She engaged to draw other parts of the drawing. She was explaining while she was completing the sketch of the diagram. All were seated close to each other.	strong	To share the work
Shows interest in others and exchange information.	Jalpa and Saket were sketching slowly. She sought clarifications from Deepti. Jalpa accepted Deepti's conversations on this point. She expressed her thanks to Deepti.	strong	To find work together with others
Works in peer tutoring	Jalpa and Saket were checking some concepts. Mridula and Mamata helped to Jalpa in giving some tips. Both informed to include these concepts while making drawings.jalpa was accepting their ideas gladly.	strong	To initiate cooperation
Asks if she can be of any help to others	Jalpa sat in reverse to saket. She was asking which color to be used in the sketch. The work was silently going on. She maintained an erect posture. She had an eye contact to saket. She was looking around. She was fast in her drawings.	Strong	To find agreement
Invites peer to join an on going activity of the group.	Jalpa was encouraging Neelam to draw some portion of the diagram. Saket shared quickly. All were observing towards Saket's work. Deepti and Jalpa were asking to add something in the figure .Jalpa asked Neelam to highlight the colour to show the sun rays in the diagram.	strong	To work co-operatively

Takes active part in the group.	Jalpa sought some clarifications on some parts of the diagram. Jalpa shocked and was saying that "The environment will be no more within our control in future!" When Saket informed about "Asian Brown cloud "caused due to global warming, Jalpa informed one of reason to this effect .she was also informing its dangerous effect to Saket .	Strong	To know the global warming effect.
Feels happy when she is in a group	Neelam appreciated Jalpa in bringing the concept in picture form. Deepti also motivated to Jalpa.	Strong	To find recognition within the group.
Easily makes relationships	Saket was discussing Black Hole effect. A grave conversation was going on among other members. Jalpa was silent .She took a piece of paper from Saket to show outline of another diagram. Neelem was saying O.k to this effect. Saket appreciated to Jalpa and used a black sheet to point out smoke.	Strong	To find one one correspondence between others
Joins in conversation with others	Jalpa interrogated to use the concept of mathematical set theory. She made conversation with Mamata about concept of intersection and union of set. Mamata also suggested putting the different components of pollution in the diagram. She asked for use of orange color to show the cars in the diagram. The group appreciated such work.	strong	To find the resources
Can please others easily	Saket put the evidence of Larsen B ice shelf on Antarctica in order to to illustrate the polluted situation; Jalpa was joining in the work of drawing of the diagram. Even she gave examples of local area of "Nalia" as a case-study. The natural situation made strange and fun to her.	strong	To know the effects of pollution
Works in pair to complete the task	Jalpa supported Saket in his discussion. Her involvement in explaining the statement was appreciated by Saket. Her eyes were sparkling.	strong	To find one one correspondence
Shows interest in others and exchanges information	Jalpa initiated her argument on migration to illustrate as one of causes of global warming. She discussed the global warming effect with Saket and Mridula. She informed green-house effect to explain the global warming. She clapped to accept the information of Saket. Her head was titled forward. She made eye contact towards Mridula.She had high pitched voice.	strong	To inform the effects of global warming

Greater access to resources	Jalpa informed about Tsunami and its effect towards global warming. Her voice was loud. She had high pitched voice. She had straight posture. She tried to communicate the urgency of the situation. She was open.Mridula was inviting her communication. Her eye contact was towards Mridula.Her fingers were pointing towards the materials	strong	To find resourceful material
Prepare an evidence	Jalpa was very much fascinating to explain her experience. Her hands were open, moving left to right, up and down; boy movement was regular and systematic. Her laughing was with loud voice .She reasoned population growth as the cause to global pollution.Saket and Mridula too agreed to those points.	strong	To find out the cause of pollution
Starts conversation with ease	Jalpa asked the formula of CFC to Mridula.she was watching the verbal interaction about the formula of CFC between Saket and Neelam. Deepti asked for composition of R_{12}. Jalpa collected the material and read out to highlight. She discussed with Deepti about the available data. Her eye contact during conversation was towards Deepti,Mridula and Saket.She was closely seated near to Saket .The data was given by Saket	strong	To know about CFC
Approaches others easily	Jalpa was engaged in viewing internet .She dictated to Deepti about the viewed material .She was confused with the points. There was discussion about CFC. For a while, the situation was very calm and quiet. Then, Deepti was eagerly asking about the abbreviation of 'R'. It was also interesting to find out the facts for all.Jalpa was appreciating Deepti.	Strong	To expose the internet material
Prepare an evidence	Jalpa also presented the evidence of CFC, where Ammonia was toxic. She explained the code of 'R' in different ways. She clarified 'R' together with Mridula. She requested to Mridula and Deepti to dictate the materials .She was close near to them. She pointed the cause-effect of the facts.	strong	To know the role of 'R'

Easily makes relationships	Jalpa was ready to note the collected material of Deepti.She was pronouncing the matter while writing .Her voice was slow and comfortable. She was informing to the group "listen, my dear friends! SO_2 is the pollutant in the environment ". She sat close to Saket, Deepti and Mridula. Neelam and Jalpa both were preparing some summary points. She also convinced the same to Deepti, Mridula and Mamata on the view points made by them.	strong	To discus about the pollutants
Takes active part in group work	Jalpa added her clarification to find the meaning of 'thermostat'. She pointed out it to be a major issue. She refereed some pages from her diary to find ideas for some common agreement. She helped Deepti to clarify her doubts .All felt well. Others were also joined to the conversations of Jalpa and Deepti. She had an eye contact towards Deepti. She tried to explain through drawing of pictures.	Strong	To determine the learning issue.
Resolves conflict easily	In deciding the learning issue, Deepti was asking Jalpa what to note on her reflective diary. Jalpa supported to Deepti. Some positive & negative effects were discussed. It made confused to both of them .Jalpa was not sure and confident. So she bought help from Saket. Jalpa was scanning the previous explanation of data. The arguments were explained by Saket & Jalpa was ready to accept the viewpoints of Saket.	Strong	To find common agreement on solutions.
Works in pairs to complete the task	Jalpa added the effects of historical monuments due to pollution. Deepti pointed its economic dimension of global warming. Jalpa requested for other information from Deepti. She asserted to list out under learning issues. Jalpa asked Saket to approve the learning issues noted on her diary. saket pointed out the strength of the learning issue. Jalpa supported him . Jalpa & Mamta were also appreciating his suggestion. All clapped.	Strong	To determine the learning issue
Access to resources	The economic consideration informed by Mridula was supported by Jalpa. She was indicating related to quality of life. Similarly, Jalpa in response to "EL Nino" effect jointed out this as case study. The effect of 'Katrina Hurricane' was also argued by Jalpa. She remarked to recognize these on the learning issue.	Strong	To find the resourceful materials.

Shares each others	Jalpa was finding out certain views from the note book. She was slowly saying. Her voice was low pitched. When Mridula was writing, Jalpa was observing what was written on that note book. Jalpa was adding her view points and Mridula was also accepting to add in her writings. Jalpa & Deepti were agreed to these interpretations. Jalpa was nodding her head by saying o.k. Deepti was repeating the sentences. All were accepting the things. She was agreed & confirmed on these points.	Strong	To reach at conclusion
Prepare an evidence	Jalpa made discussion with Deepti. The prepared summary was discussed between them. Jalpa was trying to modify sometimes when necessary. Deepti was also participating in the confirmation of the same. It was accepted by all. When all were agree, there was a clamor in the hall.	Strong	to agree upon common points
Shows interest in others and exchanges information	Jalpa described a movie related to a situation about global warming. Deepti and Mridula were pointing out this as learning issue. Some questions were asked to Jalpa while describing the situation. She was anxious to listen to the reply of Deepti.	Strong	To find Learning issue
Keeps eye contact while talking with others	Jalpa had eye contact towards Deepti. She was listening actively. She was appreciating her truth accent. Her hands were open while talking with Deepti. She was interacting actively with Deepti. Others were nodding their heads during interaction.	Strong	To discuss the issue
Shares his things with others	Jalpa listened about nuclear fusion and fission from Saket's information. She felt it is dangerous issue for the society. She ascertained the positive & negative impacts of global warming. She informed Deepti & others about its impact through examples. She was erectly postured. She had kept her hands over the table and facing gravely towards the group. She had a talk with Deepti. Both of them were engaged in logical argument.	Strong	To discuss the impacts of global warming
Built up a portfolio of work	Jalpa took responsibility to make list of possible solutions. Deepti acknowledged her. She was revising the materials through reading. Her communication was successful through arguments. She was looking right into her eyes. She paid attention on the facts. When Jalpa was reading out the list, Mridula wrote down those systematically.	Strong	To list out possible solutions

Works in pairs to complete the task	Jalpa was searching some points along with Saket. Deepti was summarizing in an organized way. Deepti was asking questions in order to include the points on the list. Jalpa was repeating the answer through her explanations. She was agreed to Deepti's voice. When Jalpa was making conversation with Saket, she was putting her own experiences. Saket was accepting. She was putting her verbal comments like yes & oh! Oh!	Strong	To see the interpersonal relationship between Deepti & Saket
Works in peer tutoring with Neelam & Mridula	Jalpa was clarifying certain points with Neelam. She was asking slowly and whispering the events. Both were seated face to face while conversation was going on. They were telling their ideas to each other. Others were silently observing to both of them.	strong	To collect information on pollution
Shows interest in others and exchanges information	Jalpa was pleasant to obtain the news clearly .she was nodding her head to show her clear understanding. She was repeating anxiously the view point of Saket. She was also smiling. She was continuously explaining. She was affirmative to her view points. She was appeared to be bold & grave. She was readily answering to the question of Deepti. There was one-to-one interaction between Jalpa & Deepti. Jalpa was indicating her fingers towards Deepti. Her eye was focused towards Deepti while asking questions. Jalpa's point of answering was concurrent with Deepti.	strong	To discuss the information about pollution
Has leadership quality	Jalpa articulated clearly & accurately what are positive effects of Deepti's explanation. Her voice was slow. Her hands were wide, posture of hands were convincing to the group. Her head was inclined forward. Her eye was focused towards Deepti. Mamata & Deepti were nodding their heads. She was appreciated by Deepti.	Strong	To approve Mridula's sayings
Helps out when others are behind in work	Jalpa found her material to show the use of electronic media to check CO_2 & pollutant due to release of carbon dioxide. She sought searching of points in the internet. Jalpa was saying something to the group. Her voice was thrilling. She was sensing the problem & requested Deepti for making note of it. Her discussion was about CO_2 to the group. Neelem was attentive. She had followed her efficiently without hesitation.	Strong	To convey information about pollution

Approaches Mridula easily	Jalpa was convinced about the biological environment. She had eye contact towards Mridula while repeating the sentences. she was highlighting these words to make understandable within the group. She was interested towards accepting Mridula's view points. Both of them were apprehending that future will be uncontrolled. The existence of human beings was questioned by them.	strong	To make correspondence of view points towards with each other.
Takes active part in group work	Jalpa added one case study on green house effect. She was suggesting on use of CO_2. Mamta & Neelem were able to draw a diagram about the explanation of Jalpa. Her speech was loud & accent was clear. Her eye contact was focused rightly towards the center of the group. Her face was appeared pleasant. Her right hand was moved to indicate the points through her fingers. Her posture was erect & comfortable.	strong	To discuss the use of CO_2 towards checking pollution .
Willingly participates in all steps of problem solving	Jalpa was informing the unplugging system caused electric consumption. There was different view of Mamata & Neelem, so she informed a working model related to that. She was informing another issue on Bio-char. she was open and inviting the views of Saket & Deepti towards her discussion. She was inviting others towards interaction.	strong	To know about co2 responsible for pollution.
Build up a portfolio of work	Jalpa explained her views through drawing a diagram. She presented her views in a systematic way both, in verbal & written. Her explanation was easy & comfortable to all. Her point was based on the solution of the problem. Her new idea was diagrammatically presented. It was appreciated by all. Mridula & Deepti were giving feedback.	strong	To find out the alternative solution through use of CO_2
Takes care of others	Mridula was listing out the solutions. Jalpa was accepting & noting it down with her surroundings.	strong	To see activeness

Checklist Matrix (Dynamics Of Mamata's Behaviour)

Behavior	Example	How Important	Why Important
Wilingly participates in the step of problem solving	Mamata bent down to see the matter and read silently the statement line by line which was the task of loud reading .	strong	Loud reading of the problem statement was done
Ability to concentrate on the task in hand	Mamata was inclined forward to find the statement from her material.She was following the loud reading word by word to locate the data.	strong	The location of known data from the problem statement
Joins in conversation with Deepti	Mamata was supporting to view point of Deepti and repeated loudly about the increase of carbon number.Her eye contact was focused towards Deepti while explaining the meaning of new mathematical carbon number	strong	The carbon's new mathematics number was understood
Joins in activities with others	She took care about conversaton of Farenheit degree and Degree celsius simultaneously with the work of Jalpa. She emphasised that new number of carbon might be due to place of isotopes in carbon	strong	To find the meaning of carbon's new mathematical number
Joins in team work with others	Mamata took the responsibility of preparing the list of " known data" infinding the steps of PBL	strong	The work was distributed as per the principle of " division of labour"
Works well along with a team	She informed that the cause of carbon's new number might be due to nuclear weapons	strong	To inform the effect of use of nuclear weapons towards the change of carbon number
Works well along with Mridula	She was listening to Mridula's explanation about the topic of carbon number.	strong	To find out the carbon's new mathematical number
Acceptance to view point of Mridula	She had eye contact towards Mridula.Her fingers were extended along the cheek. She was easy and comfortable to listen to her	strong	To get the data
Thoughtfulness within the group	He was calm and quiet for a few seconds to think about the new mathematical number of carbon	Adequate	To get an idea about carbon's new mathematical number
Takes active part in group work	She put her view over the explanation of Saket to confirm her understandings	strong	To know the situation of carbon number changing through pollution
Shares his rsponsibiity with others	She listed out the 'known data' as per the clarification of group	Strong	To find out the given data in the problem scenario
shows interest on saket's view	She recorded the data put forth by Saket.She was easy,comfortable, looking towards Saket.She was to the point and silent to write these points on her own diary	strong	To record the information about pollution

Shares with Neelam	She talked in a loud voice with Mamata to know the amount of CO_2 in the atmoshphere level.They were sat opposite to saket and Jalpa. She had eye contact towards them.	Strong	To know about CO_2 with the assistance of each other
Dignity of labour	She maintained her responsibility to keep the list of known data.she wtote the term civilisation under "known data" column as per the suggestion of Mridula	Strong	To list out "Known data"
Shows interest and exchange informations with Saket	She was sitting opposite to Saket.Her hands were placed on the surface of the table.She was listening without hesitation. She had an eye contact towards his way of narration.she was saying 'okay' and 'that is true' in between his explanation.	Strong	To know the cause –effect of CO_2
Greater access to resources	She made contribution to understand the concept of thermostat with the help of Saket.	Strong	To make clarification of thermostat
Dignity of labour	Sha agreed with the finalisation of learning issues done by Deepti and others.she was silently recording the points.when Deepti was preparing the list of learning issues, she was in favour of the written arguments .	Basic	To list out learning issue
Prepares an evidence	Saket's informaton about the dangerous situation of the fututre due to increase in surface temperature shocked Mamata and others. She felt the alraming situation and joined in the loud discussion	Adequate	Felt the dangerous situation of food production
Action oriented	She was recording the points under "known data" after it was verified by Jalpa	Adequate	To prepare the list of "Known data"
Works in pair with Neelam	She along with Neelam was recording and verifying the points of the readouts of 'known data'	Strong	To find the list of "known data"
Ask for clarifications when talking with others	Saket was ready to refer resourceful materials for his narration .Mridula asked for larifications .She said it was unknown for her. The group was also unable to answer.she suggested to note the doutful point for further reference on the next day	Strong	To seek for clarification from the group
Shows interest on others	Arguments on Carbon's new mathematical number was continued.Mamata was silently listening,nodding her head and said okay!, 'this may be true! She was rubbing her palms,head was titled forward and kept eye contact towards the arguments of Saket.	Strong	To know carbon's new number
Shares each other	Carbon's new mathematical number was questioned by Mamata to Jalpa.she asked why the carbon number is increasing ?Saket quickly replied as 'due to enviornment pollution'	Strong	To know changing number of carbon
Resolves conflict easily	She clarified her doubt on the significance of the statement about carbon's new mathematical number. The statement was dicussed and general agreement on carbon number was resolved within the group	strong	To find common agreement on the statement

Approaches Neelam easily	Neelam concluded that "carbon number will never be constant" Mamata appreciated her statement.she repeated the statement by saying "carbon 's new mathematics number was changing". she was easy and comfortable to her	Adequate	To find relationship
Can adopt according to the situation	Jalpa was saying her daily experience to the group with reference to the enviornment pollution. The group discussed about the problems.some were unscientific.so there was laugh and expressed amusement in the group.Mamata smiled and started general discussion to find some leisure time activity.	Basic	To find the leisure time for discussion
Joins in team work with others	Previous work was read out by Mridula . Mamata was underlining the sentence extracted from the text .she was closely seated with Deepti and Jalpa.	Adequate	To revise the previous work
Shows interest in others and exchange information	Mridula emphasised that rise in temerature creates problem to the enviornemnt.Mamata repeated her statement. She was nodding her head while Mridula justified the statement.Her head was titled,had lot of eye contact towards her.she was attentive ,responsive and was saying okay in between her listen in.	Strong	To reflect on idea of rise in temperature of the enviornment
Building up a potfolio of work	Mamata was predicting and informed about the future being exclaimed if rise in temperature will be increased moe and more! she was shocked about the situation.she indicated the stated points to the group .Her palms were open ,placed on the table.she was reflective to record a paragraph.	Strong	To develop portfolio of writings
Shows her work with others	Mamata pointed out the dangerous situation of the enviornment.she tried to alram the danger to the group.She was ready to accept other' view.she was evaluating the alraming situation.	strong	To elicit co-operation
Works well along with a team	Saket informed that " rise in sea level is the effect of global warming". Mamata was readily accepted. Her palm was below the chin,head was inclined forward and nodding in tune with the speaking of Saket.She was looking around frequently.She was attentive.She had made a querry about the situation.she was comfortable to receive answer to her questions made by Saket	Strong	To discuss the effects of global warming
Feels happy when she is in group	Mridula raised the question to clarify Saket's view.when Saket replied the answers ,Mamata was easy,comfortable and silent to know these.She was repeating the answers .she herself was explaining and her eye contact was compact towards the group.Her facial expression was smiling	Adequate	To add views towards the group

Active listening	When Saket and Mridula were convincing to the group on their views related to effect of global warming ,Mamta was nodding her head, kept eye contact towards Mridula,seated near to Mridula and recording on her diary at-a-distance.She was open. She was uttering 'okay', 'that is ntrue' in between her conversation.She was smiling occasionally.	Strong	To become good listener
Conflict resolution	When global emission as burning problem was informed in the group,the alraming situation was realised.For a while,there was limited silence.Mamata along with others came closer to each other.It was all right to consider that global emission increases the carbon number.she was bent down towards the centre to locate the statement.	Strong	To find a solution
Greater access to resources	She informed global warming was called as Joseph Fourier during 18 th century.All were eagerly recording her statement in their reflective diaries.Further,she was recording the view point of Saket about the increase of CO_2 to add as resources	Strong	To distribute the information
Feels happy when she was in group	When Jalpa was explaining With a diagram about use of electronics and its effect towards pollution,Mamta was attentive. She was comfortable to pay attention. Her seat was forward,head was inclined forward. He along with others accepted the conversation and was verbally praising ,saying okay,yes! She sat solidly with support of arm swings .she was cheerful and smiling.	Strong	To make association with the group
Approaches others easily	She was listening to the amazing facts told by saket.she accepted those infomations.She along with Deepti was considerate to cite examples.she was engaged with others in sharing the ideas during discussion .Mamata and Neelam were nodding their heads while recording on their diaries.	Strong	To find scope in exchange of information
Expresses her wishes to others	She felt the seriousness of the problem of global warming.she sensitised the problems, challenges, worries of people affected slowly due to global warming.she viewed and shocked about destruction of the society and the community and informed to be aware of the matter!	strong	To feel the problems of global warming
Joins in the team work with other members	Mamata raised a question on Saket's explanation of vegetation.Deepti reflected on vegetation supported by CO_2 with relevant data	Strong	To find role of vegetation towards global warming

Takes active part in group work	Mamata reacted to the rise of temperature due to CO_2.she informed the carbon content as 283 ppm during 80's and at present it is 356 ppm. She also raised the problems faced in food habits which led food poisioning.	Strong	To convey the extent of carbon
Shares each others	Argument that 'vegetation do not support global warming, was carried out by Mridula and Mamata.she had eye contact towards Deepti and Saket.Deepti,Mridula and Mamata reflected the analysis of Saket to clear the doubt	Strong	To clear about vegetation
Shows interest on others	Mamata clapped after listening to Saket's view . Her facial expression was easy, She acepted in a positive way.	Strong	To accept others
Request information from others	Mamata learnt case study and examples causing enviornment pollution	strong	To illustrate case study
Sincerely expresses thanks for the help received	Mamata was silent,grave,looking to others,slowly whispering about the matter to Deepti and Saket.Her palm was under the cheek. She was learning forward towards the table.	strong	To understand the fact with empathy
Shows interest in others and exchange informations	Mamata raised the issue of carbon dating and decomposition of CO_2.Saket and Jalpa viewed on this aspect and shared informations	Strong	To add further resources towads group learning
Wilingly participates in problem solving	Mamata focused on research trend of RUBP and CO_2 told by Saket.She was interested to include the effects of RUBP towards pollution.she also responded appropriately to the positive effects of RUBP.	strong	To find another issue of RUBP
Takes active part in group work	Mamata was nodding her head saying 'yes' 'OK' .sometimes she was writing some points .Her head was bent down towards her diary,hands were relaxed over the sides of the table.she was observing the data presented by Saket. she then tried to compare that data.	Strong	To sensitize the fact and data
Feels happy when she is in a group	Mamata was agreed to Saket's view.She was saying THAT IS TRUE. Her hand movement was convincing about the points.she was comfortable to accept the ideas of Saket.	Strong	To develop empathy
Works in peer tutoring	The change of vegetation and its effct to the society was discussed.Mamata shared her experience about present day vegetables-its taste, look and etc. "Even,the juice of coconut is polluted by man" narrated by her.There was laughing towards the situation.	Strong	To know adulteration in food
Initiates dialogue	Mamata knew through the data the potential of green house gas towards the cause of global warming. she tried to communicate the data given by Saket within the group .she was keeping eye contact towards Saket.	Strong	To feel the need of CO_2

Does express her wishes to others	Mamamta communicated non-verbally about green house gases.she was shocked about future days. She switched to inform about fascinating facts about health.Different situtions were explained by her. She had eye contact towards Saket	Strong	To find group approval
works in pairs to complete the task	Mamata was convinced well with experiments conducted in different gographical areas.Saket was appreciated by her. Experiments with global warming in some developed countries were illustrated by Saket. The discussion was led by Saket.	Strong	To know global warming
Access to resources	Mamata pointed out different types of diseases caused by pollution.She named Lyme diseaes,Leishmaniasis and etc.It was shocked by the group memebrs.There was future shock!	Strong	To know the names of diseases caused by pollution
Can please others	The future shock was subsided by Mamata's narration to the group. 'The BRAMAHANDA will save earth.It was destined' said by her. All were comfortable and relaxed by listening to her.	Strong	To know about future shock
Ask for clarifications when talking with others	Mmata was doubt about the torpical regions of world. Both Neelam and Jalpa were rubbing and touching their eyeys and ears.Saket explained the geographical conditions of Africa.Deepti and Mamata appreciated through saying Yes, and OK.	Strong	To clear the doubt
shows interest on others	Mamata inquired acidification of ocean and told the cause is due to carbonic acid .It was supported by Saket. The PH value of constants was listed by Mamata and others to know acidification.	Strong	To know the acidification of ocean
Takes active part in group work	Mamata with an erect posture, sitting straight and spoke to the memebrs. She was speaking with slow paced and low pitched voice.Hands were placed besides the hips and palms were open. Finger tips were directed to the centre of the table. She was presenting the data related to pollution.	Strong	To show confidence about the matter
Has ability to concentrate on the task in hand	Mamata addedd to support the points of fossil fuel combustion said by Saket. She had an eye contact towards Saket. The view points were appreciated by all. Saket informed that cloud density had changed due to global warming.Mamata emphasised that high release of CO_2 helped in vegetation .Jalpa was recording it.	Strong	To find the task related to global warming
Works in pairs to complete the task	Mamata informed water acidification which has caused acidification of soil.Saket gave example of **Siachen Glacier** to this point.He concluded the situation of glacier is due to pollution and global warming		To find evidence of acidification

Greater access to resources	Mamata again raised the querry about cancer.she asked how it is created? Saket found glacier may cause the cancer.	Strong	To know the reason about cancer
Works well along with a team	Maamta bent right towards Mridula. She shared her views with Mridula.The information elevated the diatomic position in the formation of oxygen and carbon dioxide.Deepti was pointing which was interested to her.Jalpa was indicating her fingers to show agreement with the points. Saket too took positively and was saying O.K and Yes. All were listening actively with an eye contact towards Saket.	Strong	To find the views of all
Wilingly participates in problem solving	Deepti explained composition of carbon in the enviornment.Mamata also added some point from her resource.she questioned how it occurred in the enviornment.Saket took care to make understandable to all.	Strong	To know different forms of carbon
Shows interest in others and exchanges information	Saket put forward a case-study and an experiment to understand the situation.Mamata shocked about the future when gone through the case-study .she was leaning forward to listen attentively.sometimes clarification was sought.there was gesture-posture of hands to indicate the points.ideas of Saket were gently accepted by her.	Strong	To communicate better
To take things positively	Saket informed rapid shrinking of the **Himalayan glacier** and hence the cause of global warming.Mamata shocked to inform the group that indians will face devastation of economic and social consequences.	Strong	To know future effects
Works in pair to complete the task	Saket informed the ozone layer and Black Hole effect.Possible solutions were readout.Mamata was agreed to him.Her voice was loud .she was pointing her fingers upward.	Strong	To find the pair work
Sincerely expresses thanks for the help received	Saket informed economic implications due to pollutin.Mamata was very prompt to record those data .she was smiling, kept her hands below the chin listening to Saket's analysis.she expressed her thanks to him.when Saket was describing the effect of global warming,Mamata and Neelam paired together to supplement the points.	Strong	To undertand others with appreciation
Joins in teamwork with others	Jalpa and Saket planned a diagram to sketch related to pollution.Mamata apreciated Saket and suggested to show the rivers in the diagram.she was imaginative to see the diagram.she informed to indicate Ultra Violet light coming more in the diagram.she had eye contact towards Jalpa.she had crossed her fingers.	Strong	To draw a hypothetical diagram

Shows interest and exchange informations	Mamata kept her palms below the lips and maintained an erect posture to look the conversation of both Saket and Jalpa while deciding the elements about the diagram.She was very comfortable and easy to observe the drawings.	Strong	To discuss about the diagram
Approaches others easily	Mamata along with Mridula helped Jalpa in giving some tips. she informed to include their own concept while making the drawing.Saket and Jalpa were also agreed to those points.There was group effort in completing the diagram.	Strong	To facilitate the drawings
Asserts her right without hurting others	Mamata was indicating about the transport system to include into the diagram.Mridula supported the work of Mamata.she was also herself added some tips to complete the diagram.The cause and effect of the matter suggested by her was welcome in the group.	Strong	To find the complete structure of the diagram
Take things positively	Mamata was sensing the situation.she put question to Mridula.Mridula repeated Mamata's statement and raised her voice.Mamata shocked about the future position is alraming! she felt the enviornment will be uncontrolled one day.	Strong	To alarm about the future event
Greater access to resources	Mamata raised her view that industrilisation gave rise to pollution.she also informed that "vehicles are the causes to pollution". She outlined the diagram to convince others.she had no hesitation to inform others.	Strong	To point industrilisation as the cause of pollution
Invites peer to join an ongoing atvity of the group	Mamata asked for use of Brown colour to sketch the diagram.she welcome others to join and complete the work.Neelam was saying OK and agreed to the point suggested by Mamata.Neelam was happy to do the work.Mamata informed to include the concept of modernisation.It was appreciated by Mridula.After completion of the diagram ,the future shock was felt and discussed to find posible solutions.	Strong	To complete the diagram
Takes active part in group work	Mamata made conversation to find pin-pointed solutions.she joined in the argument of migration to establish as the cause of global warming.She shared in the discussion of global warming effect.she supported that global warming affects migration.she had an eye contact towards Saket during conversation.she put her palm below the chin.Her index finger was pointed along the cheek.she was thoughtful and confident.she was more repetitive while accepting Saket's ideas.	Strong	To know the cause of global warming

Shows interest others	She interferred to clarify the concept of global warming and globalisation.she had eye contact towards Deepti and Saket.	Strong	To know globalisation effect.
Joins in activities with others	Mamata was listening the evidence of natural calamity presented by Saket.she was trying to ask Neelam for her discussion.she was silent and easy.she was also writing the points of the discussion.she had eye-conytact towards Saket.	Strong	To discuss the cause of pollution
Approaches others easily	Mamata asked Saket about formulas of CFC. He clarified that it was correct. The two fornmulas of CFC were CCL_2F, $CCLF_2$. Mamata in relation to the use of CFC in refrigerator informed that chemical compound R_{12} is used.Mridula inquired about the role of CFC.when Jalpa read out the sentence, Mmamata was noting the data in her notebook.she was smiling and was comfortable to each one and all	Strong	To know about formula of CFC
Requests information from others	Mamata asked for the position of 'R' on the periodic table.Jalpa and others were interested in collecting the material.Saket and Deepti both tried to find the facts.She said it was good.Mamata was undestanding the concept of 'R'.it was logical.	Strong	to know the concept of 'R'
Built up a portfolio of work	Mamata narrated the casestudy of global warming of **Hurricane Katrina** which was more violent.shr pointed out CFC as the pollutant of global warming.She then located its formula saying as one of Miracle chemical . She was saying some principles to support the belief.she had scientific outlook.she was looking towards Saket.Saket was providing feedback through repeating her statements.Her hands were relaxed and slow .Her face was pleasant and easily expressed.Her posture was comfortably erect.	Strong	To convey Hurricane Katrina case-study with confidence
Willingly particpates in all steps of prob;em solving	Mamata was asking some point to Saket.Saket accepted those points raised by Mamata. The data was validated by her. The referred data shocked to all said Mridula.There was agreement to Saket by Mamata.	Strong	To validate the data about global warming
Easily makes relationships	Mamata came forward and read out the statement about SO_2 as the pollutant in the enviornment pollution.She searched the material from internet.she displayed the diagram of chemical bonding and molecular shape of compounds on the screen.Neelam sought clarification from her.Mamata came close to make understandable to her.Deepti and Mamata supported to the discussion of Saket .she was shy and silent.Her voice was slow and submissive.	Strong	To find pollutant in the enviornment pollution

Joins in team work with others	Mamata joined in group-doubt on clarification about **thermostat**.she along with Mridula and Neelam put their ideas to find a common agreement.she also supported to the points raised by Neelam and wrote down the same.She was seated middle of the row.she was grave and her eye was focused.	Strong	To find and discuss the major issue of Thermostat
Access to resources	Mamata added the genetic roles to explain mutation.Saket was supported to her explanation.she was sharing her ideas with Saket.she was listening keeping eye contact to him. She was acepting the ideas. She had maintained an erect posture.Her eyes were focused to the members while talking to them	Strong	To find the role of mutation
Exchanges information with Jalpa	Mamata said OK. towards the description on effect of effluence of historical monuments.she also informed the destruction of iron rods due to chemical reaction in carbonic form.Jalpa recorded the learning issues pointed by Mamata	Strong	To illustsrate the efffects of effluence
Resolves conflict	Mamata spotted the learning issues without hurting others.she was leaning towards Deepti at-a-distance to find the approved learning issue.she was silently observing others.The other members joined during her conversation and exchanged their views.Jalpa and Saket supported to her. Mamata was appreciating the suggestions of Saket and Jalpa.There was clapping in the group to receive her suggestions.	Strong	To resolve the learning issue
Shares each others	Mamata argued on the effect of pollutants with the increase and decrease of water.Both Neelam and Jalpa were nodding their head.Mridula pointed out economic considerations due to pollution.Mamata was excitied to give her experience and that was recordrered by Mridula.Mamata helped to exchange her seat to support in her writings.she had firm eye contact towards them.	Strong	To discuss about pollutants
Starts conversation with ease	Jalpa's discussion about **EL Nino** effect was pin pointed.it was the case study of cyclone.Mamata asked Jalpa to add the effect of Brown Cloud 'seen above indian ocean.Saket was agreed to add this effct .she also indicated **Katrina Hurricane effect'** to include under learning issue.	Strong	To initiate dscussion about case study of cyclone

Prepare an evidence	Mamata and Deepti tried to prepare "learning issue". They were discussing the appropriate meaning of words to frame the sentence. The two words 'disappearnce' and 'disoccurrence' were confusing to the group.Mamata suggested "disoccurrence' to put in the paragraph.she argued in the context of summer season and suggested such word.She also indicated CFC' as the major issue. She was confident.All were agreed to this point .The learning issue was emphasised by all.		To finalise the learning issue
Works in pair to complete the task	Mamata and Saket both explained the points again to include under the learning issue.The discussion was repeated by Mamata. She was making notes about few interesting points.she was easy and comfortable to note on the diary.while the recording was finalised,she smilied.Mridula and Saket were providing feedback through repeating the questions and statements.she was closely seated to saket.	Strong	To promote collaboration in resolving the point
Easily makes relationships with Deepti and Mridula	Mamata made conversation about scientific nomenclature with Deepti.She had an eye contact towards Deepti and Mridula.she was observing what and how the noted points were recorderd by Mridula.Mridula was also supporting the conversation before writing the points on the diary.Mamata was close to them.Her arms were vertically placed on the table while the hands were gripping the edge. Her tone of voice was low pitched.	Strong	To find one-one relationhip
Take things positively	Mamata was herself involved in the preparation of findings.she was also supporting to Deepti's argument. She was underlining the statements.she kept her eyes focused and was grave to see the writings.The finding was accepted by Mamata and all .she was sitting near to Jalpa.she emphasised those points and prepare a list accordingly.	Strong	To list out the concluding points
Works well along with team	Mamata was listening to Deepti about learning issues.she asked questions to her related to Bacteria.she had faced towards Deepti and Mridula while asking questions.Mamata was smiling. she along with Deepti provided feedback to her.she had eye contact towards Deepti.she was interacting actively to Deepti's statement.	Strong	To find learning issue

Shows interest in others and exchanges informations	Mamata conveyed about the solution of connsumption of oil used in the vehicles.she made a note about awareness of people for checking global warming.she was also observing the conversation between Saket and Jalpa on global warming.	Strong	To study consumption of oil towards global warming
Shares each others	Mamata and Neelam were sharing their views to discuss on **Kyto-protocol** issue.The release of CO_2 to the enviornment was discussed by Mridula.Contribution of natural resources towards global warming was informed by Mamata.she was also discussing about nuclear energy and its effect. She informed about serious effect of consumption of nuclear energy.Its solution was also highlighted by her.She was open to accept the feedback from others	Strong	To discuss on Kyto-protocol issue
Access to resources	Mamata further suggested about the use of electrical vehicles to reduce global warming.some innovative measures towards global warming was informed as relayed on the discovery channel	Strong	To focus on electrical vehicles
Does express her wishes to others	In order to discuss about the effect of CO_2, Mamata put the case of nuclear fuel.Mridula appreciated saying Good! Good!. Deepti was writing the decided points.she was looking right into her eyes.She was straight forward to pay attention on the facts	Strong	To convey about nuclear fuel towards pollution
Share hrer things with others	Mamata added information about use of polythene.Neelam inquired by further saying 'what the point about ?' Mamata had replied to find a layman's solution.All felt about CO_2 emission.Mamata and Neelam were facing towards each other.Mamata was happy in putting her ideas. The possible solutions were recordered by Deepti .Mamata was encouraged by Saket through words Yes, Yes, and 'ACCHHA'		To put the use of polythene which affct pollution
Requests information from others	Mamata was looking with an focused eye towards Jalpa .Her head was bent forward.she was excited and interested.she had maintained an erect posture.she was focusing towards Jalpa during her conversation.She had kept her finger tips of both hands together.She was asking Neelam for inclusion of some points to their record.	Strong	To derive possible solutions
Approaches others easily	Mamata interacted Deepti about the points raised by Mridula.After conversation, they were agred to the points.Neelam was encouraging Mamata saying OK.Mamata sought for clarification through searching the internet. Deepti wrote the points	Strong	To discuss the effect of CO_2

	smoothly.she was seated close to Deepti.She aked Jalpa to speak slowly. All stayed in tune with the conversation between Deepti and Mamata. She was verifying all points were included or not?		
shows interest in others and exchange information	Mamata was eager to draw a diagram after listening Jalpa's suggestion.She made a sketch about Jalpa's explanation.She was recording in her reflective diary.She was easily expressing her words. She took place her seat near to Jalpa and Neelam.She was encouraging Jalpa about her arguments.she was ready to put her ideas related to pollution.she suggested how to reduce pollution due to consumption of oil.Jalpa and Neelam were appreciating her view.	Strong	To find possible solution inorder to get rid of pollution
Joins in conversation with others	Mamata explained **Bio-char** in relation to pollution.Neelam was repeating her sentence.she was smiling after her completion of explanatin.Mamata was highlighting about the alternative to oil consumption. She was looking towards Deepti and Neelam.others were listening. Mridula was providing verbal comments like Yes!,Yes!.	Strong	To find solution of pollution due to consumption of oil
Shares his things with others	Mamata provided a daily news about the use of 'Vanaspati Ghee'. she further explained about the product of Hydrocarbon which added to pollution.Neelam was noting. All others were following the diary. Jalpa and Saket were appreciating the information	Strong	To know hydro carbon as pollutant

Checklist Matrix (Dynamics Of Mridula's Behaviour)

Behavior	Example	How Important	Why Important
willingly participates in the step of problem solving	Mridula took up the task for loud reading	Strong	The first step of problem solving was done
Ability to concentrate on the task in hand	She was slow and comfortable to ask to the group .she asked what viewed about carbon number	Strong	The meaning of "new carbon number' was tried to understand
Joins in conversation with Deepti and Mamata	She told carbon's new mathematics number is due to the increase of number of carbon composed in the air.She supplemented the conversation between Deepti and Mamata.	Strong	The change in carbon number was explained
Acceptance to Mamata's view	She appreciated the view of Mamata through explanation of isotopes in carbon .she said good and poilitely accepted her answer.	Strong	Carbon's new number due to the situation of isotopes in carbon was emphasized.
Joins in team-work with others	She took the responsibility of making list of solutions	strong	Division of labour was significantly followed.
Works well along with a team	She narrated rise in temperature due to green house effect which brings in change in carbon number.so, the carbon's number becomes new mathematical number	strong	Argument on how carbon's new mathematics number was possible?
Works well along with Neelam	She emphasized the importance of meaning of thermostat raised by Neelam	strong	To explain the important meaning of thermostat
Works well along with others in a team-work	The word "carbon's new number' was clarified by her.Jalpa, Deepti, Mamata were listening .she had eye contact towards them.Her fingers were extended along the cheekh. Her sayings were loud.	strong	To share the knowledge about "carbon's new mathematics number' in the team work.
Thoughtfulness within the group	She was silently thinking about the term carbon's new mathematics number for a few seconds	adequate	To get the idea about carbon's number
Takes active part in group work	She was accepting Saket's view through repeating the main statements and was verbally prononuncingYes, Yes!she was putting her view sometimes with the issue explained by Saket	Very strong	To know about the cause and effect of pollution
Shows interest on Saket's view	She was interested to write the data.she was easy, comfortable, smiling and looking towards Saket's face. She listened to his narration.she was recording the information in her reflective diary.	strong	To highlight the explanation on current situation of pollution

Takes care of Jalpa	She was suggesting to Jalpa what is to be recorded under the heading "Need to know".	Very strong	To facilitate the group work as per division of labour
Takes care of Saket	She was deeply observing the diagram drawn by saket related to Green house effect and appreciated with understanding	strong	To understand the effect of Green house gases
Take things positively	She understood the diagram and appreciated giving thanks. She clapped.	basic	To appreciate the diagram
Active listening	She kept her palms under the cheek while listening to the arguments. She was pointing to note down civilization instead of modernization.she kept eye contact towards Jalpa, Deepti and Saket.she was attentive.She told Yes, while the conversation between Deepti and Jalpa was going on.	Very strong	To pay attention civilization and its meaning actively
Negotiates and compromises with Mamata ,Jalpa and Deepti	She made arguments with Jalpa between civilization and modernization.Jalpa and Deepti supported to Mridula to mean civilization as modernization.All agreed to write modernization. Mamata was also ready to record on headings of 'Known data'.	Very strong	To find out agreement on some common points
Share her work with Deepti and Mamata	She tried to explain the concept of 'thermostat' along with Deepti and Mamata. They clarified the concept when talking with each other about the example of 'Thermoflask'	strong	To clarify the concept through sharing of knowledge
Approaches others easily	She narrated the principle of 'thermoflask' to make understandable to Jalpa,Neelam and Deepti with the support of Saket.she had an eye contact towards Saket.she was smiled frequently, of course with courtesy.Her head was inclined forward.Her wide opened eyes were faced towards Deepti and Jalpa.	strong	To promote relationship through group-work
Can please others	She was amenable to the view points of Saket, Neelam and Deepti. She said that the idea of Saket was very new concept.	strong	To know the acceptance level
Ask for clarification when talking with Saket and Deepti	She clarified about the different seasons like rain, winter and summar which were passed by us. Deepti and Saket answered about psychological calendar.	verystrong	To clarify about psychological calendar
Dignity of labour	She interacted with others to identify the learning issue.she made a talk with slow pitched voice with Deepti to confirm the issues.she made conversation with Deepti.Deepti was also supportive.		To find out learning issue as per the steps of PBL
Asks for clarification when talking with others	There was difficulty to categorise the learning issues.she asked and suggested accordingly in order to find out major and minor learning issues to Deepti.she argued with Saket and Deepti on the points with their consequences towards learning issue.	strong	To find out the learning issues

Works in peer tutoring	Saket informed that a slight increase in surface temperature adversely affect the world food production.she along with Deepti extended their discussion to sensitize the alarming situation of the environment.The discussion in team move up into loud voice and noise. The group voiced Oh! Yah!	Very strong	To sense about the enviornment
Shows interest in others and exchanges informations	She supported to Jalpa on the discussion of global warming as one of the learning issue.she argued on economic development. Others involved discussing with her.	strong	To find out economic development as learning issue
Easily makes relationship	All were excited to discuss with Saket's views.one after another ,all were ready to add their views.she marked that views were overlapped .she made request to listen each other's view.For a while ,it was silent completely.After that all made thanks to ech other	strong	To initiate exchange of views
Joins in team work with others	The narration on effects of pollution by Saket was listened by Mridula.She repeated the matter for further clarifications.She posed some questions in front of the group.All were thinking about the possibility of carbon number.	strong	To discuss the possibility of carbon number
Resolves conflicts easily	The group was doubtful about the statement of carbon's new mathematics number.she was also questioned why the carbon number increased? She along with Saket and others discussed and found that the changing numbermight be mathematical magic.	strong	To find common agreement on the statement
Approaches others easily	She sat closely near to Saket and Neelam.when Neelam informed the conclusion that "carbon number will never be constant" she appreciated saying 'Okay'.	strong	To come closer to each other
Enjoys fun	When Neelam was excited to say about Carbon's number/She supported her views.She was pleasant to get the informations.she was forward in her body movement.some daily experiences were put forth by Jalpa .at that time, there was laugh in the group.	strong	To share on daily experiences
Has leadership qualities	Mridula introduced that the rise in temperature creates problem to the environment.Mamata, Deepti were listening to her. Saket did a sketch of rise in temperature due to vapour state.	strong	To present the issue of rise in temperature

Joins in team work with others	Mamata stated the radiation absorbed by CO_2 and H_2O was partly remitted to earth's surface.Mridula was open.Her gesture was repeating the matter.She was confidential.she asked question to Saket and Mamata to know the facts further.she tried to convince the group about the facts.	strong	To co-operate to the group work
Startsvconversation with others	Mridula was engagaed in explaining the matter fluently, leaning forward with openness.All were facing in the direction of Mridula.They were agreed with the subjects .All were listening actively.Eye contact towards Saket's explanation was firm.	strong	To be a focus towards her views
Shares his things others	Mridula was listening to Saket's view on post effect of increase of CO_2.she was nodding her head .while she was listening, her hands were below her chin,sometimes stroking her chin	strong	To reflect the views of Saket
Negotiates and compromises with others	Jalpa explained a way to check pollution through multiple use of electronics.Mridula asked question to this fact.she was learning towards the table while discussion was going on and sat solidly with support of arm swings.she found answer from Saket and Jalpa .she said O.K. she was agreed	strong	To find active conversation
Greater acces to resources	Mridula introduced the **Copenhegan Summit's** result and indicated how India was leading to the nation towards takings teps about environment pollution.All were listening and were smiling. They felt happy.	strong	To know about Summit's document on pollution
Easily makes relationships	When Saket was narrating certain amazing data and facts,Mridula along with others was listening.she was appreciating his ideas.she was considerate to give examples.she was comfortable with his informations.she developed good disposition towards him.	strong	To develop beliefness on the views
Works in peer tutoring	Deepti informed how CO_2 is synthesized by photosynthesis and Mridula supported to her.Deepti and Mridula understood the need of release of CO_2 and utilization of plants.Saket and Mridula believed healthy metaboliisim process were required to tackle the high population growth.	strong	To get understandin about CO_2
Works well along with a team	Mridula documented the data about vegetation collected from the internet material.she stated that it was 2.7 billion years ago.Deepti said how could it help to form the deep forest.Saket said forest growth affects vegetation.	strong	To find the views on vegetation

Negotiates and compromises with others	Mridula argued that vegetation donot support global warming. There was disagreement with her view points.Mridula requested Saket to focus on this.She had an eye contact towards Saket and Deepti.Deepti narrated how CO_2 helps in vegetation.Saket also convinced each matter through research data and evidences.All clapped after this argument was accepted.		To find the solution
Shows interest in others and exchanges informations	Mridula was silent, grave, looking towards Saket.Her palm was under the cheek.she whishpered about the **Himalayan Glacier and Gangotri glacier** to Deepti.Her words were overlapped with Saket and Deepti.she topl the effect of emission of Green house gases.	strong	To collect nformation on glaciers
Shares her things with others	Mridula shared her views about carbon-dating and decomposition of CO_2 with Saket and Deepti.Saket reasoned out the situation of environment	strong	To find the issue of CO_2
Approaches others easily	In support to Saket's view, Mridula shared her experience on DNA and role of chromosomes towards human body with others.Her hand movement was persuasive to that points.Deepti acknowledged her idea. She smiled and others followed immediately.	strong	To put forth her idea
Asserts her right without hurting others	Mridula expressed to sya about taste and look of vegetables out of her experience. She informed hybrid vegetation and its effect.she narrated the adulteration of vegetables.	strong	to give evidence of adulteration
requests information from Saket	Mridula understood the calculation of emission and uptake of CO_2 and the extent of balance between the two.She made request to Saket to find out the data related to this.she indicated that CO_2 is more .but, how we are existing?	strong	To know the facts on emission and uptake of CO_2
Natural curiosity	Through the knowledge of **Green House gases** its concentration and GWP (global warming potential) was cited by Saket. Mridula was shocked for future times after listening!	strong	To know to save earth
Can please others eaisly	Mridula raised the experiment and said "O.K". She said global warming was increasing .so, the temperature had increased too high.she informed about the efforts of some developed country for experiments with global warming.Saket's view was emphasized by her.	strong	To be aware of global warming through experiments

Ask for clarifications when talking with others	When Saket clarified that CFC was major responsible factor affecting the Ozone layer,Mridula was serious to highlight the issue.There was face to face interaction between Saket and Mridula.Eye contact was moderate in between each other	strong	To exchange the views
Keeps eye contact while talking with others	Mridula was facing towards Deepti to listen her views. There was firm eye contact between each other.Jalpa was smiling. She was attentively listening to Deepti's statement.Mridula was saying about the need of insurance organization affected due to food pollution.All laughed to listen the news.	strong	To highlight her views
Sincerely expresses thanks for the help received	Deepti and Saket described the role of DNA and chromosome towards human being.she said Yes, and expressed thanks to them.	strong	To have meaningful sharing with each other
Starts conversation with ease	Mridula asked Deepti about the problem of global warming.Deepti repeated to say "I had a dream lastnight that clouds were burning" The problem was alarming said Mridula.She asked for all to protect global warming.	strong	To know the alarming situation of warming
Works in peer tutoring	Mridula was arguing about use of plastics.Jalpa added statmements in her explanation. Neelam and Deepti were listening to Mridula.Saket was writing some points from her arguments.Mamata questioned for clarifications	strong	To initiate conversation between the group memebers
Takes active part in group work	Mridula discussed with Deepti about globalization.she asked questions to Saket. Neelam, Jalpa were rubbing and touching their eyes and ears.They appreciated saying OK, and Yes!	strong	To involve all towards issues
Shows interest in others and exchanges information	Acidification of ocean was inquired by Mridula.Deepti clarified one of the cause as carbonic acid.Saket replied O.k. She discussed the PH value of acid and alkaline to know more about carbonic acid.	strong	To find ocean acidifications
Starts conversation with others	Mridula added some points with Saket.she was listening to the sayings of Mamata.Deepti was writing slowly.All joined with others in group conversation.They came simultaneously towards the centre of the group. During this, Mridula took care of points that were presented by other members.	strong	To work collaboratively

Easily makes relationship with Jalpa and Deepti	Mridula informed the role of diatomic position in the formation of oxygen and carbon dioxide (CO_2). She had eye contact with Jalpa .Deepti was looking towards her .she was listening attentively Deepti was close and seated near to Mridula .she kept an eye contact firmly towards Mridula.	strong	To develop inter-personal relationship
Feels happy when she is in a group	When Mridula read out the statement, all were close to each other, listened with curiosity.The presented matters written earlier were looked carefully by every one.Jalpa made finger pointing to agree with those points.Saket and Mridula took care to make these understandable to all.	strong	To find involvement of each in agroup
Negotiates with Deepti	Deepti asked to know the situation through examples of Sulphur containing pollutants. Mridual answered that there was serious effect which caused imbalancement of nature.Jalpa resolved how co_2 could be produced over the sea? She examined and stated aquatic life might be developed. Mriduala contemplated the sequential change from hot to cold in the temperature	strong	To understand the point through group sharing
Asserts her right without hurting others	Mridula and others were disappointed with the grim reality of the society.she questioned about the different types of carbon compounds like CO_2 and CH_4 to Saket.It was intense ground spelled out by Mridula. The reflected ray of sunlight was narrated by her.In this regard , She informed the"Black spot" to the group	strong	To put forth carbon compounds causing "Black spot"
Requests information from Saket and others	Mridula made confusion on how titled rays affected the pole.Saket informed how it affected the pole.The influence on average temperature on earth's surface might be due to rotation of earth.Mridula was convinced by saying of Saket.	strong	To clarify the confusion
Natural curiosity	Mridula presumed that the existence of life after 50 years would be dangerous.$3O^0$ rise in temperature per each year would affect the rainfall pattern.she apprehended about our existence in future! All panic to exist in those periods!	strong	To feel the dangerous situations in near future
Prepare an evidence	Saket informed the issue of "Asian Brown cloud" to all the group members. Mridula asked how could clouds burnt? Jalpa laughed to know the funny facts presented by Saket.she sought clarifications about certain points from Saket. He narrated the scientific reasons and principles related to that. She was accepting his facts.	strong	To find scientific resources on the issues

Shares her things with others	Mridula informed "Black Hole effect" affecting to the ozone layer. Deepti too appreciated her.Jalpa felt the grave situations occurring in Asia.All agreed to that points.All soon said O.k, Yes, han!	strong	To inform about 'Black Hole effect'
Works well along with a team	Saket indicated economic implications due to pollution. Mridula also assured the economic effects were due to pollution.she had firm eye contact towards Saket while she was listening .Jalpa was smiling while listening to her.	strong	To accpt the issue of economic effect
Willingly participates in problem solving	Saket prepared an evidence to illustrate the effect of global warming".Mridula with firm eye contact towards Saket was listening to his facts.	strong	To undertand the effect of economy at peruvian
Joins in conversation with Saket	Saket informed about storm surge **Hurricane at Katrina**.It was due to global warming which made more violent. Mridula listened and astonished to see the danger.She wrote the data of the total damage.she made sincere thanks to him.	strong	To discuss with the effect of Hurricane
Takes active part in group work	While Saket was drawing the picture Mridula suggested to draw scattered figure.she along with Deepti were discussing how to "save earth". She had keen observation towards the diagram.she had an imagination about the cycle of the population and its protection. It was presumeed by Mridula	strong	To contribute in drawing the diagram
Takes things positively	Mridula was silent but all were smiling in a discussed situation.she was sitting silently.She kept her palms under the cheek.she was requesting to complete the tsak. Mridula was observing the drawings.she was concentrating towards the sketch.All were observing with their wide opened eyes	strong	To accept an information with open mind
Works in peer tutoring	When Saket and others were engagaed in drawing the diagram, Mridula gave some tips.she asked to include her concept while making drawings.Saket was agreed to include those points. Mridula and Saket resolved to incorporate such idea into their drawings, Mridula was happy.	strong	To put the ideas
Sincerely expresses thanks for the help received	When the work was going on, Mridula was appreciating the outline. She acknowledged Saket's work and said good.when sketching; she was including the others idea into the diagram. she was smiling while accepting the ideas of others	strong	To find the agreeements on the views and ideas

Greater access to resources	Mridula added the **volacano** case as one of the cause of release of SO2 gas. Mamata and Neelam had repeated the same things to emphasis this.she had firm eye contact towards her.	strong	To know the effect of environment pollution
Sincerely expresses her wishes to others	When Jalpa took back the paper from Saket to show another outline, Mridula said it was fine! She expressed her thanks Mridula also said that it was well understood. When Mamata asked for use of brown colour to sketch the grass in the diagram, Mridula said affirmatively.	strong	The resources were well understood
Asserts her right without hurting others	Mridula suggested showing the areoplane on the diagram. All were laughed at her.All suggested that it would make deformative so it should not be included. It was then appreciated by Mridula. She chose the colour the black for the aeroplane Mamata and Jalpa said Yes, Yes!		To give the ideas for inclusion in the diagram
Starts conversation with ease	Mridula informed different types of calamities like super cyclone, spinal cyclone.The nature of calamities \cyclones were discussed to see how the normal life of man could be disturbed. Mamata and Saket felt seriousness of the calamity of the nature.Deepti even asked about our existence in future could be panic!	strong	To go indepth about the discussion
Can please others easily	Mridual and Deepti were saying O.K towards Saket's view on pollution.she was inquiring the place of Siberia about its location.The effect of global warming in this city was explained by Saket.Similiar example was shared by her .she also compared earthquake situation under sea.It was said O.K ! Ya! Oh! by her.	strong	To know the effect of global warming
Takes active part in group work	Mridula indicated migration as the cause of global warming.she argued about the effect of global warming. She had eye contact towards Jalpa and Saket. Her voice was high pitched.she was narrating. She sat straight with an erect posture. She also informed the economic and finanace conditions affected due to migration.she had cooperation with Jalap's view.	strong	To discuss on migration
Invites peer to join an ongoing activity of the group	Mridula was open and inviting to discuss the matter.she was narrating the matter with eye contct towards Deepti. Her gesture and posture was signifying to the points. Her face was looking easy and comfortable.she was laughing to know the increase of population.	strong	To discuss on population growth

Shares her things with others	Mridula criticised the mass-meida for mis-leading information. She had an argument about the misleading information of media. Jalpa, Saket and others laughed at her.They remarked the true things. The discussion on cyclone forcaste was indicated by Jalpa.Mridula sensitized the population effect.she was saying Ok. Ok! She apprehended the future situation also.	strong	To discuss about the cyclone
Resolves conflicts easily	Deepti, Jalpa and Saket were explaining the reasons of calamity .Jalpa was apprehending the future as more violent .Mridula tried to add more facts to outline a diagram.she also clarified the matters.Deepti and Saket were silent.Mridula thought independently.she tried to collct the common point from all corners .Finally, she resolved towards some agreements.She was leading to conclude the points. The valid suggestions were noted properly.	strong	To find common agreements
Greater access to resources	Mridula underlined the content and read-out silently about the **Kyto protocol** presented in the material.she also asked the formula of CFC .Saket also answered CCL_2 F, CCLF2 etc. through writing the formula.She felt the use of CFC was not environment friendly .she also asked about its alternatives. Saket and others replied Yes, Yes!	strong	To find resources on CFC
Shows interest in others and exchange informations	Mridula was asking why in order to reply Jalpa .Then, she started discussion with Deepti.Her voice was low pitched.she discussed about CFC and its future situation.She was eagerely left her seat to see from the internet.Deepti, Mamata were dictating the statements. Mridula was asking cause and effect of the facts to both Neelam and Deepti .she was also read out the material. Deepti and Mridula were close and seated nearer to each other.	strong	To discuss the effect of the material
Ask for clarification when talking with another	Mridula was asking questions to clarify doubts and points.Mamata too sought to clarify the points.Saket accepted the points.Mridula and others responded saying Yes, Yes! The data given by Saket were validated by Mridula.she smiled to see the data.The referred data shocked to Mridula.Then, the suggestive solution was agreed by all also.	strong	To validate the data on global warming

Works in peer tutoring	Mridula accepted Saket's interesting materials through internet.she said all right! She welcomed Saket and Deepti and told 'let us write the things'. They were ready to note. Jalpa and Mridula were whispering each other on the information collected from the internet.They knew the facts and were informed to each other about the cause of pollution.Mridula along with Deepti shared their view points towards group discussion.Mridula adopted her seat according to the situation	strong	To find solutions of pollution
Shows interest in others and exchanges information	Mridula querried about some points of thermostat .She tried to put her own ideas to find a common agreement.she called together for debate and approval of the learning issues.she questioned whether minor issues need to be rejected. All others were agreed to include the major issues.Mridula argued to write only positive points	strong	To finalise learning issues
Works well along with a team	Mridula started argument and expressed her opinions to the group.Mamata and Deepti both were noting the approved learning issues.Mridula concentrated on the same issues and gave approval for inclusion of the point.Jalpa ,Mamata both were appreciating her suggestions.She expressed thanks for the suggestion received.she was taking the responsibility to write the detailed agreements for the group.There was one-to-one correspondence with others.	strong	
Has abilty to concentrate on the task in hand	Mridula informed the economic considerations to the group. There was laughing to some point by Neelam, Mamata and Mridula.Mridula was accepting Mamata's information related to quality of life.she was very much interested to note those points.	strong	To find the possible solution
Resolves conflicts	Deepti and others were editing the learning issue .Mridula made discussion about the appropriate meanings of the term for inclusion under the learning issues. Saket and Mridula reconciled the two word 'disappearance' and 'disoccurrence' to find appropriate.Lastly, all agreed to use the word 'disoccurrence'.Mridula was writing the solution.She was fast and prompt to write these points.she was clarifying each point before recording on her diary.she was repeating the sentences sometimes,the key words in order to make confirmed.she was confident to do that job.	strong	To resolve the points

Works well along with a team	Mriduala was making interferences with Mamata.she was highlighting the points with repeated questions. She was accepting after the answers were available.Mamata and Jalpa were nodding their head.She was reading loudly.The sentences were readout with clarity and breviety.Mamata was observing what and how the approoved points were recorded by Mridula. Mriduala was also supporting the conversation before writing the points on the diary.	strong	To find cooperation in the work
Takes active part in group-work	Mridula bent down her head to look into the material and her writings.Her seating posture was erect.she was calm and focused towards Neelam. The preparation of summary was done by Mridula.she was conveying to the group what points were included in her summary.Her eyes were normal, calm and focused. She was easy and comfortable to face the arguments.The final compilation was read by Mridula .The points were read sequentially and one after other It was approved by all. She had prepared the final list accordingly.she was thanked by all.	strong	To find out the work activley
Willingly participates in all steps of problem solving	Mridula suggested to take step not to use vehicles in order to stop global warming.Mridula repeated the learning issue to discuss the global warming.Neelam and Mamata were asked questions.Mridula had faced towards them.Mridula asked with courage to show consideration towards her. She exemplified the pollution due to advancement of technology.Mamata and Deepti were smiling.They looked upon Mridula with due respect.	strong	To find solution of pollution
Works in pairs to complete the task	Mridula reflected the release of CO_2 to the environment.she pointed out the effect of old trees and natural process of decaying the objects were helpful towards global warming.Mamata and Mridula discussed about nuclear energy and its effect. She informed the effect of consumption of nuclear energy.Mridula also informed about innovative measures towards global warming shaped in the discovery channel.Mridula noticed the dangerous effect due to nuclear fusion and fission. She was writing the solutions one by one.she asked that nuclear reactions had both positive and negative impacts of global warming.	strong	To know global cause of warming

Invites peer to join an ongoing activity of the group	Mridula readout the material related to pollution.Mamata, Neelam were shocked about environment pollution and explained some examples to that situation.Mridula was nodding her head while listening to them. She illustrated an event that increased the temperature globally.she was curious to inform the group.she smiled.Her palms were open. Her head was inclined forward.she kept her hands flat on the table. She was highly motivated.	strong	To discuss about pollution instances
Has leadership qualities	Mridula was agreed upon views about the effect of CO_2. All noticed the solutions can be possible and feasible.Mridula appreciated saying Good, Good! She said welcome! The agreement points were noted properly.	strong	To find out possible solutions
Joins in conversation with others	Mridula readout the significant sentences from her material to show the petrol causing pollution.she showed her consideration for Mamata.Deeepti agreed to Mridula.Mridula was straight forward to pay attention on the facts. Her facial expression was pleasant.	strong	To know about pollution
Takes active part ingroup work	Mridula suggested writing down typically about CO_2 emission and solutions about the ways of minimizing it.Saket and Jalpa informed some points. She wrote those points in an organized way.she also readout to make persuade to the group.she explained those points which needed further explanation.She had an eye contact towards the members while explaining the things.	strong	To know about CO_2 emission
Greater access to resources	Mridula was doing her job as per the division of labour.she explained the effect of SO_2 causing environment pollution.She indicated a case study to inform the group about CO_2 and its pollution.she reasoned out the conversation of CO_2 to oxygen.she informed CO_2, Ozone, CFC absorbed heat which increased the temperature.she was straight forward and had gesture-posture.she was bold,grave.she kept her palm to strengthen her points and to make sensitive this issue within the group.		To sensitise the issue of rise of temperature
Dignity of labour	Mriduala read out in detail the materials. All were listening. All were collecting and recording informations. Deepti,Jalpa and Saket were drawing some informations from Mridula's readings.The discussion on global pollution was recordered by her.she	strong	To do summary work

	was happy to get the clear views from Saket.She was nodding her head while recording the data. she was comfortable to listen and respond the conversation		
Shares her things with Deepti	Mamata informed about some anticipated effets for reducing the ozone layer.she explained the matter with pointing her fingers.she had eye contact towards Deepti.Deepti was encouraging Mridula by saying Yes,Yes,! Her feedback to Deepti was encouraging.There was noise while conversation was going on. Doubts were asked within the group.Mridula was clarifying all most all doubts raised by both Neelam and Mamata.Saket was too co-operating with Mridula in putting the informations as per the questions of the group.	strong	To find out possible soutions
Shares each other	Deepti was making list of solutions.she was accepting the approval of Mriduala.Mridula was objective in her argument.when she proved her sayings,all were smiled and made clappings.All had eye contact towards Mridula. Once she shared her experience from her daily situations.Saket was interpreting her description.Mridual was sure and confident about the matter.she was slowly and sequentially delevering to the group.	strong	To explain the cases of pollution
Resolves conflict	Mridula was sorting out CO_2 as cooling effect towards rise in atmospheric situation.All were closed near to each other. All were seated with their head bent down, circular to the table.They made general agreements scrutinizing the accepted points.This was the common platform to resolve the solution.All were considering the positive impacts towards population	strong	To determine the possible solutions
Sincerely expresses thanks for the help received	Mridula readout some lines from her materials which was collected from the internet.she was tapping her hand.Mamata clarified the statement which was readout by Mridula. All were saying OK, and nodding their head to those points. All decided to note it down. Mridula informed to write typically about CO_2 emission. Deepti gave feedback to her.	strong	To find common agreement on points
Works in peer tutoring	Mridula with Deepti paired to complete the work.she had eye contact towards Deepti and Jalpa. Mridula wass convincing about biological environment to Deepti and	strong	To discuss together

	Neelam.Deepti had keen observation towards her. She was approaching to accept Mridula's view point. Mridula greeted her feedback.		
Takes active part in group work	Mridula criticise saying "do not allow the point to go naturally".she voiced out of extreme pollution of the world.she was explaining that the "natural world was extremely polluted.it might be out of control".she was irritiaetly saying " the direct beneficiaries of the plant were the destructors" she demanded the oxygen and nitrogen contributing earth's atmosphere	strong	To know the pollution of atmosphere
Has ability to concentrate on the task in hand	Mridula again continued her arguments.Deepti and Jalpa were also supported to her arguments .Her speech was loud and accent was clear.Her eye contact was focused rightly towards the centre of the group.Her face appeared pleasant.she was easily expressing her word .Her left hand was placed on the table.while her right hand was moved to indicate the points through her fingers .The two heads were relaxed.she shifted erectly and her posture was comfortable.	strong	To argue on pollution
Invites peer to join an ongoing activity of the group	Mridula was explaining to Neelam. She was listening with eagerness. She was utterring while She was accepting the matter.She was comfortable to ask questions. Deepti was supportive with Mridula's explanation.she was explaining the diagram. Others were saying O.K, OK! All agreed to note it.	strong	To convey the solutions related to pollution
sincerely expresses thanks for the help received	Mridula supported Deepti's view and appreciated her fact.Jalpa and Saket both were saying Yes, Yes! Neelam said the economic consideration was right.He requested to write on the list of solutions.There was no complain about the list of points. Her eye movement towards Saket was firmly maintained.Her palms were open and head was inclined forward, while he was explaining to the group. The group was silent .She was listing the solutions. The group work was appreciated by all to finalise the solutions.	strong	To maintain the list of the solutions

Checklist Matrix (Dynamics Of Saket's Behaviour)

Behaviours	Examples	How important	Why important
Willingly participates in the step of problem solving	Saket prompted Mridula for loud reading of the problem statement	Basic	The list of known data is to be prepared
Ability to concentrate on the task in hand	Saket tried to explain the cause of increase of carbon number	Basic	The explanation about the change of carbon number to a new mathematical number was understood
joins in conversation with others	He was listening to the conversation of Deepti,Mridula and Mamata	Basic	To understand the significance of the word "carbon's new mathematical number"
Explains others	He explained the rise in temperature was due to increase in carbon dioxide (CO_2)	Very strong	explained the increase in temperature
Joins in team-work with others	He took the task of preparing "learning issues" as per the steps of PBL	strong	'Division of labor ' was implemented to continue team work
Works well along with a team	He examplified a case study that 19% of population in Itly depends on rice cultivation.	adequate	To explain the effect of population growth
Works well along with Neelam	He tried to explain Neelam's question pertaining to increase of CO_2 in the temperature	strong	To visualize CO_2 as responsible to the increase of carbon number
Thought fullness within the group	He was silent and grave for about 1 minute to get idea 'carbon's new mathematical numebr'	adequate	The term "carbon's new mathematical number was considered
Takes active part in group work	He convinced all about how the carbon number is changing through pollutants	strong	To lead the discussion on changing of carbon number
Asserts his right without hurting others	He was in an erect posture to explain examples to maintain warm up discussion	strong	To present the true and valid matters
Keeps eye contact with others	He was maintaining eye-contact to all in a regular manner	strong	To present the truthful topics
Works in peer tutoring	He was eagerly informed the data and issues related to pollution to the group.He explained the formation of glaciers of snow to highlight the current pollution.	strong	To know about glacier effect due to pollution

Resourceful and confidence	Saket explained green house effect through diagram. He was informing about green house gases causing towards pollution.He had firm eye contact towards Deepti and all. He sat in an erect posture and his chest was projected forward. He was speaking slowly with pause .His view point was understood by all.	strong	The view point was true,valid and resourceful
Shares his view with Deepti	He shared his view on green house effect with Deepti to find out the issues of pollution.	basic	To locate green house gases causing issues of pollution
Dignity of labour	He described some evidences to explain the cause of pollution and global warming. It was listened carefully by all. They were interested.	strong	To inform the matter to the group with interest
Confidence and leadership qualities	He was speaking with a high pitched voice, his chest was outward with an erect posture, and sitting near to Mridula.He has maintained firm eye contact to Deepti and others, leaned against the chair.	Very strong	To present the view with truth and precision
Shares his work with Deepti,Mridula and Jalpa	He asked question about thermostat during his explanation to the group. He cited example of 'thermoflask'to explain the principle of thermostat. The discussion was initiated among them.	Very strong	To extend the clarification on 'thermostat'
Greater access to resources	He tried to clarify the effect of the atmoshphere due to increase of CO_2. to He exchanged his information about the mechanism of conversation into CO_2 with Neelam and others	Very strong	To collect the resources on CO_2 and its effect to the atmosphere
Expresses his wishes to Neelam and others	Neelam interacted with his view and all others were silently listening. He wished thank for sharing on the discusion about the cause and effect of carbon dioxide (CO_2).	very strong	To know co-operatively the cause and effect of CO_2
Builds a portfolio of work	He drew the diagram while he was discussing about 'sink of CO_2'.	strong	To get valid resource of diagram
Invites peer to join an ongoing activity of the group	The diagram showing 'sink of CO_2' was substantively drawn by the co-operation of all .Others were following correctly in drawing the diagram on their respective diaries.	Very strong	To draw the diagram
Easily makes relationship	The diagram was drawn by Saket. The contribution towards successful compeleting the diagram developed personal relationship.	Basic	To find relationship while drawing the diagram
works in peer tutoring with all	He tried to explain the new concept about 'sink of CO_2' .Deepti added something in his views. All were eagerly collecting information.Mridula and Jalpa added some texts.Deepti and Mridula clarified about normal seasons.Neelam was appreciating with clapping.Mamata added her view on psychological calendar.	strong	to promote active co-operation

Feels happy when he is in group	Saker clarified the normal seasons of winter, summar and rainy season. All replied that these seasons were normally passed by us.	strong	To interact within the group
Keeps eye contact while talking others	He was explaining the cause and effect of CO_2. Jalpa, Neelam and others listened .They had kept eye contact. He had wide opened eyes while speaking to them. He had firm eye contact frequently round the group, went along with blinking of eyes, and had sparkle in his eyes.	strong	To know the acceptance of view points
Willingly participates in the steps of PBL	He agreed with the group's discussion that "rise in carbon level due to industriliasation and deforestation' could be the learning issue.He had conversation with Deepti and Mridula towards that point.	strong	To list out the learning issue
Negotiates and compromises with the group	In order to simplify the learning issue, he made conversation with Mridula and Deepti. He made two categories of learning issues as major and minor as per the argument of Neelam and others. He said okay to the view points of all.	Strong	To find out the category of learning issue into Major and minor
Extended thinking	He explained about carbonate and Bi carbonate to the group. He told with slow paced voice.His eyes were sparkling .His chest was forward .He sat in an erect posture .His hands were placed backside.Finger tips of both hands were joined together.	Very strong	To explain the topic with confidence
Helps when Neelam was behind in her understanding	He had an eye contact towards Neelam when explaining about carbonate and Bi-carbonate to the group.He answered her question on effect of Bi-carbonate towards pollution.she showed gratitude by saying OKAY' and she was attentive to listen him.	Very strong	To make understandable to Neelam about carbonate and its effect towards pollution
Dignity of labour	He took responsibility to explain the impact of 1^0 celsius temperature rise in the glacier.	very strong	To explain the group about temperature rise in the glacier
Share his work with others	He informed to the group that "A slight increase in surface temperature can adversely affect the world's food production. Mridula, Deepti and Jalpa extended their conversation with Saket on these points.	Very strong	To convince the group about increase in temperature
Keeps eye contact with the members while talking	When he was explaining the effect of rise in temperature, He maintained firm eye contact towards Mridula, Deepti and Jalpa. They were saying 'okay 'in between their conversation .They stayed in tune with the conversation.	Very strong	To convince the view points

Expresses his views to others	He viewed the effects of world food production due to pollution.Mridula, Deepti and Jalpa accepted his views sensitively.They perceived the alarming situation of the environment. The group voiced Oh! Yah! Loudly.	strong	To sensitise the dangerous situation
Shares each other	Deeepti and Mridula added their view points to the explanation of Saket. It extended their discussion.Deepti became sensitive to this situation.Mridula and Jalpa felt the urgent danger of the situation.Neelam and Mamata too joined in the noise.	strong	To extend the discussion with the group members
Take things positively	Jalpa argued global warming as one of the 'learning issue'. Saket along with Mridula supported to this view.Jalpa further considered positive and negative sides of global warming.He suggested to list under possible solution.	strong	To consider the positive and negative points of economic development
Feels happy	Jalpa voluntarily read out the list of 'known data '.She boosted to do this job and then asked Neelam to read the list of 'Needs to know'.Saket said 'okay' and Good' in the course of his listening	Basic	To revise the 'known data' and 'Needs to know'
Greater access to resources	He submitted his collected resourceful material for narration on effects of pollution.The group understood the carbon's new mathematics number from his explanation.He followed the internet and referred magazines for such explanation.	Very strong	To explain the carbon's new mathematics number
Initiated dialogue	The carbon's new mathematics number was argued by all .Deepti argued with fast paced loud voice about its fixed number.Saket was ready to answer that the possibility of its fixed number could not be expected.He was speaking with precision and with no hesitation. He had an erect posture while leaning against the chair.	Very strong	To initiate argument on the concept of carbon number
resolves conflict easily	He was listening the arguments of Neelam,Mamata and Deepti.He was tapping hands on the table.He had eye contact towards them.He was solid and slowly informing the changing number of carbon.The solution on carbon's new mathematics number mentioned in the problem scenario was accepted by all.	Very strong	To find common agreement on carbon's number
Natural curiosity	Saket shared his view with Jalpa. Jalpa put her daily experience in regard to environment pollution. There was support from the group. He informed this view as	aduquate	To share own experience with the group about environment

	unscientific and blind belief. Hence, there was laugh! All clapped. He crossed his fingers and head was forward towards the table.		pollution
Works in peer tutoring	The group's discussion on problem due to rise in temperature was repeated by Saket.He tried to convince the effet of environment to Mamata,Deepti and others.He affirmed to the group on the impact of the global climate.Jalpa was silent and grave to carry out her thinking and accordingly to write that.	Very strong	To provide the justification of the statement
Build up a portfoilio of work	He asserted environment problem was due to rise in temperature. He stated his words in the group.He also informed the rise in temperature through drawing a sketch on the diary.Mridula and others were silently recording.His eye movement was sparkling. He indicated through his hand gesture and his facial expressions was pleasant	Very strong	To explain through visual structure
can please others easily	Saket reasoned out the vapour state of water causing the rise in intemperature. Deepti, Jalpa and Mridula were eager to see the calculation. They were looking up at the ceiling. They were totally facing Saket.They shouted loudly Ha! Ha!	Very strong	To reason out the rise in temperature
Greater access to resources	He informed about rise in sea level which was the effect of global warming. He gave example of Ocean, the reserviour of heat. He informed about rising of the sea level by 2 meter through melting of glaciers, ice cap of Greenland and polar ice caps.His voice was thrilling and his eyes were sparkling.His eye contact was towards Mridula and Deepti.	Very strong	To provide information about global warming
Approaches others confidentially	His information was agreed by all. Querry about the situation was initiated by Mamata and Neelam.He joined finger tips of both hands together while he was informing .His explanation was with high pitched voice.His argument was informative .He was answering Mridula's question.He convinced the facts to Jalpa.	Adequate	To convince the facts to each members of the group
Shows interest and exchanges information with others	Deepti and Mamata were comfortable to accept the answers of Saket.when Deepti was asking 'How' and 'Why' type of questions, he clarified these. Some sample doubts were answered by him. He had eye contact towards them.He was nearer to Mridula.	adequate	To evaluate his information understood by others

Leadership qualities	He informed carbon number would increase even after global emission stopped. His eyes were sparkiling.He had firm eye contact towards Deepti, Jalpa and others. He was speaking with slow paced voice.He had an erect posture.His arms were croseed over the chest.His information and facts were demanding to the cause of global warming.	Very strong	To lead the group with new informations
Resolves conflict	Saket posed a question to the group .If CO_2 increases day by day, and then what would be the situation on the earth? All were alert! One by one tried to open their views.Eyes were seen wildely open. The dangered post effect of increase of CO_2 was spontaneously felt.Mamata and Deepti were listened actively.	Very strong	To know the post effect of increase of CO_2
works in peer tutoring	Saket detected another amazing facts and data in front of the group. All were listening. His data was substantially remarked by Mridula. He had eye contact towards Mamata.Deepti was appreciating his ideas. The information about causes of global warming given by Saket was understood by all. They were smiling. They had good disposititon towards engagement in the discussion.	Very strong	To share the information with understanding
Has ability to concentrate on the task in hand	Saket informed various diseases by virus which could be due to pollution.He replied depletion of Ozone layer to answer her question.He gave vegetation as another case in point of pollution.He had also answer of global warming in response to Deepti,Mamata and Mridula's question.	strong	To initiate dialogue
Greater access to resources	Saket reflected with data base how vegetation was supported by CO_2	strong	To provide evidence of global warming
Takes care of others	Mamata added information about increase in carbon content to inform the rise in carbon.Saket accepted the information and told that sensitized fact.	strong	To add the data to global warming
Shares his things with others	Deepti informed CO_2 synthesized to photosynthesis.Mridula informed the importance of plants for release of CO_2. Saket shared the information about metabolisim process to add with that.	strong	To find the componenets of CO_2
Starts conversation with ease	Mridual argued vegetation did not support global warming .Deepti narrated how CO_2 could help in vegetation.Saket illustrated some data and research facts.He added the data to her explanation. He started conversation with confidence. He proved that pollution could increase vegetation.	strong	To clarify vegetation and its role towards pollution

Resolves conflict easily	Saket resolved the conflict between Mamata, Mridula, Jalpa and Deepti about vegetation.He summarized the comments of vegetation. It was clapped to appreciate the views of Mridula and others.	strong	To resolve contradiction of positive and negative role of vegetation towards pollution
Greater access to resources	Saket informed about Fertilisers of NPK, NPS which were plently used in vegetation.He described CO_2 fertiliser flux which was balancing CO_2 in atmoshphere.	strong	To convince about CO_2 fertiliser flux
Shows interest in others and exchanges information	Saket explained case studies and examples causing environmental pollution. He added resources.	strong	To judge the effect of pollution
Feels happy when he is in a group	He was happy to convey about the case-studies explaining about the pollution	strong	To find the acceptance on his contents
Has leadership qualities	There was silent. No counter arguments were blocked by the members of group towards case-study and examples cited by him.	strong	To find common agreements among the group
Approaches others easily	He narrated another case-study on the effect of global warming. His information about 'Himalayan glacier' was shocked to all.	strong	To know the effect of pollution
Build up a portfolio of work	The case studies \examples were presented by Saket.These events were accepted by all	strong	To collect resources on pollution
Share his work with others	Saket further added topics on pesticides. He explained its use affecting towards pollution.He was straight forward.His eye contact to one and all was firm.He was open to inform the data.His posture was close proximity to others.	strong	To lead the group with resourceful informations
Takes care of others	Saket explained role of vegetation affecting greenery environment in kutch region.It was supported to Mridula.His eye contact to Mridula was firm. All were happy to note the statement.	strong	To accelerate group work
Helps out when one of them gets behind in his work	Saket reasoned out the situation of environment and added factor of photosynthesis responsible for vegetation	strong	To add others concept of photosynthesis
Invites peers to join an ongoing activity of the group	He invited Jalpa and others to see through internet about the idea of splitting of CO_2.It was one of the experiment at California informed by him	strong	To find other's view
Works in peer tutoring	New research trend on RUBP and CO_2 was discussed by Saket .Jalpa agreed that RUBP traps CO_2.Mamata pointed out negative effects of RUBP	strong	To convince others about RUBP and CO_2

Negotiates and compromises with others	Saket answered the beneficial effects of RUBP. He explained no harmful effects of RUBP.This assumption was made by Mamata.He discussed both positive and negative effects of RUBP .It was argued by Mamata, Deepti and Mridula .He responded appropriately to consider that RUBP traps co_2	strong	To respond appropriately
Eassily makes relationships	Saket was questioned by Deepti,Jalpa and Mridula about the effect of RUBP.He was convincing his points with a comparative data.During that time, Mamata's question was also honoured by him.His hand movement was convincing about the points .He was smiled	strong	To develop one's understanding
Joins in conversation with others	Saket informed hybrid vegetation to respond Mamata's view on change of vegetations. Deepti, Mridula and Mamata had their own experiences on vegetation.Saket informed adulteration in relation to vegetataion.He pointed out the issue of CO_2 fertilisation flux.	strong	To share the experiences on vegetation
Prepare an evidence	Saket provided a calculation of emission and uptake of CO_2 and the extent of balance between the two.	strong	To find the percentage of CO_2 in atmosphere
Works well along with a team	He indicated that GWP (Global warming potential), CFC (Choloro Fluro carbon) were impacted by CO_2.All others explained that CO_2 had more power of rate of absorption.	strong	To find understanding about CO_2
Asserts his right without hurting others	Saket provided data related to green house gases representing a chemical reaction as $CFC > N_2O > CH_4 > CO_2$. Also, he displayed the data describing the increase of CO_2 gase per year.Deepti ,Jalpa and others were eagerly listening to him	strong	To demonstrate confidence
Enjoys fun	Deepti querried from Saket for repeating the data.Jalpa ,Mamta,Mridula and Deepti had approved Saket's view with thanks and said very true! .Jalpa was supporting to Deepti's view .Saket was slowly communicating the data towards the group	strong	To know approval from others
Shows interest on others	Mridula and Jalpa pointed out Micro-organisms and its effect to the group.Mridula was conveying fascinating facts about health.Saket explained different situations .He was open and straight forward.He was leaning forward.	strong	To listen actively

Initiate dialogue	Saket explained experiment of Carlifornia of oceanography to measure global warming. The experiment was inquired by Deepti through asking questions .Saket had eye contact towards Deepti and Mridula.Mridula was replying the increase of temperature.Saket had agreement with her view.Deepti told about efforts by developed country for global warming.Mridual and Deepti were seated close to Saket.Hands were flat on the table and palms were open.	strong	To convey the findings of the experiments
Greater access to resources	Saket informed CFC as non-toxic, non-inflamable and miracle chemicals which caused Ozone depletion.He was confident and open to inform the matter. He had eye contact towards Mridula, Deepti and Jalpa.	strong	To know the main cause of ozone depletion
Approaches others easily	Mridula and others had firm eye contact towards Saket. They were refining the view points. There was conversation between Mamata and Saket. There was face to face communication with Deepti, Jalpa and Mamta.	strong	To share with others
Ask for clarification when talking with others	Mamata pointed out different types of diseases caused by pollution.Saket had good listening with eye contact towards Mamata.He was nodding his head and saying Yes' and Ok'! .He was asking about the future earth.He was in peace on positive aspects of Bing-bang theory.	strong	To confirm about the future society
Asserts his right without hurting others	Saket narrated about the science fiction"A dog is singing a song" which might be possible.Deepti, Mridula and Jalpa informed the responsible factor of DNA which could be possible to a dog to sing a song.	strong	To know about DNA
take things positively	Deepti informed her last night dream about "clouds were burning" to the group.She said it was an evidence of global pollution.Saket felt the dangerous effects wer alarming. He took things positively and made promise to protect global warming individually.	strong	To know the dangerous effect of environment pollution
Takes active part in group work	Saket was forward to read the statements about splitting of CO_2.She initiated discussion.All others were participating. He again informed the effect of glacier due to the rise in temperature.	strong	To initiate discussion
Has ability to concentrate on the task in hand	Acidification was discussed in the group. Saket joined in the argument with these points and took up the responsibility to explain Neelam and all. All were with an erect posture sitting straight.	strong	To find the issue of acidification

Negotiates and compromises with others	All joined in conversation with others asynchronisingly. One after one in a normal way, all joined in this discussion.Saket asserted his rights to the group. He declared that cloud density is changed due to global warming.He also reasoned out that water condensation was due to global warming.It was recordered by Neelam and Deepti.	strong	To come to know about cloud density
Invites peer to join an ongoing activity of the group	Saket gave example of Siachen Glacier which is affected by pollution.Neelam was interested to ask question for detailed illustration. Saket appreciated her question and convetyed that "your question is good" .Saket replied to one of question of Neelam related to Bing –Bang theory.	strong	To interact with each other
Easily makes relationship	When Mridula was explaining diatomic position in CO_2 and oxygen.Saket was bent towards left and right of Mridula.He was closer to Mridula	strong	To find same information
Works in peer tutoring	Saket's explanation towards cause-effect relationship was appreciated by Deepti.she had eye contact towards Saket. The approach towards point of explanation was positively accepted by Deepti.	strong	To make one-to-one correspondence on a point
Asserts his rights without hurting others	Saket disappointed with grim reality of the society.He narrated the situation in a high pitched voice.Palms were pointed upwards.He was tapping his hands.He was convincing about the procedure of reflection and centrifugal force to Neelam and others.	strong	To take leadership
Starts conversation with ease	Saket explained how the rays affected the pole .Mridula repeated to ask the statements.He tried to explain the cause.He informed glacier was decreasing due to this effect.	strong	To pose some points in confusion
Keeps eye contact while talking with others	Saket informed 3^0 rises in temperature in the enviornemnt per year.so, rainfall pattern would be changed. Mridula, Deepti and Jalpa asked question about our existence in near future. He had eye contact towards Mridula, Deepti and Jalpa .His eyes were focused, palms werer open with a gesture while convincing to others.	strong	To initiate conversation with such issue
Greater access to resources	Saket presented a case-study \experiment to support the pollution.He was courageous to put the matter.He was paired with Mridula and Deepti to work with the group.He was logically narrating to make understandable to the group. The information was shared by each other.	strong	To know the research trend related to pollution

Works in peer tutoring	Saket asserted that economic progress is affected due to pollution.Jalpa was curious to note the phenomenon.She was also depressed and was pronouncing " Bhagaban varasha"Saket had eye contact towards Jalpa.he clarified the picture of rise of temperature in each year.	strong	To find one-to-one relationship with Jalpa
Shares his work with others	Saket informed rapid shrinking of the Himalayan Glacier which ultimately would affecting global warming.He informed devasted economic and social consequences to the group	strong	To inform new issues to the group
Prepare an evidence	Saket informed Sulphates, Nitrates, Black carbon, Alides and other pollutants which had spread over area of 10 million sq.k.ms. over south Asia. He also informed the reason of formation of such clouds.Neelam was interested to record the data	strong	To analyse the facts
Takes care of others	While Saket was explaining about pollutants, Neelam asked to take pause and be slow to Saket. She also asked how Brown clouds were seen. Saket suggested her to keep patience .He then informed the scientific reasons and arguments on these points.	strong	To approach Neelam's understanding
Resolves conflicts easily	The issue how Brown clouds were seen? It was explained by Saket with the scientific reasons and arguments.Mridula was not accepting .She inquired the scientific principles.Deepti was also trying to explain. Jalpa was accepting the facts.Saket's explanation was systematic. His voice was loud. Posture was erect.He was happy to explain.	strong	To see the belifeness of the group
Asks if he can be of any help to others	Saket informed the cause of diseases .He supported to point out acid rain. He explained it caused all diseases.Jalpa accepted it as the grave concern occurring largely in Asia. Mridula was also serious towards pollution.	strong	To add more to the resources
Has leadership qualities	Possible solutions were readout by Saket. All were agreed to these points positively. They made loud voice, pointed their fingers upward right. All were looking forward .All were laughing and all on sudden there was noise!	strong	To compile the possible solutions
Build up a portfolio of work	The economic implications due to pollution was raised by saket.He confirmed the effects through data base analysis.Neelam and Mamata were very prompt to record these data .Mridula had firm eye contact towards Saket.She was listening to him.	strong	To know the implications of pollution

Can please others easily	Saket continued to narrate "El Nino "phenomenon. He showed the effect of global warming and emission of green house gases.His information was about eastern pacific off Ecuador, peru and northen chile.He drew a diagram.Deepti, Mridula and Jalpa were supplementing to him in listening and recording the information.	strong	To reconcile the points
Prepare an evidence	Saket made mapping to illustrate the effect of global warming. Deepti and Mridula were paired to clarify the steps.Similiary Mamata and Neelam became pired to supplement the points	strong	To form pairs of group
Approaches others easily	Saket validated the points with the support of Deepti. Mridula and others were responding with utterance of words of Un-Hanh! Deepti was nodding her head, sitting on an erect posture and was listening attentively.	strong	To get link with others' ideas
Shows interest towards others and exchange informations	Saket informed about storm surge hurricane named Hurricane Katrina, moving at 140 miles\hr. His narration about the devastation created curiosity to Mridula and all.All were sensitive towards the situation. Jalpa was appreciating Saket's information and made sincere thanks to him.	strong	To inform about case study
Invites peer to join on going activity of the group	Saket told some experiments related to pollution. Some diagrams were drawn showing different situations of pollution by him.Deepti helped in labelling the diagrams.Jalpa changed the key terms used in the diagram Mridula had eye contact towards Jalpa.Neelam was saying O.K to these points.	strong	To discuss about some experiments
Ask if he can be of any help to others	Saket informed to add something to indicate the nuclear reaction in the diagram.It was drawn by Jalpa and supported by the group. The concept of earth's surface was presented in the diagram	strong	To imagine the diagram
Asks others how they are,what they have been doing	When Saket was sketching the diagram, he posed some tips to jalpa for drawing the figure.He had tried to convince Neelam about the concept of the diagram and its structure.	strong	To initiate collaborative work
Enjoys fun	Saket's hypothetical diagram was slowly understood by all .After that, all were smiling .Deepti was laughing .Jalpa was suggesting to show the path of cycle. Deepti gave feedback to Saket	strong	To know the right concept of diagram

Shares each other	There was active co-ordination between Mridula, Mamata and Neelam. They were sitting silently, palms were under the cheek.Saket was accepting Deepti's idea.	strong	To see the acceptance of views
Prepare an evidence	Saket found out the outline of the diagrm. The idea was appreciated by Jalpa.All were seated facing directly towards Saket.Their focus was towards the drawings prepared by Saket.They looked into the drawing sheet to find out the concept.Every part of the diagram was drawn in agreement of others.	strong	To work together
Resolves conflict easily	Saket and Jalpa were checking the concepts whether to include or not.Mridula and Mamata helped to them through providing some tips.Both informed to include their concept while making the drawings.Saket was agreed to these points. Mridula and Mamata were happy and agreed to incorporate the idea into their drawings.	strong	To draw wholistic concepts in the diagram
Enjoys fun	During the work, all put their tiffin on the table and eat together. All were easy and comfortable to involve themselves.	strong	To carry on discussion informal way
Shows interest in others and exchanges informations	Saket replaced his seat with Jalpa and Neelam. The sketch was coloured properly by Mamata and Mridula.Saket sat reverse to Jalpa.He maintained an erect posture. He had an eye contact towards Jalpa. The different part of the diagram was outlined co-operatively.	strong	To find the excitement of memebers
Shares each others with Jalpa	Saket's work was shared by Jalpa.Jalpa kept her seat in reverse to Saket.She maintained an erect posture.she was very fast in her drawings. Both of them were engaged in colouring the same portion of the diagram	strong	To find newness in the work
Has leadership quality	When the group was drawing the different parts of the diagram, Saket took the task of drawing quickly.All members were stayed in tune with Saket. Neelam and Jalpa were observing towards Saket's work.	strong	To make one-to-one involvement of all
Build up a portfolio of work	Saket informed "Asian Brown cloud" occurred due to global warming and emission of green house gases.He informed the event which was occurred in Indian ocean in 1980. He also gave many reasons .He was explaining the risk of drought as well as acid rain.He had leaned against the chair.He was consistent in giving the data. He spoke slowly. Others	strong	To find the green house effects

	were getting time to get things at their end. He showed his gratitude towards them.		
Ask for clarifications when talking with others	'Industrilisaton' causing pollution was pointed by Mamata, Neelam suggested excluding the trees and adding vehicles in the drawing of diagram.Saket asked for clarification to her. He outlined the diagram to show the released vapour from earth.	strong	Negotiation between Neelam and Saket to find the resources
Sincerely expresseses thanks for the help received	Saket's point was perceived by Jalpa, Neelam and Deepti.They were saying OK, and Good! Saket continued his discussion on SO$_2$ to add in his explanation. It was welcome by Jalpa and Deepti.He expressed thanks for the help received.	strong	To understand others with a key point
Can adopt according to the situations	Saket also informed about "Black-Hole" concept.He tried to includethis in the diagram.when Deepti and others suggested to write "No life" Jalpa and Saket said not to write.The conversation wa grave.Saket used red colour to show the danger line where as the yellow colour for dark lining of sunlight.Jalpa took the paper fromSaket to add another concept.Saket accepted her utter. He also appreciated to Jalpa to use a black sheet according to requirement.	strong	To accept others in deciding the points
Greater access o resources	Saket informed 'Larsen B ice shelf on Antarctica' which was coolest place on earth.He narrated the situation with its biological history.He gave the evidence through drawing a diagram.He had eye contact around the group.It was appreciated by all. Others were shocked the grave situation of Antartica. He was straight seated on the chair.His fingers were open and hands were kept on the table comfortably.	strong	To give resource on pollution
Starts conversation with ease	The cause of environment pollution was discussed through a case-study of Antrartica.Mridula and Deepti were stranged and asked how this problem could be covered? Mamata also asked how we could escape from this situation. He suggested finding alternatives.her voice was slow.	strong	To sensitise the pollution issues
Ability to concentrate on the task in hand	Saket further illustrated the ill effects of Volcano situation.His eye contact was towards the group.His eye movement was passing one after another around each members.His posture was erect while explaining the effct.	strong	To understand the effects of pollution

Invites peer to join an ongoing activity of the group	Saket's data pertaining to the effect of global warming was repeated by Jalpa.Mridula with disatification towards natural world told the disturbed situation was due to global warming.Mamata and Deepti were listening to her. Neelam was inquiring the different places of Saiberia and its Location and nature of the city.She also recalled Tsunami for discussion.	strong	To find out cause of pollution
Willingly participate in all steps of problem solving	Saket narrated Tsunami; the event hitting Indian subcontinent.He narrated the situation. He was emotional while saying the event. His voice was frightening to the group. The earthquake causing calamity was violent.The diagram expressing the scientific reason of event was sketched by Saket.Neeam and Jalpa was clarifying their doubts while Saket was outlined the diagram.He read out the flow chart illustrating the reason.All were writing the steps.	strong	To know the effect of Tsunami
Greater access to resources	Saket added his views on Jalpa's narration.He informed pollution was growing which caused global warming. He also viewed that global warming had direct relationship with population growth.He supported migration caused population growth.He sat straight forward with an erect posture, heads were inclined forward. He had firm eye contact towards Jalpa and others while putting his ideas.	strong	To find resources on pollution
Resolves conflict easily	Saket raised the question why migration? Deepti and others supported to him also. His hands were interlocked, arms were placed on the table, and eyes were sparking. He had eye contact with Jalpa while arguing his points.All were listening. During conversation within the group,the argument in support and against to migration was posed .at the end.Saket remarked migration as the cause of population growth . There was common agreement to this point.	strong	To resolve the cause of population growth
Approaches others easily	The discussion on population growth by Deepti, Mridula and Mamata was doubtful. Then, Saket replied the reality to react the situation.He informed the rise in population causing pollution.He also informed about the uncontrolled growth of population. His eye contact towards Jalpa, Mridula was firmly maintained.He had seat close to Jalpa, Mridula and Deepti.	strong	To know the population growth

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Build up a portfolio of work	Saket informed Katarina issue of global warming.He illustrated the case-study of Hurricane Kattrina.He informed that USA scientists had experimented. He planned beforehand to present the case-study within the group.He was aware of the forecasted calamities. He was also apprehended the future situation of the environment.	strong	To know the case study of global warming
Resolves conflict easily	Saket added more facts to Jalpa's views.Both had an argument on those points.Others were also clarifying the matter with Saket.Saket was silentl and independently thinking the matter.After some time there was consensus on these common points. Saket found co-operation from all corner of the members and drew conclusion.He sought some clarifications by asking some questions to the table.He was grave, slow to focus the question.	strong	To find common agreement
Shares his work with others	Saket presented a case-study of 'Kyto protocol'. It was supported by Jalpa and Mamata. In a question of Mamata about formula of CFC, Saket answered the correct formula and said Yes, Yes! The data given by Saket was appreciated by Deepti.Saket was calm, quiet, comfortable and easy.He maintained eye contact towards Deepti.	strong	To convey the case-study of Kyto protocol
Helps out when one of them gets behind in her work	Saket suggested to decrease 50% of use of CFC.He also clarified to the group about the grim situation of the future.Deepti and Jalpa were happy to know the fact.Another querry about the food habit was also clarified by Saket.	strong	To convey the use of CFC
Works in peer tutoring	Saket and Deepti both tried to find futher data .Deepti was interested to learn more and more. When she got the material, she tried to make informed the important lines and statement from the internet.Saket was appreciating Deepti. She supposed it was good. Deepti was adding the role of SO_2 and ammonia towards R (CFC).Saket clarified to Deepti about CFC as the same thing .	strong	To find the internet material
Willingly participates in all steps of problem-solving	Saket attempted to read out some solutions from the reflective diary.It was about global warming.He added his views about population explosion.	strong	To discuss the population explosion
Joins conversation with others	Saket accepted the points raised by Mamata.The data which were given by Saket were validated by Mamata and	strong	To communicate about pollution

	others.Mridula discussed the effect of global warming with reference to data.Saket added environmental situation related to pollution.He told to write the points which were searching from the internet.Neelam was silently observing the diagram of chemical bonding and molecular shape of compounds.Saket explained through drawing its structure.Jalpa and Neelam were clarifying their doubts. Jalpa has also cliarified about chlorine.Saket had a seat close to Jalpa and Mamata.		
Dignity of labour	Saket took responsibility to focus about the learning tasks.The meaning of thermostat was vividily interpreted by him.He included this as a major learning issue.when Mridula indicated positive points to include mutation as another learning issue, Saket clarified and supported to her. He was also agreed to include under major learning issue. Saket was smiling, easy and comfortable to agree upon these points.	strong	To find new major learning issue
Negotiates and compromises with others	Jalpa and Deepti were in conflict whether to add positive and negative points or not.Saket helped to them in making questioning. He clarified the doubts through the previously written documents.He expressed his opinions to the group.Neelam and others were ready to accept the view points of Saket.	strong	To resolve the conflict
Easily makes relationships with Deepti and Jalpa	Saket joined in the conversation with Deepti.He pointed out the strength of the learning issue.Deepti and Jalpa supported him. They appreciated his suggestion.They expressed thanks for the suggestion received.There was smile and clappings in the group.	strong	To find one-one relationship
Shows interest in others and exchanges informations	Saket supported to the illustration of 'EL Nino' effect did by Neelam.He also made conversation on **Katrina Hurricane** effect described by Mamata.He helped to make a decision of the learning issues.He was friendly working. He was helpful and cheerful while talking with them. His face was pleasant.He had an eye contact towards them.	strong	To know the effects causing warming
Prepare an evidence	While Mridula was recording the illustration and decision,Saket was suggesting to correct some words,sentences and points.Mridula and	strong	To prepare evidence of solutions

	Deepti were agreed on those points.Saket was following statements from his reflective diary.He was discussing the points noted before.It was finalized then and there only.		
Asserts his right without hurting others	Saket was asking Jalpa in order to know her agreement.All on sudden, she said Yes loudly! She was smiling and repeated the sentence to give feedback him. He was easy and comfortable in saying to Jalpa.	strong	To understand one's argument
Takes care of others	Saket was accepting the views to find a conclusion.He was relaxed to convey his feelings.He was supporting to Deepti's argument.Mamata and Neelam were pursuing Mridula to write something.He was easy and normal .His eyes were focused towards Deepti and Jalpa .The final readout and solutions were appreciated by Saket.	strong	To find a conclusion
Works in pairs to complete the task	Saket informed about crucial task for disposal of plastics in near future! Jalpa joined with him to discuss the government rule. Both of them were seated face to face.Saket was silent .He kept his hands crossed on the table.when Jalpa was asking ,Saket with open handed accepted to read out the material His armes were vertically placed on the table while the hands were gripping the edge.His posture was erect .His palms of both hands were not in contact with each other.	strong	To discuss on plastics causing warming
Takes active part in group work	Saket put his ideas about the solutions of nuclear energy. He informed about how its use affected to global warming. He had also informed about plasma research, Nuclear fusion and nuclear fission.He discussed the matter clearly and into depth .He shared to narrate further. He was also questioning to the group. He was speaking in high pitched voice; his eye contact to the group was focused.	strong	To discuss different issues of global warming
Access to resources	Saket informed another issue of 'Mahaprayog'. He said about reactions.He also informed how such event increased temperature globally? Mriduala was curious to say and listen to the group.He informed it as the cause of global warming.	strong	To inform the event of 'MahaPrayog'
Starts conversation with ease	Saket started telling some view point about the effect of CO_2. Nuclear fuel and CO_2 were compared in relation to its positive and negative effect.He was appreciating to Mridula saying Good! His	strong	To share with Mridula and Deepti on nuclear fuel

	eye movements were towards Mridula and Deepti.His facial expression was comfortrable. He was prompt to pay attention to the facts.		
Joins in activity with others	Saket joined with Jalpa in searching points from the intertnet. Those points were also summarized by Mrudula & Deepti. When Deepti was recording, Saket was appreciating verbally.They wrote those points in an organized way.Saket was participating in putting his own experience infront of the group. The conversation was going in between Jalpa, Saket and Deepti .Jalpa was saying Yes! Deepti and Mridula all at a time summarized the interpretation.	strong	To collect the material from the internet
Works well along with a team	Saket was informing the pivotal role of india in 'Kyto protocol'. He narrated about global pollution.The interesting and sensitive issues were understood by Jalpa and others.He had reasonable tone and audible to the group.Deepti was giving feedback with OK. And clear!	strong	To convey Kyto-protocol issue
Has leadership qualities	Saket was responding the questions of Jalpa and Deepti.He was able to explain the answer without break The answer was authentic. Threre was one-to-one interaction between Jalpa and Deepti and Saket. His eyes were focused to Jalpa while conversation was going on.He was answering continuously.Jalpa was repeating withn his agreements and confidence.Saket was saying Ok! Deepti encouraged to him verbally.	strong	To study the occurrence of pollution
Ask if he can be of any help to others	Saket joined in discussion about Mridula's information. He was helping Mridula in answering the questions of Neelam and Mamata .He was asking what next? During description of Mridula's experience, he was focusing towards Mridula. He was confident about the informations.	strong	To co-operate in the description of informations
Resolves conflicts easily	The information was available to Neelam and Mamata by Mridula and Saket.All were thoughtful to react the situation. Saket was tried to clear the doubt. All were listening. Solutions towards pollution was resolved by Saket.Saket strongly suggested that nuclear power utilization can check the present situation of pollution.Mamata and others were agreed .Saket repeated the informations	strong	To find possible solutions on pollution

	that were accepted by all. His palms were parallel to the table. Saket had eye contact towards Deepti during recording of those points.		
Can please others easily	Saket spoke with a low and slow pitched voice. He was silent and comfortable. He was leaned against the chair and listening to the description of Jalpa.He considered all the points said by Jalpa.He was open to accept her ideas. He was encouraging to Mriduala and Deepti in conversing with him .Saket was positive.	strong	To find learning issue on CO and CO2
Works well along with a team	Saket had eye concact towards Deepti when he was questioning to her.Saket convinced Deepti to read out the matter. Each point was understood by Saket. He was sensitive to the content while explaining to Mridula and Neelam. Mridula was praising about his content. He was expressing his words easily. She was erectly sat down. His posture was comfortable.	strong	To study pollution through diagram
Shows interest in others and exchange informations	Saket added information for further explanation with Neelam. He wrote the solution from her description .she was curious to record to those points Saket was saying Yes, Yes! This was true! All were relaxed to find a solution. Neelam and Mamata too were comfortable to find such solution. Saket focused towards Neelam and Jalpa.Her eye movement was moderate. He was open to participate with Neelam's information.	strong	To find solution related to charcoal
share his things with others	Saket started giving information about plant science to relate with Ayurvedic study .He explained a success story about the nature. The balance of nature was understood. Mridula was appreciating with saying Yes! He also informed another solution related to Alge'. The tentative solution was written by Mridula. The group was silent! His eye movement was round the group. His palms were open and had inclined forward while explaining the group.	strong	To know the role of plant science towards pollution
feels happy when he is in a group	Saket was able to explain. He said Yes, Yes! in order to explain the doubt of Jalpa and Mridula. The group was anxious to listen his explanation.The solution was read out and repeated to finalise. His experiences relevant to pollution was appreciated by Deepti and Mridula.Saket smiled .He was happy.	strong	To find possible solution

Checklist Matrix (Dynamics Of Deepti's Behaviour)

Behaviours	Examples	How important	Why important
Willingly participates in the step of problem-solving	She was silently looking towards Mridula.she put her palm below the cheek, listening the statements while loud reading was going on.she was nodding her head and saing Haa! Haa!	strong	Loud reading of the problem statement to find out known data
Ability to concentrate on the task in hand	She was inclined forward in finding the statement from the diary.she was following word by word to locate the data during loud reading. she was also silently reading with parallel to the loud reading.	strong	To locate the known data and in the problem statement
Joins in conversation with Mamata	Deepti was explaining about the frequent change of carbon number. She had an eye contact towards Mamata.She tried to prove the carbon number became new.Her palm was open. Mamata was supporting her view and said loudly about the increase of number. It was accepted by both.	strong	It was needed explanation to find out the importance of the statement
Joins in team work with others	She took the responsibility of preparing the "learning issues' as per the steps of PBL.	strong	Distribution of work among the members to continue team work
Works well along with a team	Deepti pointed out "green house effect" as the main reason to bring out new carbon number	strong	To explain the green house effect to the group
Works well along with Mamata	She supported Mamata's explanation about the cause of nuclear weapons towards change of the carbon number.	strong	To identify the effect of nuclear weapons
Works well along with Mridula	She presented along with mridula the evidence of cause of nuclear weapon which change the carbon's new number	strong	To identify similar effect of nuclear weapons
Thoughtfulness within the group	She was vey much silentand grave to consider the term of carbon's new number	strong	To know about the mathematics number of carbon
Takes active part in group work	She was accepting Saket's explanation by saying Yes,Yes! She was repeating the statements.	strong	To know the cause and effect of pollution
Shows interest in others and exchange informations	She was excited to support the key statements of Saket.Her body movement was energized .she addedd some explanation to his view for further clarificatinon.	S trong	To make discussion about the cause of pollution
Shows interest on Saket's view	She was interested to write the data extracted from Saket's explanation.She was easy and comfortable ,smiling.She was recording in her diary.	strong	Toemphasis the current situation of pollution

Takes care of Jalpa	She was suggesting to Jalpa what was to be recordred under the heading "Need to know"	strong	To facilitatte group work as per division of labour
Starts Conversation with ease with Saket	She surprised to learn CH4 (Methane) affected 19% towards green house effect. Hence,she questioned to Saket to clarify . Her conversation was based on increase of amount of CO_2 on earth's surface. She explained that it made imbalance and caused global warming.she was very serious and grave. She had low pitched voice while discussing on the point.	strong	To know thwe green house effeet towards global warming
Shares each others	She was suggested by Jalpa to write "thermostat" as learning issue.But, she said it was doubtful and needed clarification.So it should be listed under " Need to know" and she informed Jalpa to write this as part of her responsibility.	strong	To find out the importance of word "thermostat"
shows interest and exchanges informations with Jalpa	She informed to Jalpa that civilisation was meant as modernisation	strong	To know about modernisation
Shows exchange informations to Saket	In Saket's explanation about the cause of pollution and global warming, she was listening sincerely. She had no hesitation. She sat opposite to Saket. She was Easy and simple .	strong	To explain the cause of pollution
Shares with Saket	She spoke the concept of thermostat while Saket was explaining. She shared her view through giving example of themroflask's working principles .It was related to thermostat.	strong	To explain and clarify thermostat.
Takes active part in group work	She together with Jalpa interacted with Saket to clarify the effect of increase of CO_2 in the atmoshphere.	strong	To clarify the effect of CO_2
Sincerely appreciates and express thanks for the help received.	She had eye contact towards Saket while Saket was explaining.she was attentive and verbally pronouncing Yaah! She was stimulated.she expressed thanks to receive ideas .	strong	To realise the interaction .
Shows more open to agree with Saket	She added her texts towards the discussion made by Saket.Her hands were flat on the table and palms were open. she was nodding her head.	strong	To emphasis the toipc of CO_2
Share ideas with Saket and Mridula	She clarified about normal seasons passed by us along with Saket and Mridula	strong	To clarify the term "psychological calendar"
Negotiates and compromises with others	Deepti moved up to clarify the list of learning issues in front of all. She convinced to the group about the issue of	strong	To confirm the causes of rise in carbon level.

	rise in carbon level. She proved that it was due to industriliasation and deforestation.Jalpa ,Neelam and others argued to write any one of the two.Saket and Deepti both made discussion to derive some valid points. Accordingly the group was convinced by Deepti to accept the issue of deforestation.		
Share work with Mridula and others.	She shared her view with Mridula to mention the points under the learnin issues .Saket and Mridula made getting to Deepti's view. They decided to take major and minor issues .she was comfortable and strong to explain view points to Saket and Mridula.	strong	To find out the learning issue
Starts conversation with ease	She staretd her conversation with Saket and Mridula to find the consequence of learning issues. Neelam and Mamata were listening to record those points.	strong	To know the learning issues
Access to resources	Saket explained about carbonate and bicarbonate which caused pollution .Deepti realised how carbonic acid increased in oceans resulting pollution. His resourceful material was ditributed among the members for reference.	strong	To realise the role of carbonic acid towards pollution
Natural curiosity	She was astonished to listen Saket's statement.A slight increase in surface temperature say 1^0 C could adversely affect the world food production. She felt the alraming situation of the enviornemnt!	strong	To sensitise the dangereous situation of the enviornment
Works in peer tutoring	She thanked to Saket's information about the precarious situation of the enviornment.she became sensitive to discuss with Mridula and Jalpa.Neelam and Mamata remained silent .All on sudden they thought over the matter.	strong	To find the views of all towards this situation
Works in pair with mridula	She approached towards Mridula to make discussions on economic development.she supported her view on global warming.Mridula also accepted to list out under learning issues.	strong	To find common point objectively.
Active listening	Jalpa read out boldly the list of known data.She was listening with an eye contact towards jalpa.she was saying 'that was true' and 'okay' when the conversation was going on.she was attentive .she was slow to ask the steps of PBL to Jalpa.	strong	To know the list of 'known-data ' and 'Needs to know'.
Ask for clarification when talking with others	Deepti was anxious to listen about informations of pollution from Saket.she was unknown to such informations.she asked for clarification from the group.The researcher suggested to find references on the doubtful matter.	strong	To know some effects of pollution

Initiated dialogue	Saket's information about carbon's new mathematics number was argued by Deepti.she questioned how it could be fixed number? He then replied the posibility of fixed number is doubtful.	strong	To discuss about Carbon's new mathematics number
Asserts his right without hurting others	The statement of carbon's new mathematics number was underlined by her.she demanded that always carbon number was changing. She emphasised that the changing numbercould be mathematical magic.so, it was rightly mentioned in the problem scenario. Deepti in formed and it was open by all. She said Okay!	strong	To know the change of carbon number
Resolves conflicts easily.	She put her palm below the chin.She asked for the validity of the statement of carbon's new mathematics number.Neelam and others were ready in accepting the ideas. The group concluded that "the carbon number would never be constant" .she was smiling frequently and showed responsibility.	strong	To resolve about carbon number
Easily makes relationships	Some daily experience was cited by Jalpa.Deepti was facing towards Jalpa.she was eager to listen .Both of the seats were close to each other.she was staying in tune with the experiences shared by her.She praised her with Good!	strong	To resolve the situation with satisfaction
Joins in team work with others	While Mridula was explaining,Deepti together with Mamata and Jalpa were close to each other . Deepti was justifying the statement of Mridula through text reading .she was interested to calculate the rise in temperature.	strong	To initiate discussion about the issue of rise in temperature
Ask for clarifications when talking with others	She sought questions about melt of glaciers to the group.	strong	To get deep idea on cause of rise in temperature.
Shows interest on others	She raised the voice to see the future shock and dangereous situations in future.she was listening to Saket's view.Her eye contact was firm.	strong	To resist the situation
Starts conversation with others	Deepti querried about facts to accept Saket's view.she was supporting his views.she was presenting her ideas to add to his resources.	strong	To find ideas about the topic
Scientific outlook	She informed Copenhegan summit result and emphasised the role of India towards checking pollution	strong	To know the global pollutants
Share work with others	The enviornment pollution and its causes towards global warming were discussed by Saket.Deepti shared with an example to inform the fact of global warmimg	strong	To find the case of global warming

Greater access to resources	She talked about CFC (chloro fluro carbon) as the cause of pollution. She informed frequent use of air conditioner and other equipements.She explained the facts.she was listing out the source of pollutants and pollution. The data of release of CO_2 was also recorderd . The rise of temperature affecting to the temperature was also known.	strong	To list out the source of pollution
Prepares an evidence	She informed CO_2 was synthesised to photosynthesis.He further explained that utilisation of plants were needed for release CO_2.	strong	To detail out increase or decrease of CO2.
Resolves conflict easily	Whether vegetation supportes global warming or not was debated.Deepti was confused to find the meaning of vegetation.she presented some facts about forest growth to discuss about vegetation. Her hand was gripped the other arm and hand, Feet was tapping and she was speaking in a high pitched voice.she was also stuttering .she often was clearing her throat.	strong	To clear the doubt on vegetation
Initiate dialogue	She narrated how CO_2 helps in vegetation.In support to Deepti's view,Saket and others were also put their views. The contradiction about the views were clarified by Saket. The information was repeated by Mridula . The feedback was also given by Mamata and clapped by Mridula to appreciate her.	strong	To communicate and exchange the views on vegetation
Sincereely thanks to Saket	Deepti expressed her thanks to Saket by knowing the CO_2 fertiliser flux. She was analysing the fertiliser flux. .she understood the role in balancing CO_2 in atmosphere.she was smiling.she clapped her hands.	strong	To know about CO_2 fertiliser flux.
Has ability to concentrate on the task in hand	The case-study on Himalayan Glacier was thought by Deepti.Her palm was under the cheek. All were adding their views to her points when she was saying .	strong	To share with view points and accept to that extent
Joins in activities with others	Jalpa and Saket when took responsibiltiy to find posititon of carbon due to fossil fuel through internet,Deepti raised questions related to it.	strong	To initiate co-operative work
Shows interest in others and exchange informations	Saket was explaining research trend on RUBP and CO_2 causing the diseases.Deepti shared her information which could act as catalyst .she informed the catalytic role of enzyme in diseases.	strong	To respond appropriately

Works in pairs with Saket to complete the task	Saket's information was about role of DNA and chromosomes towards human being.Deepti raised a question for clarification.She was easy and comfortable to respond honestly.Her conversation was pleasant.	strong	To share with the point
Approaches others easily	Deepti acknowledged Mridula's ideas with ease.she was following her. She was smiling in this situation. She was indicating fingers towards her.	strong	To create interest
Joins in conversation with others	Jalpa Informed about Change in vegetation.Deepti raised a question on the effect of hybrid vegetation towards human body. All others too shared their experiences about the vegetables	strong	To get clear about the term
Shows interest in others and exchanges informations	Saket informed the calculation of emission and uptake of CO_2 and the extent of balance between the two.Deepti was noting the data and in the meantime she informed the cause of deforestation.she was frequently using the data and reading loudly.she asked question for realisation of the situation.she tried to communicate the data within the group.It was discussed by Saket.She came out the points raised by both Saket and Jalpa.	strong	To develop awareness towards the data
Please others easily	A revision and appreciation about to what extent the topic was analysed was done by Deepti, Saket and Jalpa.All smiled .They were happy and were conveying thanks to each other.	strong	To find active involvement
Starts conversation with ease	Deepti was inquiring about the experiment through asking questions .she had eye contact towards Saket and Mridula.She had appreciation of Saket's information by saying O.K.	strong	To initiate dialogue
Asserts his right without hurting others	Deepti told about the efforts of developed country.she told experiments related to global warming.All were free to express their opinions.	strong	To find co-operation
Resolves conflict easily	Saket's clarification on CFC to the effect of Ozone layer was reflected by Deepti and Mridula.Deepti was pointing her fingers of right hand towards Mridula and Saket to highlight the points.Deepti had firm eye contact towards others.Mridula was smiling and attentive to Deepti's statement	strong	To find common agreement to that point
Keeps eye contact while talking with others	Deepti had eye contact towards the group to convey about unknown diseases .she informed the group that 2012 would be danger to society. The future shock was disbelieved by all.	strong	To pass message about future shock

Take things positively	Projects for controlling global warming would be allowed informed Deepti to others .she denied the destructive attitude of experts.she informed some views on fiction to crete positive attitude to that topic.	strong	To know the emotional feelings
Feels happy when she is in a group	Deepti informed about her dream that "clouds are burning" .she explained the impact was due to global warming.she repeated to say "I had seen the dream." In response to the statement, Deepti, Mridula, Mamata and Neelam all together made a promise to protect global warmimg.	strong	To find acceptance of her view
Requests information from others	When Mamata asked the tropical region of world, Deepti was rubbing and touching her eyes and ears.for a few minute, she was silent.she was convinced about Saket's narration.	strong	To clear the doubt
Shares work with Mridula	She was discussing with Mridula about globalisation.she also informed positive effects of global warming.	strong	To co-operate with others
Ask for clarifications when talking with others	Deepti asked for help from Saket to know positive effects of global warming.Saket explained the situation of temperature and glacier relationships.He said the rise in temperture was out of prediction.she appreciated the view and said O.K and Good.!	strong	To know effect of global warming
Requests information from others	Deepti had question to Saket about Fossil fuel combustion.she had eye contact towards Saket. The view points were apreciated by Deepti and all.Deepti was writing slowly.	strong	To work collaboratively
Approaches others easily	Cloud density was changed due to global warming.Deepti convinced to Saket about this.Jalpa was listening to her.Saket answered water condensation might be the reason.Mridula and Deepti were inquiring about the reply of Saket.	strong	To collaborate and co-operate
Takes active part in group work	Deepti read out information about water acidification and soil acidification.Saket cited eample of Siachen glacier to narrate the problem. When Neelam was trying to ask question, Deepti encouraged to her.Neelam in answering to aquestion of Mamata explained reflection-absorption method to undrstand those points.Deepti informed about CO_2 in response to her answer.	strong	To find active participation towards solution of the pollution

Easily makes relationships	Deepti was interested towards Mridula's view.she sat nearer to her. She kept eye contact firmly towards Mridula.she was listening attentively on diatomic positon in the formation of oxygen and carbon dioxide.	strong	To exchange one to one view
Joins in conversation with others	Mamata shared her views with mridula .Jalpa made finger pointing to agree with the views of Mridula .Deepti was highlighting which was interested to her. She asked Mridula to read out and present the points .she was saying ok. She was actively listening. she expressed her thanks to Mridula.	strong	To find intimacy with Mridula
Willingly particiaptes in problem solving	Deepti explained some mechanism of carbon occurred in the enviornment .Saket took care to refine for further understanding.she took active part in reading the statement ,searching the cause-effect relationship between points to the group.she had eye contact towards Saket.	strong	To initiate dialogue
Joins in conversation with others	Deepti presented some examples on shulphur.she explained the imbalance of nature.Jalpa said o.k! She also questioned how CO_2 is produced over the sea? Deepti agreed to say that the rise of temperature was going from hot to cold.	strong	To share experience
Works in pair to complete the task.	Saket informed "Black spot' and 'Black hole' towards current isssues.Deepti sought clarification from Mridula.when Mridula was able to explain her, She was relaxed out of understanding.	strong	To clarify the information
Shows interest in others and exchange informations	Saket informed there was 30^0 rise in temperature in atmoshphere.All on sudden Deepti querried about our existence in near future. Mridula told about cooling effect where as Deepti informed about warming effect which would be more and more .Saket shared with them.Deepti further explained the pre-carious situation of the enviornment.	strong	To feel the pre carious situation of the enviornment.
Requests information from others	Deepti requested to know from Saket about some research trend. Saket illustrated about future shock. Saket's narration was encouraging among the group. During explanation,Mridula and Deepti were paired and were more approachable towards the discussion	strong	To create a value system
Joins in activities with others	Neelam was recording the data related to 'Asian Brown cloud'.Saket informed the issue to each within the group. Deepti	strong	To know some facts and illusions

	asked cloud was moving .she also requested to Mridula to comment.Mridula commented how cloud was burning? Jalpa laughed when cloud would vanish? It was fun.		
Does express her wishes to others	Deepti agreed that Ozone caused "Black Hole effect". Possible solutions were readout by Saket.She narrated agreements with loud voice, pointing their fingers upward.All said o.k, Yes, YYAN! There was noise for a while.	strong	To know 'Black Hole'
Approaches others easily	Saket's continuation to validate the content on effect of global warming was listened by Deepti.She was nodding her head, sitting erectly.she was listening attentively.	strong	To respond others
Ask for clarifications when talking with others	In order to Sketch the diagram, Deepti suggested showing the grass in green colour.she asked amid the work to think about 'save earth'. The earth's situation was discussed among the group.	strong	To know the earth's situation
Works in pairs with Mridula to Complete the task.	An imagination about the cycle of pollution and its protection was sketched by Saket.Deepti guessed and tried to ask Mridula .Saket's hypothetical diagram was slowly understood by all.All were smiling.Deepti was also smiling.she was talking something to Jalpa.	strong	To understand the diagram
Works well along with the team	Deepti agreed to Saket's view on the sketch of diagram.she was excited to find full scape size diagram.She was smiling.she was closer to the seat of Saket and Jalpa.she leaned against the chair while viewing the diagram .she was also praising Saket's idea on that.	strong	To understand the diagram
Shows interest in Jalpa's work	Deepti helped Jalpa in drawing the diagram .she put some concept to add in her diagram. Jalpa was agreed to her. She gave appreciation her in the involvement of the drawings.	strong	To complete the diagram in a meaningful way
Feels happy when she is in a group	Deepti repeated the matter of drawings through her naration.she refined the same through some sketch.she was smiling.she kept her palm under the chin.Her ideas were accepted. she was easy and comfortable to listen others	strong	To find her involvement in the group.
Joins in conversation with others	Deepti made clarifications on diagram of the enviornment. The different composition of earth's environment was explained by her. Mridula was sensing the situation for the future society.Deepti and Mamata both made one-to-one talk with respect to its effect.	strong	To findout the efects of pollution

Shares his things with others	Deepti made her keen observation to the diagram.She inquired into the concept upon which the digram was outlined.she praised saying Good. She was upright.she had open posture.she was pleasant and there was easy expression .she asked questions to Saket and Jalpa to clarify certain points.	strong	To refine the concept more and more clear.
Asserts her right without hurting others.	Deepti perceived the Black-hole effect and speculated no life in future.The group was silent and grave to shock the future.Her voice was in reasonable tone. There was firm eye to eye contact towards Jalpa	strong	To sensitize the issue of 'no life'
Build up a portfolio of work	Deepti mentioned case-study pertaining to the effect of global warming.she referred in response to Jalpa's explanation. She informed the occurrence of 'atom Bomb' as the reason of environment pollution.she explained about the dangerous devastation to all. She was inclined forward and noding her head. She had firm eye contact towards Saket and Mridula.she had placed her hands above the table and Palms were open.	strong	To inform the effect of global warming
Initiate dalogue	Deepti supported Mridula's oral talk on global warming and migration.she added resources which cause migration. In order to avoid the disagreements, she pointed the economic conditions affected the living condition and hence migration.she put some leading questions to draw informations.she spoke with a low pitched and slow-placed voice,Her posture was straight forward.Her arms were vertically placed on the table. Her eyes were blinking constantly.	strong	To find out possible solutions of global pollution
Resolves conflict easily	The doubt on migration was differing between Deepti and Saket. Th argument led to dicuss the population growth .she emphaised that population growth led to migration and hence towards global waming.she put her palm below the chin and her index finger was pointed and extended along the cheek	strong	To find out possible effect of pollution
Prepare an evidence	Deepti informed the scientific reasons of global warming.she explained the facts with logical relationship between CO_2 and water. She maintained eye contact towards the group.Her voice was low pitched and slow paced.Her posture was straight forward.she sat to the reverse of Saket, Jalpa and Mridula.	strong	To inform the facts to the group.

Sincerely expresses thanks for the help received.	Deepti listened the matter narrated by Mridula .she had eye contact towards her.she was open, easy and smiled with low voice.she was sensing the situation and said Oh! , Oh! She was astonished and told how could it be possible? She was happy and expressed her thanks to mridula, Saket and Mamata .She informed about the interesting information of Mridula.	strong	To sense the situation
Access to resources	Deepti remarked the advantage of news channel about cyclone.she also put a case-study-Hurricane Katrina,describing global warming.Jalpa was glad about the situation.Saket's view was also appreciated by her.she had discussion with Mridula and Jalpa.She sat in rverse to the back of the chair which served as their support.Saket and others clapped their hands to accept their views.	strong	To show some evidence of global pollution.
Build up a portfolio of work	Deepti demanded further information about the Kyto protocol from Mridula and Mamata.she sat in reverse to them. Her arms were crossed over the chest.she leaned back with both hands supporting the head.Her head was titled forward.	strong	To know the instance of global warming.
Negotiates and compromises with others	Deepti questioned about the composition of R12.Mridula found data of CFC in relation to Ozone layer.she knew the formula of CFC and smiled and said O.K,OK !.Her argument on role of CFC and formula was inquisitive. She was stroking her chin.	strong	To clear the doubt
works in peer-tutoring	Deepti asked Mridula about the classification.Mridula discussed with her.Deepti recorded the key points while conversation was going on.she had firm eye contact with Mridula.she had an erect posture.Her voice was slow.she was eager to ask about the abbreviation of R. she was interested to find out the facts for her.She found data with the help of Saket. Mamata appreciated her in getting the data.Deepti said Good!	strong	To find one-to –one relationship with Mridula
Starts conversation with ease	Deepti informed that more toxic chemicals were being used which threatened our climate. She was highly motivated. Her hands were flat on the table.Her palms were open.Her head was inclined forward.Her eyes were wide opened.some facts explained by Mamata was also communicated by her.while explining, the cause and effect of the facts were communicated by her.	strong	To explain in detail about the role of R_{12}

Ask for clarifications when talking with Saket.	Deepti was seeking some clarifications about the mechanism of chemical reaction.Saket was quickly analysing the reactions. Deepti was happy.She expressed thanks him.she sat erectly, leaned against the chair. She had eye contact towards Saket. After clarifications she scanned some chemical reactions of fertilisation flux and global warming.	strong	To know the chemical reactions resulting pollution
Approaches others easily	Deepti collected the material and read out to highlight the significant lines of the writings. The possible solutions were pointed out. She had eye contact towards Jalpa.She had an erect posture.The suggestive solutions were listened by her. She sat nearer to Saket and Mridula.she listened with an eye contact.she was attentive. she stayed in tune while the conversation was going on.	strong	To read out the possible solutions
Easily makes relationships	Deepti was searching some facts from internet.Mridula and Saket were noting those points. They were agreed with her materials and said all right! They agreed to write those. While Deepti was viewing the screen of computer, all others gradually joined to see the matters. There was preparation of summary also. All were standing with joining their arms during screen view.	strong	To develop inter-personal relationship.
Ask for clarifications when talking with others.	Deepti further influenced about the meaning of thermostat.Jalpa and others were clarifying the word. Deepti was trying to finalise the learning issues by the review of others.She asked Mridula, Neelam and Mamata to put their ideas to find a common agreement. She also again raised the learning issue of vegetation to take common agreements from the group. She was accepting the common points. she was questionning to accept the minor issues.	strong	To find the meaning of thermostat
Takes care of others	Deepti focused about mutation to explain and clarify to Neelam .some pictures were drawn.Neelam was saying O.K, O.K! Deepti was emphasing mutation for discussion.Neelam thanked to Deepti in getting her points.she was smiled.	strong	To accept other's views to discuss the learning issues.
Shares his things with others	Deepti addedd negative effects of mutation to the discussion. She also questioned to Saket about this. Jalpa and Deepti argued whetherr to include the positive and negative points or not. Mridula was putting to include the points. Jalpa was supporting to her.	strong	To share ides on mutation

Works well along with a team	Deeepti pointed the economic dimensions of global warming.Jalpa indicated the result of historical monuments due to pollution.Deepti informed the cause occurred through carbonic form of chemical reaction. She had an eye contact towards Neelam while explaining the points.She asserted the inclusion of the points under the headings of learning issue without hurting others.	strong	To know the effects of pollution
Works in peer tutoring with Saket	Deepti informed the group about the pollutants.she had an eye contact towards Saket.Saket was also supporting to her points and suggested to write those points. Deepti was nodding her head. Saket considered economics club in his suggestion.Deepti was excited to give her experience .All were also agreed to accept the same.	strong	To share knowldege on pollutants
Joins in conversation with others	Deepti informed population explosion and global warming towards the cause-effect relationship.she informed "Tusanami effect" to consider as learning issue.she along with Mamata edited the discussed event in detail to mention under 'learning issue'	strong	To prepare "learning issue"
Joins in team work with others	Deepti joined with Jalpa to make interpretations.Jalpa was noding her head.Deepti made the repeatation of sentences. She was reading loudly.The sentences were read out with clarity and breviety.All were accepted the things. There was overalll agreement on these points.	strong	To seek co-operation
Negotiates and compromises with others.	Deepti started her discussion with Jalpa. Mamata and Neelam were listening to Deepti's conversation.when the the point was finalising by Mridula,Deeepti joined in confirmation of the same .She was inquiring about the use of some words in the sentence.Neelam was supporting to Deepti's argument.Deepti was also accepting Mridula's statement.she also confirmed through reading Mridula's notebook. She helped Mridula and Jalpa in getting the matters quickly. The approved points were emphasised and a list was prepared accordingly.	strong	To resolve summary points
Initiate dialogue	Deepti raised her voice to know the learning issues.she was asking to Mridula to findout the issues. Deepti has eye contact towards Mridula .Neelam and	strong	To convey global situation to others

	Mamata were faced towards situation.Global situation was realised by Saket.Deepti was identifying her point verbally.Her posture was firm. She was explaining her ideas.Her information was based on her experience.Mridula appreciated Deepti's statements.		
Enjoys fun	Deepti had active eye contact towards Mridula .Her hands were open, palms were open.Mridula was interacting actively with Deepti's statement.All were nodding their head to show their agreemnt.	strong	To be open during discussion on vehicles.
Dignity of labour	When Mamata and Mridula were discussing about nuclear energy.Deepti was explaining its effect. She was deriving its solution. The solution was highlighted by her.	strong	To find the role in the group
Easily makes relationship with Jalpa	Deepti made conversation with Jalpa to know the effects of pollution.Deepti logically argued to know the effect.she sat erectly .she was friendly with Jalpa.It was agreed by Jalpa. It was agreed by Jalpa and others.Saket too supported to her.	strong	To converse the effects of pollution
Works in pairs to complete the task	Deepti and Mamata were smiling during the conversation.Both discussed about the effect of CO_2 and nuclear fuel.Both were comparing the positive and negative effects of nuclear fuel. Both noticed the possible solutions.Deepti was writing through confirmation of the points by the group.	strong	To know the effect of CO_2
Requests information from mridula	Deepti agreed with the view points read by Mridula.She believed a nurturing enviornment free from pollution. She informed this experience to the group. She was looking right into her eyes.she was straight-forward.Deepti kept her hands relaxed on the table,had eye contact towards Mridula.Her facial expression was pleasant.All others were also listening.	strong	To find the information on pollution
Takes care of others	Deepti appreciated Mridula by saying 'Exactly'.She explained Neelam about this effect.Neelam was smiling after understanding this point.She accepted her explanation.Deepti was also inquiring Jalpa in order to include some points.	strong	To discuss on CO_2 emission
Shows interest on others	When Neelam was explainng the statements, Deepti had eye contact towards her. She was repeating the staements to reflect the points.She was	strong	To find the effects of enviornment

	listening the explanation on effect of SO_2 and CO_2 as the pollutant done by Mridula.Deepti was inferring some conclusions from Mridula's explanation		
Shows interest in others and exchanges informations	Deepti joined in Jalpa's explanation by asking questions.She had eye contact towards her.Jalpa was also answering to her question.There was one-to-one interaction between them through questionning. The questions were related to occurrences of pollution. The answers were concurrent.Deepti repeated the answers.	strong	To frame questions on occurrence of pollution
Shares her things with others	Deepti was encouraging Mridula about her explanation on Ozone layer.She was putting her arguments in order to obtain some results.she made a list of solutions. She was accepting the approval of Mridula about question-answer of the group. The answers were inter-related and overlapped from each other.	strong	To include Ozone effect in the solution
Resolves easily	Deepti articulated the positive effects of CO_2 to the enviornment.Her voice was modulated gradually.Her hands were open, posture was convincing.Her eye contact was focused.She was nodding her head. She was leaned forward .she was loudly repeating the points.Mamata and others were excited to accept.she had also conversation with these points with Jalpa.Her effort was praised by all.	strong	To discuss the cooling effect of CO_2
Shows interest in others and exchanges informations	Deepti was making note of the sequence of materials.she interacted with Jalpa about Bio-gas.She was pointing the use of CO and CO_2.she reflected the contribution of Bio-gas towards effect of pollution.She was saying with confidence.Saket and others considered her positively.	strong	To make interaction on Bio-gas formation
Has ability to concentrate on the task in hand	Deepti was trying to ask questions about biological enviornment.she had observation towards the material .she approached towards Mridula's view points.Mridula,s views on Nitrogen ($N_{2)}$,Oxygen ($O_{2)}$ on earth's atmoshphere were interacted by her.The resources were highlighted by her.Mridula co-operated her to draw the diagram.	strong	To share with others
Shares each other	Deepti was open to ask question about the consumption of Disel fuel. Mamata's view on this was interacted by Deepti.Saket was listening to the	strong	The situation of Disel fuel was explained.

	statement. Deepti's body language was seen affirmative.There was open discussion to judge Deepti's view.All have given response to Deepti.		
Initiate dialogue	Deepti was eagerly listening to the sayings of Saket .Deepti considered Hydrocarbons as the cause of pollution.she also discussed economic dimensions of pollution.she pointed her finger to highlight some points.she also conveyed the list of solutions.Saket and Mridula started their conversation and borrowed something from Discovery channel. Deepti took the points to list out the arguments. The solutions were repeated and their relevant to the consequence of pollution were listed.	strong	To know the economic effect of pollution

Checklist Matrix (Dynamics Of Neelam's Behaviour)

Willingly participates in the step of problem solving	She was silently following Mridula during the loud reading of the problem statement	strong	The first step of PBL was followed.
Ability to concentrate on the task in hand	She was following word by word of the statement to locate the given data.Her face and head was bent down.	strong	To know the given data' from the problem statement.
Joins in conversation with others	She had eye contact towards Deepti and Mamata while explaining about global average temperature.	strong	To clarify the carbon's new number.
Joins in activities with others	She raised a question related to thermostat and asked to Jalpa .she kept eye contact towards Jalpa	strong	To make querry about 'thermostat'
Joins in team work with others	She took the responsibiity of maintang the record of 'possible solutions'	strong	The principle of 'division of labour'was followed in team work
Works well along with a team	She raised further question related to thermostat	strong	To find out the meaning of thermostat
Works well along with Jalpa	She made querry about the flxbility of the carbon number from Jalpa's explanation	strong	To know the nature of flexibility of carbon number in atmoshphere
Works well along with Mridula	She made clarifiations about carbon's new number	strong	To clarify why carbon changes into new mathematical number
Thoughtfulness within the group.	She was silent for 40-50 seconds to consider the idea of new carbon number	strong	The term "carbon's new mathematical number' was considered.
Takes active part in group work	She was listening with nodding her head to Saket's explanation	strong	To know the changing number of carbon occures through polluiton.
shows interest on Saket's view	She was interested to write the data presented by Saket. She was easy, her fingers were crossed,head was tiltled forward.She was looking towards Saket and recording the informations in her strong diary.	strong	To record the informations of population

Shares with Mamata	She showed consideration to know the amount of CO_2 level of the atmoshphere asked by Mamata. She along with Mamata voiced loudly to know about the thermostat.Their fingers were pointed towards the group.	strong	To know the term thermostat
Shows natural curiosity	When thermoflask's working principle was stated by Deeepti ,she was careful ,her head was forward,fingers were crossed.she had eye contact towards them.she was rubbing her palms against each other.she was excited .she was questioning about scientific principles.	strong	To querry about the working principle of thermoflask
Joins in conversation with Saket	She was receptive to make conversation about CO_2 with Saket. She explained clearly and correctly.	strong	To collect information about rise of CO_2
Approaches with scientific outlook with Saket and others	She made conversation with Saket about the effect of increase of CO_2.she was with firmly eye movement ,kept her palms open,nodding her head while explaining to Saket and others,argued with cause and effect of CO_2.	stron strong g strong	To understand the cause and effect of CO_2
Appreciation to Saket, Deepti and Mridula.	She was clapping her hands to accept the explanation of Deepti and mridula about psychological calendar .she agreed and undertood the point's clearly.she smiled. She made thank to Saket for clarification strong about normal seasons which was psychologically passed by us.	strong	To know the psychological calendar passed by us
Works well along with the team	The work of the group was to list out the learning issues .she participated to find out the issues with Deepti.she was attentive in listening ,kept eye contact towards Deepti.she understood the issue of going up carbon level and recorderd the points.	strong	To find out the learning issues
Takes active part in group work	She argued the points under the learning issues with their consequences.when Deepti, Saket and Mridula were discussing, she was silently recording the points .she was accepting the main learning issues.	strong	To determine the major and minor learning isssues
Works in peer tutoring with Saket and others	Saket explained carbonate and Bi carbonate to the group.He had an eye contact towards Neelam.Neelam questioned how Bi-carbonate caused pollution? He answered carbonic acid as the cause. She sensitised the effect with her bold eyes.	strong	To know the effect of carbonic acid
Shows interest and exchanges informations in others	Saket informed to Neelam about the impact of 1^0c temperature rise in the glacier.she understood the adverse effect of the world food production.she had crossed her fingers while explaining the fact of food production .Her head was titled forward.	strong	To know the effect of world food production
Joins in conversation with others	Saaket's information about rise in temperature became sensitive to all members in the group. She felt the situation and made discussion with Mridula and Deepti.She talked about how the temperature increased?	strong	To know about the increase of temperature.

Requests information from Jalpa	She rquested to Jalpa to put informations about global warming.she accepted global warming as one of learning issue.she understood the effects of economic development due to global warming.	strong	To collect information about effects of global warming
Approaches easily with Jalpa	She suggested one possible solution of global warming.when Jalpa read out the list of known data,she was convinced to record these points .Then, she took the responsibility to list out 'needs to know'	strong	To find out the list of known data
Works in pair with Mamata	She along with Mamata was recording and verifying the readouts of known data.After finishing the reading task,Neelam did the list of 'Needs to know' and read out in the group.After confirmation,Mridula assured her saying and made thanks.	strong	To list out 'Needs to know'
Action oriented	She read out the list mentioned under 'need to know' .Her eye contact to the group was moderate.she was speaking in a fast-paced voice.she was rubbing her hair while declaring the points.she was bold and confident to prononuce verbally.	strong	To find out the list of "need to know"
Joins in team work with others	Saket's narration about his resourceful material was paid attention by Neelam.She understood the first find facts.She took note of noises-Uh-huh, really? It was doubtful, questioned by Neelam.she was storking her chin .she was open and thinking about the effects of pollution.	strong	To initiate discussion on effects of pollution
Negotiates and compromises with others	Carbon's new mathematics number was argued by Neelam.All others were along with Neelam.she argued how it could be the changing number? When Saket reasoned out about its number, she was silently nodding her head and was saying Okay, that's true! She was ready to agree with him.	strong	To find out the carbon number
Feels happy when she is in the group	She was relaxed and smiled to receive the ideas of Saket. She understood to say this might be true! She was open and inviting to interact with others	strong	To listen in changing the carbon number
Works well along with a team	Jalpa read-out the statement of carbon's new mathematics number.she was asking how? Sometimes she was thinking of the problems and interpretating on her own. She was presenting her idea in a systematic way.	strong	To carry out argument on carbon's new mathematics number
Dignity of labour	Saket argued that due to environmental pollution, the carbon number was changing .Neelam informed the conclusion that "carbon number would neve be constant". strong Her attitude to work was appreciated.Jalpa appreciated through repeating the same by saying carbon's new mathematics number was changed one.	strong	To find common agreement on carbon's number

Approaches others easily	She anxiously talked again about carbon number.Her head was titled forward.she was putting her information forward with body movement.Jalpa was supporting to her view.Mridula and Saket were constantly focusing towards Neelam.	strong	To find relation ship between the group members
Works in peer tutoring	Mamata was highlighting the concept of global warming indicated by Saket.Neelam was listening with her focused eye towards her. She repeated to say the increase in temperature of atmoshphere was globally alarming! It also highlighted the views of Mridula, Mamata and Saket.	strong	To understand the concept of global warming within the group
Joins actively in group work	Neelam made querry on the view of Saket about increase in sea level towards the effect of global warming. Her questioning was encouraged by Mamata and Saket.Her idea was shared by Mamata.She was systematic in asking .she had firm eye to eye contact. Her tone was reasonable, clear and audible.	strong	To be assertive towards group work
Works in pair with Mamata to complete the task.	She was asking with Mamata to ask for questions.The clarification of certain points was also repeated by Mamata.she was summarizing her comments.Mamata was responding and was honest in her response.	strong	To develop inter-personal relationship
Natural curiosity	Mridula was convincing the matter fluently.At that time, Neelam was facing towards her and accepting the matter told by her. She stayed in tune with the conversation what was going on. Her voice was fast –paced.	strong	To listen actively
Active listening	Saket informed carbon number would increase even after global emission stopped.Neelam was looking at Saket directly.she was hearing to the gesture and posture of Saket.she was attentive and had no side conversations when was in the group.she was nodding occasionally and her facial expressions was easy and smiling	strong	To understand the rise of carbon number
Approaches to show agreements	After a deep onversation with Saket, Neelam and other numbers were in deep silence to realize the dangerous situation.Allon sudden, all at-a time raised their voice which leads to noise.all were seated closely to each other .Mridula and Deepti were reading some fascinating facts about carbon number.	strong	To find open agreement
Feels good when she works in the group	Saket was posing thought provoking question to the group.He told if CO_2 would increase ,then what would be the situation on earth?Neelam wa serious and on the alert to open her view.Her eyes were widely opened and She spoke spontaneously .she was eager and leaning forward to the centre of the group to respond the question	strong	To solve thought provoking question

Approaches Jalpa easily	Jalpa readout some extracts from sayings of Saket. At that time, Neelam supported in underlying her statements.she was inclined forward and was smiling frequently.There was pleasant situation within the group .she was saying Okay to the explanation.	strong	To support the views of others
Natural curiosity	While Jalpa was explaining, Neelam posed questions.she tried to find facts.she was sensitive towards the issue.she was not ready to accept the things blindly.	strong	To listen towards explanation
Shows interest on others	While Saket was putting his informations before the group, Neelam was listening.she had an eye contact towards him.she was saying about the causes of global warming along with others.There was noise and seen involvement within others.	strong	To involve herelf in the group discussion
Sensitiveness towards the problem	The problem of global warming frightened to her. She was worried about the challenges and difficulties faced by the people living around the society.	strong	To sense the problem
Joins in team work with others	Saket and others were sensitised the problem due to pollution.Neelam repeated to inform about the rigorousness of pollution.	strong	To know the effects of pollution
Ask for clarifications when talking with others	Mridula's viewpoint on vegetation was doubtful to Neelam. She thought it did not relate to global warming .She asked for clarifications from Mridula.	strong	To know the process of vegetation
Build up a portfolio of work	Neelam collected data to accept the fact about vegetation process.	strong	To have access data and facts
Active listener	Neelam was nodding her head while listening to Saket's view .she was focusing her eyes towards Saket.she said Yes, and OK!	strong	To agree with Saket's views
Shows interest in others and exchanges in informations	Saket was explaining a case-study .Neelam made no counter arguments. The case-study on shrinking of Glacier was interesting to her. Her eyes were contacted towards his discussion.	strong	To share work with Saket
Enjoys fun	She smiled to be informed about greener effect of kutch due to vegetation	strong	To build an evidence of vegetation
Joins in conversation with others	Saket and Jalpa were finding the facts on CO_2 from internet.Neelam made conversations about the positions of Carbon due to fossil fuel.	strong	To pay attention to the conversation
Asks Saket what he has informed	Saket informed research trend on' RUBP' and CO_2.Neelam has querried how RUBP traps CO2.	strong	To know the effect of RUBP on CO_2
Takes active part in group-work	Saket and others were finding the relationship between green house gases to inform global warming potential (GWP). Neelam repeated the data for realization of the situation.she revised the matter. All were satisfied and supported to that effct.	strong	To access the resources.

Starts conversation with ease	Neelam made conversation regarding the micro-organisms with Saket and some facts on health with Mridula.Jalpa was accepting.She was nodding her head. Neelam had eye contact while conversing with others. Strong	strong	To know fascinating facts related to micro-organisms
Take things positively	Deepti was inquiring about the experiment told by Saket.Neelam was appreciating to Deepti.she said OK.	strong	To know the experiments of oceanography
Open agreement to discussion	Neelam sat close to others.Her hands were flat on the table and palms were open.Chest and head were inclined forward.Saket's point was accepted by Neelam and others.	strong	To reach at agreement
Works well along with a team	Neelam was repeating and refining the matter on CFC explained by Saket.There was face to face interaction between them.Eye contacts were moderate to each other.	strong	To share the knowledge
Easily makes relationships with Mamata	When Mamata pointed out different types of diseases caused by pollution.she was naming some of these.she frightened about the future dangerous situation of the society	strong	To find loyality towards her.
Requests information from others	Neelam requested to find some information about project under investigation from Saket.	strong	To know the cause of destructive attitude of the people
Ask to Saket for clarification	While the basic information was presented by Saket in the group, Neelam was rubbing and touching her eyes and ears .Saket found solution for her question.she appreciated saying O.K ,Yes ! Her gesture was smiling in the face.	strong	To clear the doubt
Requests information from others	Neelam asked question to Deepti to know about acidification.Deepti explained the carbonic acid towards the cause of acidification .Saket and Mriduala also informed about PH value of acid and alkaline to this point.Neelam was smiling and expressed thanks to all.	strong	To collect information on acidification
Easily makes relationships	Neelam made discussion with Mamata. She was tapping her hands.Arms were vertically placed on the table. Mamata was answering .Saket also joined with Mamata to explain to Neelam.	strong	To find one-to one relationship between Mamata and Saket
Joins in team work with others	Neelam made eye contact towards Mamata while listenng.she joined in the conversation.Mridula was recording the points.Jalpa was asserting her rights with ease without hurting others.	strong	To promote team-work
Willingly participates in problem-solving	An example of Siachen Glacier was presented by Saket. Neelam was interested to listen.She requested Saket to repeat the fact.Deepti also appreciated Neelam's question.She also asked Bing-bang theory towards contribution of formation of earth.She learnt how Oxygen (O_2) and carbon dioxide (CO_2) were formed.	strong	To find curiosity

Shows interest in others and exchanges informations	Neelam was bent towards right and left to Mridula while listening to her.She was engaged in writing the materials .She was pointing which was interested to her. Saket said O.K and Yes! He accepted the things positively.	strong	To understand other's views
Works in peer tutoring	Neelam clarified others when Saket was explaining.Deepti was also joined with explanation of Neelam .she felt happy and made earnestly thanks for the clarification received from Deepti.	strong	To work in pair
Feels happy when she is in a group	She put forward a case-study to inform about future shock of life on earth.Neelam was agreed to Saket's information.she felt the real situation of earth in future.	strong	To understand threatening life of future
Conversation with ease	Neelam was leaning forward to the table to listen attentively. The narration was logical. Her gesture-posture of hands was seen positively.she was pointing her fingers, nodding her head.she was well convinced.		To share the ideas and information
Works well along with team	Neelam was recording the data related to 'Asian Brown cloud'. Saket informed the issue to all within the group.sometimes she asked to take pause or became slow.she was also asking how brown clouds were seen. Saket acknowledged her question.He explained the scientific reasons and arguments on these points.	strong	To converse the issues with Saket and others
Sincerely expreses thanks for the help received.	When Saket read-out possible solutions, Neelam agreed to these points positively.she was saying OK. with loud voice, pointing their fingers upward.All looking around and were then laughing.Neelam expressed her thanks to Saket.	Strong	To appreciate the work of others
Ask for clarifications when talking with others	Neelam was very prompt to record the data.she had firm eye contact with Saket while listening the facts.After some time, she asked question on Saket's explanation.she repeated twice to ask her doubts.Saket smiled and answered her question.		To accept the explanation with anxiety
Works in pair to complete the task	Neelam was paired with Mamata to draw some judgement and conclusion from Saket's explanations. They were also seriously listening the illustration of effects of global warmings.she also clapped for his contribution towards group discussion.		To find conclusions from Saket's iew
Joins in team work with other children	Saket informed to indicate nuclear reactions in the diagram.Neelam said to make greenery and asked to put less and less green .she also inquired through some questions.		To create interest
Works well along with a team	Neelam was observing the sketch with concentration .Her eyes was focused. She was twisting steadily to see that result.Her chin titlted upwards.she leaned parallel to the table with both hands closed supporting her head.		To find favourable in the group

Approaches others easily	Neelam was observing the sketch with attention .Her eyes were focused.She was twisting gradually to see that result.Saket's drawing was observed by her. Deepti was outlined the diagram.Mridula suggested to show the pieces of stones.Neelam accordingly asked to give arrowmark to show the link between the informations of the diagram.		To understand Saket's diagram
Joins in activities with others	The responsibility to draw some portion was taken by Neelam.when Neelam was drawing, Jalpa was encouraging.Saket shared with her to work quickly. She stayed in tune with the drawings of the picture.All have given feedback to her.		To complete the pcture
Does express her wishes to others	Neelam wa suggesting to modify the diagram by excluding trres and vehicles.Her suggestion was accepted by Saket and accordingly it was sketched.she further repeated to say that all the general causes of pollution should not be included in the diagram.		To put her ideas into the drawings of the picture
Sincerely expresses her thanks for the help received	Neelam appreciated Jalpa for her good concept in bringing into the diagram.Her suggestion to outline the diagram was accepted by all. Neelam was saying O.K and agreed to the point suggested by Mamata and others.		To find appreciation of ideas.
Shares her things wth others	Neelam recalled Tsunami, harbouring situation phenomenon which occurred at Japan. She also illustrated the Kandala port situation to compare with Tsunami.Saket and Deepti pointed out that the reason was due to pollution.she also put data of Tsunami effect. It was felt that the situation becoming alarming!		To cite the evidences by reason of pollution
Joins in conversation with others	Neelam joined in the discussion on economc and finance condition affecting global warming.Deepti, Jalpa and Saket shared the conversation .she questioned to Deepti about the relationship of pollution with population growth. She was forward towards the table.		To know the effect of economic condition due to global warmimg
Easily makes relationships	Neelam along with Mamata were listening attentively the read out material of the group. Neelam had eye contact towards Mamata.She raised migration as the effect of pollution.Mamata appreciated to Neelam saying Good! Her eyes were wide opened.When Saket moved up the question why migration, Neealm was nodding her head .Her hands were interlocked, arms were placed on the table.Eyes were sparkling.		To know the effeets of pollution.
Exchanges informations	Neelam exchanged informations on globalization in response to Saket's view.she informed the effect of global warming.she had eye contact towards Deepti and Saket.Her face		To share on globalization effect.

	was looking pale.She was close towards the middle of the table.Her right hand was put to one side of the fore-head.		
Shows interests on others	Neelam was listening to Deepti's discussion.Her eye was wide opened.she was happy with the information about manipulation of population growth.she was listening seriously.		To know the issue of population growth
Approaches others easily	Neelam was silently listening to the conversation between Jalpa and Mamata.she was sat close to them.she apprehended that future situation would be violent.she was asking questions to Saket in slow voice .Her focus to the question was deep. Her eye contact towards Saket was firmly maintained.		To co-opertae in understanding
Works well along with a team	The present condition on pollution was vividly discussed within the group.Neelam informed the practice of unhygienic food habit. She was comfortable to say this in the group. The problem was pointed out as lack of awareness.she also informed the effect of smoking of the mass.She added tothis towards cause of pollution.		To inform some common problems due to pollution
Prepare an evidence	Neelam tried to explain the phenomenon of R.She also suggested some protective steps.she informed R-12.R-22.R-134A,R-11,R-35. She repeated the use of R-12, R-22 in place of CCL_3f.Jalpa and Saket appreciated her clarification. She was tilted forwad.Her palms were open, placed on the table.All felt the importance of the content of the materials.		To know the phenomenon of 'R'
Makes relationships	Neelam was inquiring about the materials collected through internet.she was calling to other friends to see the materials through computer screen.She intimated by saying My dear friends, come and see'.She also tried to prepare summary points together with Jalpa, Deepti and Mamata.Saket also suggested some view points in response to her contents.Neelam was observing silently.Her eye contact towards them was firmly maintained.		To find one-one relationship
Has ability to concentrate on the task in hand	Neelam reviewed Mridula's point on thermostat.she was repeating the questions for clarification.she was interpretating according to her understanding.she clarified its meaning through conversation with Mridula and Mamata.Mamata supported to the points raised by Neelam.She wrote after her explanation.she was grave.Her eye was focused.She was thumping her head with a pen.Her posture was not erect.		To interpret the meaning of thermostat
Makes relationships with	When Deepti pointed out the genetic roles to explain mutation, Neelam said it was important		To find agreements on

Deepti and Saket	for discussion.She expressed her thanks to Deepti in getting her points.She was smiled.Neelam was arguing her own points with Saket and Deepti. The questions raised by Neelam were answered by Saket. Her eye contact towards them was firmly maintained.		points
Shares her things with others	Deepti explained the points keeping eye contact towards Neelam.Neelam showed interest to listen and participate in her explanation.Both of them came to a decision to prepare a learning issue.		To prepare learning issue
Feels good and happy when she is in a group	She participated in the conversation to continue.she gave her concern to agree the learning issues.she smiled to locate these points.she got acceptance for her view points.		To find recognition
Greater access to resources	Neelam asked for 'EL Nino' effect. She also mentioned this as cyclone.She explained the global warming effect.She was closely sat near to Mamata and Saket.She described with a low pitched voice.Her palms were closed.She maintained an erect posture .she exhibitied confidence.		To know case-study of global warming
Shows interest in others and exchanges informations	Neelam informed carbon and oygen were main components in any pollutant.Her eye was focused and she was grave. she was silently listening.others were agreed on those points.she was smiling while observing the conversation between Saket and Jalpa .She supported Deepti to know about the nomenclature and scientific names. She was anxious to know the names.She smiled in adding her views in order to conclude.she was sitting with her hands closed.she was concerned silently.she thanked to Deepti and Saket.		To switch over informations on pollutants
Has ability to concentrate on the task in hand	Neelam said to list out new learning issues.she was looking towards the situation.All were ready to ask question to each other. All were smiling.		To list the new learning issues
Works in pair to complete the task	Neelam was observing the conversation between Saket and Jalpa.She was sharing her views with Mamata to discuss on Kyto-protocol issue.She had eye contact towards Mamata. She was eager to react with the pollution occurred now. She was erect.she had kept her hands over the table.she was open minded to accept the ideas and views of her.		To understand the case-study on pollution
Ask for clarification when talking with others	Neelam inquired the idea of Mamata about the use of polythene. The information was explained as layman's solution.she was asking questions to Mridula about use of word 'typica'l in the explanation of carbon dioxide emission.Deepti had explained her about the use		To discuss about the factor of pollutant

	of 'typical' .Neelam smiled. She accepted her explanation .She made thanks for her explanation		
Access to resources	Neelam informed Kyto-protocol issue to save pollution on earth. Deepti was interested towards the explanation made by Neelam.She narrated the details of the principles of 'off-setting' what we were emitting.Her hands were flat on the table .Her palms were open. Her head was inclined forward.she was confident.she was explaining this issue without break.		To explain Kyto-protocol
Takes care of others	Neelam had eye contact towards Deepti and Saket while explaining the statements. They had mind while listening. They were slow to repeat the line.she was staying in tune while the conversation was going on. In between conversation, Saket was saying OK! ,'that was true'! Mridula was reflecting 'what was said by Neelam' .she was honest to trace out her views.		To show gratitude
Shares each other	Neelam was repeating some sentences of explanation about effect of carbon dioxide(CO_2) causing enviornemtal pollution.Mridula was convincing to Neelam.She along with Jalpa clarified certain points.she was asking little by little and whispering about the events.Both were seated face toface while conversation was going on. Their ideas were shared each other.when Mridula read-out the materials, Neelam was trying again and again to clarify her doubts.		To know about environmental pollution
Resolves conflict	Neelam was focusing the dialogue with Jalpa.She maintained an erect posture.She was straight forward .she kept her fingertips of both hands together. She was confident to accept Jalpa's arguments.Her head was bent forward.she was excited and interested.She agreed for inclusion of some points suggested by Japa.she was praised by Mamata and Jalpa.		To find acceptance of the views
Shows interests on others	Neelam was interested to draw a diagram after knowing the suggestions inorder to get rid of pollution.She drew a rough sketch about the explanation made by Jalpa.She was sat erectly and was smiling.Her fingers were crossed.Her eyes were blinking.She made firm hand shake with Jalpa.She also clapped to take note suggestions from Jalpa.		To draw diagram of pollution
Approaches others easily	Neelam was listening with eagerness to the explanation of Mridula.She was querring the ideas during her conversation.She was comfortable to ask questions to Mridula.During questioning,Deepti was co-operating to add to explanations of Mridula.Neelam was asking the group about the cause of cut of plants and		To make correspondence with Mridula and Deepti

	suggested for its control and checking of cuttings Jalpa was saying OK,OK! Deepti was accepting.		
Requests information from others	Neelam asked how the electric energy was consumed. Jalpa was responding to her question.Neelam also requested to Jalpa how it works? Jalpa informed a working model related to checking of carbon dioxide which added into poisionous gas. She was rubbing and touching her eyes.Her arms were crossed over the chest.Her ankles were locked each other.		To discuss the effect of electric energy towards pollution
Takes active part in group-work	Neelam was open to listen the explanation of Deepti. Sometimes she was nodding her head.She was giving verbal comments of Yes, Yes! She was looking towards Mridula's writings from her diary.Her eye movement was towards Deepti,Saket and Mridula.Her palms were open and head was inclined forward while she was talking to Mridula and Deepti.		To find possible solution

Checklist Matrix of Dynamics of Behaviours
Of Group- 2

(Dynamics Of Komal's Behaviour)

Behavior	Example	How Important	Why Important
Joins in conversation with others	She observed the conversation between Nikita and Palak. She calculated the increase of temperature to inform them	Strong	To calculate carbon's new mathematics number.
Take things positively	She smiled to pronounce the term of 'carbon's new mathematics number'	Strong	To have acquaintance and acceptance with the Carbon's new mathematics number
Thoughtfulness within the group	She was very much silent for a few seconds to explore the term "Carbon's new number".	Basic	To explore the idea of "Carbon's new Mathematic number"
Shows interest in others and exchange information	She was excited to support the views of Saket. Her body movement was agitated. She was query about the cause of pollution.	Very strong.	To make discussion about the cause of pollution.
Shows interest on Anita's view.	She was easy, looking towards Anita, smiling and recording information in her diary.	Very strong	To find the records and information about pollution.
Shares his responsibility with others in the group	Geeta, Nikita were suggesting to Komal what was to be recorded on the column "Need to know". She was ready to prepare the list accordingly.	Very strong	To find the step "Need t o Know" as per PBL.
Anxiety	She was sat opposite to Anita Her hands were placed on the table, palms were open. she was nodding her head and was looking towards his way of explanation	Very strong	To develop interest to know the fact.
Approaches easily to Anita	When Anita was clarifying about the effect of increase of CO_2, Komal tried to interact with him. She abled to explain correctly.	Strong adequate	To make conversation about CO_2
Extended Thinking	She was silent and grave. Her facial expression was grave. She was stroking her fingers to chin. Her palms were placed under the chin, crossed to each other and closed.	Very strong	To make understandable about psychological calendars.
Shares each others	To Anita's discussion, all were putting their views. Komal had eye contact towards Palak. She was attentively listening to Palak's sayings. Komal asserted her right with ease without hurting others. When cloud density due to global warming was said by Nikita, Komal appreciated to her statement. Anita informed about water scarcity situation to Komal	Strong	To collaborate on view point.

Joins in team work with others.	Anitat informed about rise in sea level affecting global warming. Komal listened with eye contact to him. She asked questions to clarify her doubts along with Geeta.Nikita and Palak were also repeated the same for clarifications.	Very Strong	To initiate conversation about the effect of global warming.
Shows interest in others and exchanges information.	The narration about dangerous situation made frightened to Komal. She was eager to know "why of the situation". She suggested remaining alert for future shock. She was repeating the statements to inform about the alarming situations on earth. She was speaking spontaneously.	Very strong	To know about the future situation of the earth.
Starts conversation with ease.	Komal was posing questions to Anita. She tried for fact finding. She was active to accept with understanding. She narrated a story of early periods of her life to show awareness towards the situations.	Strong	To know amount of release of CO_2 through crackers firings.
Resolves conflict easily	Komal was disagreeing to the opinion that CO_2 helps in vegetation. When Anita showed some research facts to prove that opinion, she was simple to be convinced. She gave feedback to that effect. She summarizes the comments	Very Strong	To be convinced on the view point of Anita
Access to resources	Komal informed vegetation increases the amount of CO_2 in the air and due to photosynthesis vegetation is caused.	Strong	To explain the case of vegetation.
Shares her information with Anita and Palak	Komal reasoned out the situations of the environment. She added carbon-dating and decomposition of CO_2 for discussion with Anita's view point.	Very Strong	To know about taking and leaving of CO_2 in the environment.
Initiate Dialogue with others.	She raised question about role of DNA, Chromosome to Anita. Nikita also raised a question for clarification. Komal responded with openness and honestly. Her conversation was pleasant. She was nodding her head to accept the things said by Anita and Nikita. She said Yes! Yahh!	Very Strong	To find the information about the role of DNA / Chromosome openely
Reflective behavior	Komal made revision about the data displayed earlier. Appreciation to that effect also given by Nikita and others. She listed out the points related to the content. She made a list of table to repeat the data in a systematic manner.	Very strong	To summarize the content.
Shows interest in others and exchange information	Komal added some tips about micro-organisms and its effect towards the group task. These were the fascinating facts about health. She also explained different situations.	Very strong	To make active involvement
Joins in activities with others.	She felt the dangerous situation of the environment forAnita's explanation. She pointed out the global warning as one of the learning issue. It was supported by Geeta and others.	Strong	To inform the alarming situation of the environment.
Approaches others easily	She read out the list of "Know Data" recorded by Palak for further validation.	Basic	To read out the list of Know Data.

Anxiety	She was asking Anita to discuss next information about pollution. She was clapping her hands. Her head was bent forward towards the group.	Basic	To collect information
Joins in team work with others.	She argued about the carbon's new mathematics number. She was grave and silent. She was nodding her head. Her palms were open. She was highly motivated. Her action was speaking louder. She was looking around frequently.	Very strong	To discuss about carbon's new mathematics number.
Easily makes relationship with others	There was liberal discussion between the group members. She found it as a leisure time activity. All were sitting close to each other.	Basic	To make friendship.
Sincerely expresses thanks for the information	She refined the answers of Anita. She was agreed to his answer. She repeated "CFC is causing ozone depletion" and expressed her thanks toAnita.	Very strong	To give feedback to the answers.
Approaches others easily	The information was threat to the society informed Komal. She confidently and loudly said "All are sure to exist and live". Anita was also stayed in tune with dialogue. All were alert, nodding their heads and agreed. It was black hole effect informed Komal, Geeta and Nikita.	Very strong	To find suitable condition for acceptance of view points.
Shows interest in others and exchange information	Anita presented a case-study and some experiments on global warming. Komal was leaning forward towards the table to listen attentively .she was nodding her head and saying ok, yes. She was convinced to share actively	strong	To share new ideas with others
Takes active part in group work	Komal satisfied with explanation of Anita. She was convincing those points to the group	strong	To find scientific outlook
Easily makes relationship	Anita illustrated the effect of global warming with confidence. Komal supplemented the points easily. She appreciated his information and said thanks. There was a thrilling within the group after knowing the information.	Strong	To know global effects
Shows interest in others and exchange information	Komal supported Anita to draw another diagram of earth. She also confused her about the structure of the diagram. She gave some tips for drawing the figure. An imagination to pollution cycle was also suggested by Komal	strong	To involve into Group work
Works in peer tutoring	Komal and Anita were checking some concepts. Geeta and Palak helped to Komal in giving some tips. Both informed to include these concepts while making drawings.Komal was accepting their ideas gladly.	strong	To initiate cooperation

Easily makes relationships	Anita was discussing Black Hole effect. A grave conversation was going on among other members. Komal was silent .She took a piece of paper from Anita to show outline of another diagram. Darshana was saying O.k to this effect. Anita appreciated to Komal and used a black sheet to point out smoke.	Strong	To find one one correspondence between others
Works in pair to complete the task	Komal supported Anita in her discussion. Her involvement in explaining the statement was appreciated by Anita. Her eyes were sparkling.	strong	To find one one correspondence
Prepare an evidence	Komal was very much fascinating to explain her experience. Her hands were open, moving left to right, up and down; body movement was regular and systematic. Her laughing was with loud voice .She reasoned population growth as the cause to global pollution.Anita and Geeta too agreed to those points.	strong	To find out the cause of pollution
Starts conversation with ease	Komal asked the formula of CFC to Geeta.she was watching the verbal interaction about the formula of CFC between Anita and Darshana. Nikita asked for composition of R_{12}. Komal collected the material and read out to highlight. She discussed with Nikita about the available data. Her eye contact during conversation was towards Nikita, Geeta and Anita.She was closely seated near to Anita .The data was given by Anita.	strong	To know about CFC
Works in pairs to complete the task	Komal added the effects of historical monuments due to pollution. Nikita pointed its economic dimension of global warming. Komal requested for other information from Nikita. She asserted to list out under learning issues. Komal asked Anita to approve the learning issues noted on her diary. Anita pointed out the strength of the learning issue.Komal supported her. Komal & Palak were also appreciating his suggestion. All clapped.	Strong	To determine the learning issue
Built up a portfolio of work	Komal took responsibility to make list of possible solutions. Nikita acknowledged her. She was revising the materials through reading. Her communication was successful through arguments. She was looking right into her eyes. She paid attention on the facts. When Komal was reading out the list, Geeta wrote down those systematically.	Strong	To list out possible solutions
Works in peer tutoring with Darshana & Geeta	Komal was clarifying certain points with Darshana. She was asking slowly and whispering the events. Both were seated face to face while conversation was going on. They were telling their ideas to each other. Others were silently observing to both of them.	strong	To collect information on pollution

Checklist Matrix (Dynamics Of Palak's Behaviour)

Behavior	Example	How Important	Why Important
Wilingly participates in the step of problem solving	Palak bent down to see the matter and read silently the statement line by line which was the task of loud reading .	strong	Loud reading of the problem statement was done
Joins in conversation with Nikita	Palak was supporting to view point of Nikita and repeated loudly about the increase of carbon number.Her eye contact was focused towards Nikita while explaining the meaning of new mathematical carbon number	strong	The carbon's new mathematics number was understood
Joins in team work with others	Palak took the responsibility of preparing the list of " known data" in finding the steps of PBL	strong	The work was distributed as per the principle of " division of labour"
Works well along with a team	She informed that the cause of carbon's new number might be due to nuclear weapons	strong	To inform the effect of use of nuclear weapons towards the change of carbon number
Takes active part in group work	She put her view over the explanation of Anita to confirm her understandings	strong	To know the situation of carbon number changing through pollution
Shares his rsponsibiity with others	She listed out the 'known data' as per the clarification of group	Strong	To find out the given data in the problem scenario
Dignity of labour	She maintained her responsibility to keep the list of known data.she wtote the term civilisation under "known data" column as per the suggestion of Geeta.	Strong	To list out "Known data"
Shows interest and exchange informations with Anita	She was sitting opposite to Anita.Her hands were placed on the surface of the table.She was listening without hesitation. She had an eye contact towards his way of narration.she was saying 'okay' and 'that is true' in between his explanation.	Strong	To know the cause – effect of CO_2
Prepares an evidence	Anita's informaton about the dangerous situation of the fututre due to increase in surface temperature shocked Palak and others. She felt the alraming situation and joined in the loud discussion	Adequate	Felt the dangerous situation of food production
Ask for clarifications when talking with others	Saket was ready to refer resourceful materials for his narration .Geeta asked for clarifications .She said it was unknown for her. The group was also unable to answer.she suggested to note the doubtful point for further reference on the next day	Strong	To seek for clarification from the group

Shares each other	Carbon's new mathematical number was questioned by Palak to Komal.she asked why the carbon number is increasing ?Anita quickly replied as 'due to enviornment pollution'	Strong	To know changing number of carbon
Resolves conflict easily	She clarified her doubt on the significance of the statement about carbon's new mathematical number. The statement was dicussed and general agreement on carbon number was resolved within the group	strong	To find common agreement on the statement
Joins in team work with others	Previous work was read out by Geeta. Palak was underlining the sentence extracted from the text .she was closely seated with Nikita and Komal.	Adequate	To revise the previous work
Shows interest in others and exchange information	Geeta emphasised that rise in temerature createed problem to the enviornemnt.Palak repeated her statement. She was nodding her head while Geeta justified the statement.Her head was titled,had lot of eye contact towards her.she was attentive ,responsive and was saying okay in between her listen in.	Strong	To reflect on idea of rise in temperature of the enviornment
Shows her work with others	Palak pointed out the dangerous situation of the enviornment.she tried to alram the danger to the group.She was ready to accept other's view.she was evaluating the alraming situation.	strong	To elicit co-operation
Active listening	When Anita and Geeta were convincing to the group on their views related to effect of global warming ,Palak was nodding her head, kept eye contact towards Geeta,seated near to Geeta and recording on her diary at-a-distance.She was open. She was uttering 'okay', 'that is ntrue' in between her conversation.She was smiling occasionally.	Strong	To become good listener
Approaches others easily	She was listening to the amazing facts told by Anita.she accepted those infomations.She along with Nikita was considerate to cite examples.she was engaged with others in sharing the ideas during discussion .Palak and Darshana were nodding their heads while recording on their diaries.	Strong	To find scope in exchange of information
Expresses her wishes to others	She felt the seriousness of the problem of global warming.she sensitised the problems, challenges, worries of people affected slowly due to global warming.she viewed and shocked about destruction of the society and the community and informed to be aware of the matter!	strong	To feel the problems of global warming

Takes active part in group work	Palak reacted to the rise of temperature due to CO_2.she informed the carbon content as 283 ppm during 80's and at present it is 356 ppm. She also raised the problems faced in food habits which led food poisioning.	Strong	To convey the extent of carbon
Sincerely expresses thanks for the help received	Palak was silent,grave,looking to others,slowly whispering about the matter to Nikita and Anita.Her palm was under the cheek. She was learning forward towards the table.	strong	To understand the fact with empathy
Takes active part in group work	Palak was nodding her head saying 'yes' 'OK' .sometimes she was writing some points .Her head was bent down towards her diary,hands were relaxed over the sides of the table.she was observing the data presented by Saket. she then tried to compare that data.	Strong	To sensitize the fact and data
Does express her wishes to others	Palak communicated non-verbally about green house gases.she was shocked about future days. She switched to inform about fascinating facts about health.Different situtions were explained by her. She had eye contact towards Anita	Strong	To find group approval
shows interest on others	Palak inquired acidification of ocean and told the cause was due to carbonic acid .It was supported by Anita. The PH value of constants was listed by Palak and others to know acidification.	Strong	To know the acidification of ocean
Takes active part in group work	Palak with an erect posture, sitting straight and spoke to the memebrs. She was speaking with slow paced and low pitched voice.Hands were placed besides the hips and palms were open. Finger tips were directed to the centre of the table. She was presenting the data related to pollution.	Strong	To show confidence about the matter
Wilingly participates in problem solving	Nikita explained composition of carbon in the enviornment.Palak also added some point from her resource.she questioned how it occurred in the enviornment.Anita took care to make understandable to all.	Strong	To know different forms of carbon
Sincerely expresses thanks for the help received	Anita informed economic implications due to pollution.Palak was very prompt to record those data .she was smiling, kept her hands below the chin listening to Anita's analysis.she expressed her thanks to him.when Anita was describing the effect of global warming,Palak and Darshana paired together to supplement the points.	Strong	To undertand others with appreciation

Take things positively	Palak was sensing the situation.she put question to Geeta .Geeta repeated Palak's statement and raised her voice.Palak shocked about the future position is alraming! she felt the enviornment will be uncontrolled one day.	Strong	To alarm about the future event
Shows interest o others	She interferred to clarify the concept of global warming and globalisation.she had eye contact towards Nikita and Anita	Strong	To know globalisation effect.
Joins in activities with others	Palak was listening the evidence of natural calamity presented by Anita.she was trying to ask Darshana for her discussion.she was silent and easy.she was also writing the points of the discussion.she had eye-contact towards Anita.	Strong	To discuss the cause of pollution
Resolves conflict	Palak spotted the learning issues without hurting others.she was leaning towards Nikita at-a-distance to find the approved learning issue.she was silently observing others.The other members joined during her conversation and exchanged their views.Komal and Anita supported to her. Palak was appreciating the suggestions of Anita and Komal.There was clapping in the group to receive her suggestions.	Strong	To resolve the learning issue
Works in pair to complete the task	Palak and Anita both explained the points again to include under the learning issue.The discussion was repeated by Palak. She was making notes about few interesting points.she was easy and comfortable to note on the diary.while the recording was finalised,she smilied.Geeta and Anita were providing feedback through repeating the questions and statements.she was closely seated to Anita.	Strong	To promote collaboration in resolving the point
Joins in conversation with others	Palak explained **Bio-char** in relation to pollution.Darshana was repeating her sentence.she was smiling after her completion of explanatin.Palak was highlighting about the alternative to oil consumption. She was looking towards Nikita and Darshana.others were listening. Geeta was providing verbal comments like Yes!,Yes!.	Strong	To find solution of pollution due to consumption of oil
Shares his things with others	Palak provided a daily news about the use of 'Vanaspati Ghee'. she further explained about the product of Hydrocarbon which added to pollution.Darshana was noting. All others were following the diary. Komal and Anita were appreciating the information	Strong	To know hydro carbon as pollutant

Checklist Matrix (Dynamics Of Geeta's Behaviour)

Behavior	Example	How Important	Why Important
willingly participates in the step of problem solving	Geeta took up the task for loud reading	Strong	The first step of problem solving was done
Takes active part in group work	She was accepting Anita's view through repeating the main statements and was verbally prononuncingYes, Yes! She was putting her view, sometimes with the issue explained by Anita.	Very strong	To know about the cause and effect of pollution
Negotiates and compromises with Palak,Komal and Nikita	She made arguments with Komal between civilization and modernization.Komal and Nikita supported to Geeta to mean civilization as modernization.All agreed to write modernization. Palak was also ready to record on headings of 'Known data'.	Very strong	To find out agreement on some common points
Ask others what they have been doing	There was difficulty to categorise the learning issues.she asked and suggested accordingly in order to find out major and minor learning issues to Nikita.she argued with Anita and Nikita on the points with their consequences towards learning issue.	strong	To find out the learning issues
Shows interest in others and exchanges informations	She supported to Komal on the discussion of global warming as one of the learning issue.she argued on economic development. Others involved in discussing with her.	strong	To find out economic development as learning issue
Approaches others easily	She sat closely near to Anita and Darshana.when Darshana informed the conclusion that "carbon number would never be constant" she appreciated saying 'Okay'.	strong	To come closer to each other
Starts conversation with others	Geeta was engagaed in explaining the matter fluently, leaning forward with openness.All were facing in the direction of Geeta.They were agreed with the subjects .All were listening actively.Eye contact towards Anita's explanation was firm.	strong	To make focus towards her views
Negotiates and compromises with others	Komal explained a way to check pollution through multiple use of electronics.Geeta asked question to this fact.she was learning towards the table while discussion was going on and sat solidly with support of arm swings.she found answer from Anita and Komal .she said O.K. she was agreed.	strong	To find active conversation
Easily makes relationships	When Anita was narrating certain amazing data and facts, Geeta along with others was listening.she was appreciating her ideas.she was considerate to give examples.she was comfortable with his informations.she developed good disposition towards her.	strong	To develop beliefness on the views

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Works well along with a team	Geeta documented the data about vegetation collected from the internet material.she stated that it was 2.7 billion years ago.Nikita said how could it help to form the deep forest.Anita said forest growth affected vegetation.	strong	To find the views on vegetation
Shows interest in others and exchanges informations	Geeta was silent, grave, looking towards Anita.Her palm was under the cheek.she whishpered about the **Himalayan Glacier** and **Gangotri glacier** to Nikita.Her words were overlapped with Anita and Nikita.she told the effect of emission of Green house gases.	strong	To collect information on glaciers
requests information from Saket	Geeta understood the calculation of emission and uptake of CO_2 and the extent of balance between the two.She made request to Anita to find out the data related to this.she indicated that CO_2 was more .but, how we would exist?	strong	To know the facts on emission and uptake of CO_2
Can please others eaisly	Geeta outlined the experiment and said "O.K". She said global warming was affecting .so, the temperature had increased too high.she informed about the efforts of some developed country through experiments of global warming.Anita's view was emphasized by her.	strong	To be aware of global warming
Keeps eye contact while talking with others	Geeta was facing towards Nikita to listen her views. There was firm eye contact between each other.Komal was smiling. She was attentively listening to Nikita's statement.Geeta was saying about the need of insurance organization affected due to food pollution.All laughed to listen the news.	strong	To highlight her views
Starts conversation with ease	Geeta asked Nikita about the problem of global warming.Nikita repeated to say "I had a dream last night that clouds were burning" The problem was alarming informed Geeta.She asked for all to take steps to protect global warming.	strong	To know the alarming situation of warming
Starts conversation with others	Geeta added some points with Anita.she was listening to the sayings of Palak..Nikita was writing slowly.All joined with each others in group conversation.They came simultaneously towards the centre of the group. During this, Geeta took care of points that were presented by other members.	strong	To work collaboratively
Asserts her right without hurting others	Geeta and others were disappointed with the grim reality of the society.she questioned about the different types of carbon compounds like CO_2 and CH_4 to Anita.It was intense ground spelled out by Geeta. The reflected ray of sunlight was narrated by her.In this regard , She informed the"Black spot" to the group	strong	To put forth carbon compounds causing "Black spot"
Natural curiosity	Geeta presumed that the existence of life after 50 years would be dangerous.3^0 rise in temperature per each year would affect the rainfall pattern.she apprehended about our existence in future! All woud be panic to exist in those periods!	strong	To feel the dangerous situations in near future

Works well along with a team	Anita indicated economic implications due to pollution. Geeta was assured that the economic effects were due to pollution.she had firm eye contact towards Anita while she was listening .Komal was smiling while listening to her.	strong	To accept the issue of economic effect
Takes things positively	Geeta was silent but all were smiling during a discussed situation.she was sitting silently.She kept her palms under the cheek.she was requesting to complete the tsak. Geeta was observing the drawings.she was concentrating towards the sketch.All were observing with their wide opened eyes.	strong	To accept an information with open mind
Greater access to resources	Geeta added the **volacano** case as one of the cause of release of SO_2 gas. Palak and Darshana had repeated the same things to emphasis this.she had firm eye contact towards her.	strong	To know the effect of environment pollution
Asserts her right without hurting others	Geeta suggested showing the areoplane on the diagram. All were laughed at her.All suggested that it would make deformative so it should not be included. It was then appreciated by Geeta. She selected the black colour for the aeroplane. Palak and Komal said Yes, Yes!	strong	To give the ideas for inclusion in the diagram
Starts conversation with ease	Geeta informed different types of calamities like super cyclone, spinal cyclone.The nature of calamities and cyclones were discussed to see how the normal life of man could be disturbed. Palak and Anita felt seriousness of the calamity of the nature.Nikita even asked about our existence in future could be panic!	strong	To go indepth about the discussion
Shares her things with others	Geeta criticised the mass-media for mis-leading information. She had an argument about the misleading information of media. Komal, Anita and others laughed at her.They remarked the true things. The discussion on cyclone forcaste was indicated by Komal. Geeta sensitized the population effect.she was saying Ok. Ok! She apprehended the future situation also.	strong	To discuss about the cyclone
Ask for clarification when talking with another	Geeta was asking questions to clarify doubts and points.Palak too sought to clarify the points.Anita accepted the points.Geeta and others responded saying Yes, Yes! The data given by Anita were validated by Geeta.she smiled to see the data.The referred data shocked to Geeta.Then, the suggestive solution was agreed by all also.	strong	To validate the data on global warming
Works in peer tutoring	Geeta accepted Anita's interesting materials through internet.she said all right! She welcomed Anita and Nkita and told 'let us write the things'. They were ready to note. Komal and Geeta were whispering each other on the information collected from the internet.They knew the facts and were informed to each other about the cause of pollution.Geeta along with Nikita shared their view points towards group discussion.Geeta adopted her seat according to the situation	strong	To find solutions of pollution

	Geeta was making interference with Palak.she was highlighting the points with repeated questions. She was accepting after the answers were available.Palak and Komal were nodding their head.She was reading loudly.The sentences were readout with clarity and breviety.Palak was observing what and how the apporoved points were recorded by Geeta. Geeta was also supporting the conversation before writing the points on the diary.	strong	To find cooperation during the work
Works well along with a team			
Invites peer to join an ongoing activity of the group	Geeta readout the material related to pollution.Palak, Darshana were shocked about environment pollution and explained some examples to that situation.Geeta was nodding her head while listening to them. She illustrated an event which was increasing the temperature globally.she was curious to inform the group.she smiled.Her palms were open. Her head was inclined forward.she kept her hands flat on the table. She was highly motivated.	strong	To discuss about pollution instances
Takes active part ingroup work	Geeta suggested writing down typically about CO_2 emission and solutions about the ways of minimizing it.Anita and Komal informed some points. She wrote those points in an organized way.she readout to make persuade to the group.she explained those points which needed further explanation.She had an eye contact towards the members while explaining the things.	strong	To know about CO_2 emission
Shares each other	Nikita was making list of solutions.she was accepting the approval of Geeta. Geeta was objective in her argument.when she proved her sayings,all were smiled and made clappings.All had eye contact towards Geeta. Once she shared her experience from her daily situations.Anita was interpreting her description.Geeta was sure and confident about the matter.she was slowly and sequentially delivering to the group.	strong	To explain the cases of pollution
sincerely expresses thanks for the help received	Geeta supported Nikita's view and appreciated her fact.Komal and Anita both were saying Yes, Yes! Darshana said the economic consideration was right.He requested to write on the list of solutions.There was no complain about the list of points. Her eye movement towards Anita was firmly maintained.Her palms were open and head was inclined forward, while he was explaining to the group. The group was silent .She was listing the solutions. The group work was appreciated by all to finalise the solutions.	strong	To maintain the list of the solutions

Checklist Matrix (Dynamics Of Anita's Behaviour)

Behaviours	Examples	How important	Why important
Willingly participates in the step of problem solving	Anita prompted Geeta for loud reading of the problem statement	Basic	The list of known data is to be prepared
joins in conversation with others	She was listening to the conversation of Nikita,Geeta and Palak	Basic	To understand the significance of the word "carbon's new mathematical number"
Explains others	She explained that the rise in temperature was due to increase in carbon dioxide (CO_2)	Very strong	explained the increase in temperature
Joins in team-work with others	He took the task of preparing "learning issues" as per the steps of PBL	strong	'Division of labor ' was implemented to continue team work
Works well along with a team	She examplified a case study that 19% of population in Itly was depending on rice cultivation.	adequate	To explain the effect of population growth
Asserts her right without hurting others	She was in an erect posture to explain examples to maintain warm up discussion	strong	To present the true and valid matters
Works in peer tutoring	She was eagerly informed the data and issues related to pollution to the group.She explained the formation of glaciers of snow to highlight the current pollution.	strong	To know about glacier effect due to pollution
Dignity of labour	She described some evidences to explain the cause of pollution and global warming. It was listened carefully by all. They were interested.	strong	To inform the matter to the group with interest
Confidence and leadership qualities	She was speaking with a high pitched voice, her chest was outward with an erect posture, and sitting near to Geeta.She had maintained firm eye contact to Nikita and others, leaned against the chair.	Very strong	To present her view with truth and precision
Expresses her wishes to Darshana and others	Darshana interacted with her view and all others were silently listening. She wished thank for sharing on the discusion about the cause and effect of carbon dioxide (CO_2).	very strong	To know co-operatively the cause and effect of CO_2
Keeps eye contact while talking others	She was explaining the cause and effect of CO_2. Komal, Darshana and others listened to her.They had kept eye contact. She had wide opened eyes while speaking to them. She had firm eye contact frequently round the group, went along with blinking of eyes, and had sparkle in her eyes.	strong	To know the acceptance of view points

Willingly participates in the steps of PBL	She agreed with the group's discussion that "rise in carbon level due to industriliasation and deforestation' could be the learning issue.She had conversation with Nikita and Geeta towards that point.	strong	To list out the learning issue
Helps when Darshana was behind in her understanding	She had an eye contact towards Darshana when explaining about carbonate and Bi-carbonate to the group.She answered her question on effect of Bi-carbonate towards pollution.she showed gratitude by saying OKAY' and she was attentive to listen her.	Very strong	To make understandable to Darshana about carbonate and its effect towards pollution
Expresses her views to others	She viewed the effects of world food production due to pollution.Geeta Nikita and Komal accepted her views sensitively.They perceived the alarming situation of the environment. The group voiced Oh! Yah! Loudly.	strong	To sensitise the dangerous situation
Initiated dialogue	The carbon's new mathematics number was argued by all .Nikita argued with fast paced loud voice about its fixed number.Anita was ready to answer that the possibility of its fixed number could not be expected.She was speaking with precision and with no hesitation. She had an erect posture while leaning against the chair.	Very strong	To initiate argument on the concept of carbon number
Natural curiosity	Anita shared her view with Komal.Komal put her daily experience in regard to environment pollution. There was support from the group. She informed this view as unscientific and blind belief. Hence, there was laugh! All clapped. She crossed her fingers and head was forward towards the table.	aduquate	To share own experience with the group about environment pollution
Approaches others confidentially	Her information was agreed by all. Querry about the situation was initiated by Palak and Darshana.She joined finger tips of both hands together while she was informing .Her explanation was with high pitched voice.Her argument was informative .She was answering Geeta's question.She convinced the facts to Komal.	Adequate	To convince the facts to each member of the group
Resolves conflict	Anita posed a question to the group .If CO_2 increases day by day, and then what would be the situation on the earth? All were alert! One by one tried to open their views.Eyes were seen wildely open. The dangered post effect of increase of CO_2 was spontaneously felt.Palak and Nikita were listened actively.	Very strong	To know the post effect of increase of CO_2

Shares her things with others	Nikita informed CO_2 synthesized to photosynthesis.Geeta informed the importance of plants for release of CO_2. Anita shared the information about metabolisim process to add with that.	strong	To find the componenets of CO_2
Shows interest in others and exchanges information	Anita explained case study and examples causing environmental pollution. Shee added resources.	strong	To judge the effect of pollution
Approaches others easily	She narrated another case-study on the effect of global warming. Her information about 'Himalayan glacier' was shocked to all.	strong	To know the effect of pollution
Helps out when one of them gets behind in her work	Anita reasoned out the situation of environment and added factor of photosynthesis responsible for vegetation	strong	To add others concept of photosynthesis
Invites peers to join an ongoing activity of the group	She invited Komal and others to see through internet about the idea of splitting of CO_2.It was one of the experiment at California informed by him	strong	To find other's view
Prepare an evidence	Anita provided a calculation of emission and uptake of CO_2 and the extent of balance between the two.	strong	To find the percentage of CO_2 in atmosphere
Enjoys fun	Nikita querried from Anita for repeating the data.Komal, Palak, Darsahan and Nikita had approved Anita's view with thanks and said very true! Komal was supporting to Niita's view .Anita was slowly communicating the data towards the group	strong	To know approval from others
Shows interest on others	Geeta and Komal pointed out Micro-organisms and its effect to the group.Geeta was conveying fascinating facts about health.Anita explained different situations She was open and straight forward.She was leaning forward.	strong	To listen actively
Approaches others easily	Geeta and others had firm eye contact towards Anita. They were refining the view points. There was conversation between Palak and Anita. There was face to face communication with Nikita, Komal and Palak.	strong	To share with others
Ask for clarification when talking with others	Palak pointed out different types of diseases caused by pollution.Anita had good listening with eye contact towards Palak.She was nodding her head and saying Yes' and Ok'! .She was asking about the future earth.She was in peace on positive aspects of Bing-bang theory.	strong	To confirm about the future society

take things positively	Nikita informed her last night dream about "clouds were burning" to the group.She said it was an evidence of global pollution.Anita felt the dangerous effects wer alarming. She took things positively and made promise to protect global warming individually.	strong	To know the dangerous effect of environment pollution
Takes active part in group work	Anita was forward to read the statements about splitting of CO_2.She initiated discussion.All others were participating. She again informed the effect of glacier due to the rise in temperature.	strong	To initiate discussion
Easily makes relationship	When Geeta was explaining diatomic position in CO_2 and oxygen,Anita was bent towards left and right of Geeta.She was closer to Geeta.	strong	To find same information
Works in peer tutoring	Anita's explanation towards cause-effect relationship was appreciated by Nikita.she had eye contact towards Anita. The approach towards point of explanation was positively accepted by Nikita.	strong	To make one-to-one correspondence on point
Works in peer tutoring	Anita asserted that economic progress is affected due to pollution.Komal was curious to note the phenomenon.She was also depressed and was pronouncing "Bhagaban varasha" Anita had eye contact towards Komal.She clarified the picture of rise of temperature in each year.	strong	To find one-to-one relationship with Komal
Prepare an evidence	Anita informed Sulphates, Nitrates, Black carbon, Alides and other pollutants which had spread over area of 10 million sq.k.ms. over south Asia. She also informed the reason of formation of such clouds.Darshana was interested to record the data	strong	To analyse the facts
Asks if she can be of any help to others	Anita informed the cause of diseases .She supported to point out acid rain. She explained it caused all diseases.Komal accepted it as the grave concern occurring largely in Asia. Geeta was also serious towards pollution.	strong	To add more to the resources
Approaches others easily	Anita validated the points with the support of Nikita. Geeta and others were responding with utterance of words of Un-Hanh! Nikita was nodding her head, sitting on an erect posture and was listening attentively.	strong	To get link with others' ideas
Ask if she can be of any help to others	Anita informed to add something to indicate the nuclear reaction in the diagram.It was drawn by Komal and	strong	To imagine the diagram

	supported by the group. The concept of earth's surface was presented in the diagram		
Enjoys fun	Anita's hypothetical diagram was slowly understood by all .After that, all were smiling .Nikita was laughing .Komal was suggesting to show the path of cycle. Nikita gave feedback to Anita.	strong	To know the right concept of diagram
Shares each others with Komal	Anita's work was shared by Komal.Komal kept her seat in reverse to Anita.She maintained an erect posture.she was very fast in her drawings. Both of them were engaged in colouring the same portion of the diagram	strong	To find newness in the work
Ask for clarifications when talking with others	'Industrilisaton' causing pollution was pointed by Palak.Darshana suggested to exclude the trees and add vehicles in the drawing of diagram.Anita asked for clarification to her. She outlined the diagram to show the released vapour from earth.	strong	Negotiation between Neelam and Saket to find the resources
Sincerely expresseses thanks for the help received	Anita's point was perceived by Komal, Darshana and Nikita.They were saying OK, and Good! ANita continued her discussion on SO$_2$ to add in her explanation. It was welcome by Komal and Nikita.She expressed thanks for the help received.	strong	To understand others with a key point
Invites peer to join an ongoing activity of the group	Anita's data pertaining to the effect of global warming was repeated by Komal.Geeta with disatification towards natural world told the disturbed situation was due to global warming.Palak and Nikita were listening to her. Darshana was inquiring the different places of Saiberia and its Location and nature of the city.She also recalled Tsunami for discussion.	strong	To find out cause of pollution
Approaches others easily	The discussion on population growth by Nikita, Geeta and Palak was doubtful. Then, Anita replied the reality to react the situation.She informed the rise in population causing pollution.She also informed about the uncontrolled growth of population.Her eye contact towards Komal, Geeta was firmly maintained.She had seat close to Komal, Geeta and Nikita.	strong	To know the population growth
Resolves conflict easily	Anita added more facts to Komal's views.Both had an argument on those points.Others were also clarifying the	strong	To find common agreement

	matter with Anita.Anita was silentl and independently thinking the matter.After some time there was consensus on these common points. Anita found co-operation from all corner of the members and drew conclusion.She sought some clarifications by asking some questions to the table.She was grave, slow and focused towards the question.		
Helps out when one of them gets behind in her work	Anita suggested to decrease 50% use of CFC.She also clarified to the group about the grim situation of the future.Nikita and Komal were happy to know the fact.Another querry about the food habit was also clarified by Anita.	strong	To convey the use of CFC
Willingly participates in all steps of problem-solving	Anita attempted to read out some solutions from the reflective diary.It was about global warming.She added her views about population explosion.	strong	To discuss the population explosion
Negotiates and compromises with others	Komal and Nikita were in conflict whether to add positive and negative points or not.Anita helped to them in making questioning. She clarified the doubts through the previously written documents.She expressed her opinions to the group.Darshana and others were ready to accept the view points of Anita.	strong	To resolve the conflict
Easily makes relationships with Nikita and Komal	Anita joined in the conversation with Nikita.She pointed out the strength of the learning issue.Nikita and Komal supported her. They appreciated her suggestion.They expressed thanks for the suggestion received.There was smile and clappings in the group.	strong	To find one-one relationship
Asserts her right without hurting others	Anita was asking Komal in order to know her agreement.All on sudden, she said Yes loudly! She was smiling and repeated the sentence to give feedback her. She was easy and comfortable while saying to Komal.	strong	To understand one's argument
Takes care of others	Anita was accepting the views to find a conclusion.She was relaxed to convey her feelings.She was supporting to Nikita's argument.Palak and Darshana were pursuing Geeta to write something.She was easy and normal. Her eyes were focused towards Nikita and Komal .The final readout and solutions were appreciated by Anita.	strong	To find a conclusion
Works in pairs to complete the task	Anita informed about crucial task for disposal of plastics in near future! Komal joined with her to discuss the	strong	To discuss on plastics causing warming

	government rule. Both of them were seated face to face.Anita was silent .She kept her hands crossed on the table.when Komal was asking, Anita with open hand accepted to read out the material Her armes were vertically placed on the table while the hands were gripping the edge.Her posture was erect .Her palms of both hands were not in contact with each other.		
Shows interest in others and exchange informations	Anita added information for further explanation with Darshana. She wrote the solution from her description .she was curious to record to those points Anita was saying Yes, Yes! This was true! All were relaxed to find a solution. Darshana and Palak too were comfortable to find such solution. Anita focused towards Darshana and Komal.Her eye movement was moderate. She was open to participate with Darshan's information.	strong	To find solution related to charcoal
feels happy when she is in a group	Anita was able to explain. She said Yes, Yes! in order to explain the doubt of Komal and Geeta. The group was anxious to listen her explanation.The solution was read out and repeated to finalise. Her experiences relevant to pollution was appreciated by Nikita and Geeta.Anita smiled .She was happy.	strong	To find possible solution

Checklist Matrix (Dynamics Of Nikita's Behaviour)

Behaviours	Examples	How important	Why important
Joins in conversation with Palak	Nikita was explaining about the frequent change of carbon number. She had an eye contact towards Palak.She tried to prove the carbon number which became new.Her palm was open. Palak was supporting her view and said loudly about the increase of number. It was accepted by both.	strong	It was needed explanation to find out the importance of the statement
Works well along with Geeta	She presented along with Geeta the evidence of cause of nuclear weapon which changed the carbon's new number	strong	To identify similar effect of nuclear weapons
Shows interest in others and exchange informations	She was excited to support the key statements of Anita.Her body movement was energized .she addedd some explanation to his view for further clarificatinon.	Strong	To make discussion about the cause of pollution
Shows interest on Anita's view	She was interested to write the data extracted from Anita's explanation.She was easy and comfortable ,smiling.She was recording in her diary.	strong	To emphasis the current situation of pollution
Shares each others	She was suggested by Komal to write "thermostat" as learning issue.But, she said it was doubtful and needed clarification.So it should be listed under " Need to know" and she informed Komal to write this as part of her responsibility.	strong	To find out the importance of word "thermostat"
Shows exchange informations to Anita	In Anita's explanation about the cause of pollution and global warming, she was listening sincerely. She had no hesitation. She sat opposite to Anita. She was Easy and simple .	strong	To explain the cause of pollution
Takes active part in group work	She together with Komal interacted with Anita to clarify the effect of increase of CO_2 in the atmoshphere.	strong	To clarify the effect of CO_2
Shows more open to agree with Anita	She added her texts towards the discussion made by Anita..Her hands were flat on the table and palms were open. she was nodding her head.	strong	To emphasis the toipc of CO_2
Negotiates and compromises with others	Deepti moved up to clarify the list of learning issues in front of all. She convinced to the group about the issue of rise in carbon level. She proved that it was due to industriliasation and deforestation.Komal ,Darshana and others argued to write any one of the two.Anita and Nikita both made discussion to derive some valid points. Accordingly the group was convinced by Nikita to accept the issue of deforestation.	strong	To confirm the causes of rise in carbon level**.**
Starts conversation with ease	She startd her conversation with Anita and Geeta to find the consequence of learning issues. Darshana and Palak were listening to record those points.	strong	To know the learning issues

Works in peer tutoring	She made thanks to Anita for her information about precarious situation of the enviornment.she became sensitive to discuss with Geeta and Komal.Darshana and Palak were remained silent .All on sudden they thought over the matter.	strong	To find the views of all towards this situation
Ask for clarification when talking with others	Nikita was anxious to listen about information of pollution from Anita.she was unknown to such informations.she asked for clarification from the group.The researcher suggested to find references on the doubtful matter.	strong	To know some effects of pollution
Asserts her right without hurting others	The statement of carbon's new mathematics number was underlined by her.she demanded that always carbon number was changing. She emphasised that the changing number could be mathematically magic.so, it was rightly mentioned in the problem scenario. Nikita in formed and it was open by all. She said Okay!	strong	To know the change of carbon number
Resolves conflicts easily.	She put her palm below the chin.She asked for the validity of the statement of carbon's new mathematics number.Darshana and others were ready in accepting the ideas. The group concluded that "the carbon number would never be constant" .she was smiling frequently and showed responsibility.	strong	To resolve about carbon number
Joins in team work with others	While Geeta was explaining,Nikita along with Palak and Komal were close to each other . Nikita was justifying the statement of Geeta through text reading .she was interested to calculate the rise in temperature.	strong	To initiate discussion about the issue of rise in temperature
Resolves conflict easily	Whether vegetation supportes global warming or not was debated.Nikita was confused to find the meaning of vegetation.she presented some facts about forest growth to discuss about vegetation. Her hand was gripped with the other arm and hand, Feet was tapping and she was speaking in a high pitched voice.she was also stuttering .she often was clearing her throat.	strong	To clear the doubt on vegetation
Has ability to concentrate on the task in hand	The case-study on Himalayan Glacier was thought by Nikita.Her palm was under the cheek. All were adding views to her points when she was saying .	strong	To share with view points and accept to that extent
Approaches others easily	Nikita acknowledged Geeta's ideas with ease.she was following her. She was smiling in this situation. She was indicating fingers towards her.	strong	To create interest
Shows interest in others and exchanges informations	Anita informed the calculation of emission and uptake of CO_2 and the extent of balance between the two.Nikita was noting the data and in the meantime. she informed the cause of deforestation.she was frequently using the data and reading loudly.she asked question for realisation of the situation.she tried to communicate the data within the group.It was discussed by Anita.She came out. Both Anita and Komal raised the points.	strong	To develop awareness about the data

Starts conversation with ease	Nikita was inquiring about the experiment through asking questions .she had eye contact towards Anita and Geeta.She had appreciation on Anita's information.She said O.K.	strong	To initiate dialogue
Keeps eye contact while talking with others	Nikita had eye contact towards the group to convey about unknown diseases .she informed the group that 2012 would be danger to society. The future shock was threatening to all.	strong	To pass message about future shock
Requests information from others	When Palak asked the tropical region of world, Nikita was rubbing and touching her eyes and ears for a few minute, she was silent.she was convinced about Anita's narration.	strong	To clear the doubt
Ask for clarifications when talking with others	Nikita asked for help from Anita to know positive effects of global warming.Anita explained the situation of temperature and glacier relationships.She said the rise in temperature was out of prediction.she appreciated her view and said O.K and Good.!	strong	To know effect of global warming
Approaches others easily	Cloud density was changed due to global warming.Nikita convinced to Anita about this.Komal was listening to her.Anita answered water condensation might be the reason.Geeta and Nikita were inquiring about the reply of Anita.	strong	To collaborate and co-operate
Easily makes relationships	Nikita was interested towards Geeta's view.she sat nearer to her. She kept eye contact firmly towards Geeta.she was listening attentively on diatomic positon in the formation of oxygen and carbon dioxide.	strong	To exchange within one to one view
Joins in conversation with others	Palak shared her views with Geeta .Komal made finger pointing to agree with the views of Geeta. Nikita was highlighting which was interested to her. She asked Geeta to read out and present the points .she was saying ok. She was actively listening. She expressed her thanks to Geeta.	strong	To find intimacy with Geeta
Willingly particiaptes in problem solving	Nikita explained some mechanism of carbon occurred in the enviornment .Anita took care to refine for further understanding.she took active part in reading the statement ,searching the cause-effect relationship between points in the group.she had eye contact towards Anita.	strong	To initiate dialogue
Requests information from others	Nikita requested to know from Anita about some research trend. Anita illustrated about future shock. Anita's narration was encouraging among the group. During explanation,Geeta and Nikita were paired and were more approachable towards the discussion	strong	To create a value system
Approaches others easily	Anita's continuation to validate the content on effect of global warming was listened by Nikita.She was nodding her head, sitting erectly.she was listening attentively.	strong	To respond others

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Works in pairs with Geeta to Complete the task.	An imagination about the cycle of pollution and its protection was sketched by Anita.Nikita guessed and tried to ask Geeta .Anita's hypothetical diagram was slowly understood by all.All were smiling.Nikita was also smiling.she was talking something to Komal.	strong	To understand the diagram
Works well along with the team	Nikita agreed to AAnita's view on the sketch of diagram.she was excited to find full scape size diagram.She was smiling.she was closer to the seat of Anita and Komal.she leaned against the chair while viewing the diagram .she was also praising Anita's idea on that.	strong	To understand the diagram
Build up a portfolio of work	Nikita mentioned case-study pertaining to the effect of global warming.she referred in response to Komal's explanation. She informed the occurrence of 'atom Bomb' as the reason of environment pollution.she explained about the dangerous devastation to all. She was inclined forward and noding her head. She had firm eye contact towards Anita and Geeta.she had placed her hands above the table and Palms were open.	strong	To inform the effect of global warming
Resolves conflict easily	The doubt on migration was differed between Nikita and Anita. Th argument led to dicuss the population growth .she emphaised that population growth led to migration and hence towards global waming.she put her palm below the chin and her index finger was pointed and extended along the cheek.	strong	To find out possible effect of pollution
Prepare an evidence	Nikita informed the scientific reasons of global warming.she explained the facts with logical relationship between CO_2 and water. She maintained eye contact towards the group.Her voice was low pitched and slow paced.Her posture was straight forward.she sat to the reverse of Anita, Komal and Geeta.	strong	To inform the facts to the group.
Sincerely expresses thanks for the help received.	Nikita listened the matter narrated by Geeta .she had eye contact towards her.she was open, easy and smiled with low voice.she was sensing the situation and said Oh! , Oh! She was astonished and told how could it be possible? She was happy and expressed her thanks to Geeta, Anita and Palak .She informed about the interesting information of Geeta.	strong	To sense the situation
works in peer-tutoring	Nikita asked Geeta about the classification.Geeta discussed with her.Nikita recorded the key points while conversation was going on.she had firm eye contact with Geeta.she had an erect posture.Her voice was slow.she was eager to ask about the abbreviation of R. she was interested to find out the facts for her.She found data with the help of Anita.Anita and Palak appreciated her in getting the data.Nikita said Good!	strong	To find one-to – one relationship with Geeta

Starts conversation with ease	Nikita informed that more toxic chemicals were being used which threatened our climate. She was highly motivated. Her hands were flat on the table.Her palms were open.Her head was inclined forward.Her eyes were wide opened.some facts explained by Palak was also communicated by her.while explining, the cause and effect of the facts were communicated by her.	strong	To explain in detail about the role of R_{12}
Ask for clarifications when talking with others.	Nikita further influenced about the meaning of thermostat.Komal and others were clarifying the word. Nikita was trying to finalise the learning issues by the review of others.She asked Geeta, Darshana and Palak to put their ideas to find a common agreement. She also again raised the learning issue of vegetation to take common agreements from the group. She was accepting the common points. She was questionning to accept the minor issues.	strong	To find the meaning of thermostat
Works in peer tutoring with Anita	Nikita informed the group about the pollutants.she had an eye contact towards Anita.Anita was also supporting to her points and suggested to write those points. Nikita was nodding her head. Anita considered economics club in her suggestion.Nikita was excited to give her experience .All were also agreed to accept the same.	strong	To share knowldege on pollutants
Joins in team work with others	Nikita joined with Komal to make interpretations.Komal was noding her head. Nikita made the repeatation of sentences. She was reading loudly.The sentences were read out with clarity and breviety.All were accepted the things. There was overall agreement on those points.	strong	To seek co-operation
Requests information from Geeta	Nikita agreed with the view points read by Geeta.She believed a nurturing enviornment free from pollution. She informed this experience to the group. She was looking right into her eyes.she was straight-forward.Nikita kept her hands relaxed on the table,had eye contact towards Geeta.Her facial expression was pleasant.All others were also listening.	strong	To find the information on pollution
Takes care of others	Nikita appreciated Geeta by saying 'Exactly'.She explained Darshana about this effect.Darshana was smiling after understanding this point.She accepted her explanation.Nikita was also inquiring Komal in order to include some points.	strong	To discuss on CO_2 emission
Shows interest in others and exchanges informations	Nikita joined in Komal's explanation by asking questions.She had eye contact towards her.Komal was also answering to her question.There was one-to-one interaction between them through questionning. The questions were related to occurrence of pollution. The answers were concurrent.Nikita repeated the answers.	strong	To frame questions on occurrence of pollution

Has ability to concentrate on the task in hand	Nikita was trying to ask questions about biological enviornment.she had observation towards the material .she approached towards Geeta's view points.Geeta's views on Nitrogen (N_2) ,Oxygen (O_2) on earth's atmoshphere were interacted by her.The resources were highlighted by her.Geeta co-operated her to draw the diagram.	strong	To share with others
Initiate dialogue	Nikita was eagerly listening to the sayings of Anita .Nikita considered Hydrocarbons as the cause of pollution.she also discussed economic dimensions of pollution.she pointed her finger to highlight some points.she also conveyed the list of solutions.Anita and Geeta started their conversation and borrowed something from Discovery channel. Nikita took the points to list out the arguments. The solutions were repeated and their relevant to the consequence of pollution were listed.	strong	To know the economic effect of pollution

Checklist Matrix (Dynamics Of Darshana's Behaviour)

Joins in conversation with others	She had eye contact towards Nikita and Palak while explaining about global average temperature.	strong	To clarify the carbon's new number.
Joins in team work with others	She took the responsibiity of maintang the record of 'possible solutions'	strong	'Division of labour' was followed in team work
shows interest on Anita's view	She was interested to write the data presented by Anita. She was easy, her fingers were crossed, head was tiltled forward.She was looking towards Anita and recording the informations in her strong diary.	strong	To record the informations of population
Shares with Palak	She showed consideration to know the amount of CO_2 level of the atmoshphere asked by Palak. She along with Palak voiced loudly to know about the thermostat.Their fingers were pointed towards the group.	strong	To know the term thermostat
Joins in conversation with Anita	She accommodated on the conversation about CO_2 with Anita. She explained clearly and correctly.	strong	To collect information about rise of CO_2
Takes active part in group work	She argued the points under the learning issues with their consequences.when Nikita, Anita and Geeta were discussing, she was silently recording the points .she was accepting the main learning issues.	strong	To determine the major and minor learning isssues
Shows interest and exchanges informations in others	Anita informed to Darshana about the impact of $1\,^0c$ temperature rise in the glacier.she understood the adverse effect of the world food production.she had crossed her fingers while explaining the fact of food production .Her head was titled forward.	strong	To know the effect of world food production
Requests information from Komal	She rquested to Komal to put informations about global warming.she accepted global warming as one of learning issue.she understood the effects of economic development due to global warming.	strong	To collect information about effects of global warming
Works in pair with Palak	She along with Palak was recording and verifying the read outs of known data.After finishing the reading task,Darshana did the list of 'Needs to know' and read out in the group.After confirmation,Geeta assured her saying and made thanks.	strong	To list out 'Needs to know'
Joins in team work with others	Anita's narration about her resourceful material was paid attention by Darshana.She understood the first hand facts.She took note of noises-Uh-huh, really. It was doubtful, questioned by Darshana.she was storking her chin .she was open and thinking about the effects of pollution.	strong	To initiate discussion on effects of pollution
Feels happy when she is in the group	She was relaxed and smiled to receive the ideas of Anita. She understood to say this might be true! She was open and inviting to interact with others	strong	To listen in changing the carbon number

Works well along with a team	Komal read-out the statement of carbon's new mathematics number.she was asking how? Sometimes she was thinking of the problems and interpretating on her own. She was presenting her idea in a systematic way.	strong	To carry out argument on carbon's new mathematics number
Approaches others easily	She anxiously talked again about carbon number.Her head was titled forward.she was putting her information forward with body movement.Komal was supporting to her view.Geeta and Anita were constantly focusing towards Darshana.	strong	To find relation ship between the group members
Joins actively in group work	Darshana made querry on the view of Anita about increase in sea level towards the effect of global warming. Her questioning was encouraged by Palak and Anita.Her idea was shared by Palak.She was systematic in asking .she had firm eye to eye contact. Her tone was reasonable, clear and audible.	strong	To be assertive towards group work
Natural curiosity	Geeta was convincing the matter fluently.At that time, Darshana was facing towards her and accepting the matter told by her. She stayed in tune with the conversation what was going on. Her voice was fast –paced.	strong	To listen actively
Approaches to show agreements	After a deep onversation with Anita, Darshana and other numbers were in deep calm to realize the dangerous situation.All on sudden, they at-a time raised their voice which led to noise.All were seated closely to each other .Geeta and Nikita were reading some fascinating facts about carbon number.	strong	To find open agreement
Natural curiosity	While Komal was explaining, Darshna posed questions.she tried to find facts.she was sensitive towards the issue.she was not ready to accept the things blindly.	strong	To listen towards her explanation
Active listener	Darshana was nodding her head while listening to Anita's view .she was focusing her eyes towards Anita.she said Yes, and OK!	strong	To agree with Anita's views
Shows interest in others and exchanges in informations	Anita was explaining a case-study .Darshana made no counter arguments. The case-study on shrinking of Glacier was interesting to her. Her eyes were contacted towards her discussion.	strong	To share work with Anita
Starts conversation with ease	Darshana made conversation regarding the micro-organisms with Anita and some facts on health with Geeta.Komal was accepting.She was nodding her head. Darshana had eye contact while conversing with others.	strong	To know fascinating facts related to micro-organisms
Open agreement to discussion	Darshana sat close to others.Her hands were flat on the table and palms were open.Chest and head were inclined forward.Anita's point was accepted by Darshana and others.	strong	To reach at agreement
Easily makes relationships with Palak	When Palak pointed out different types of diseases caused by pollution,she was naming some of these.she frightened about the future and its dangerous situation towards the society	strong	To find loyality towards her.

Ask Anita for clarification	While the basic information was presented by Anita in the group, Darshana was rubbing and touching her eyes and ears .Anita found solution to her question.she appreciated saying O.K, Yes! She had smiling in the face.	strong	To clear the doubt
Easily makes relationships	Darshana made discussion with Palak. She was tapping her hands.Arms were vertically placed on the table. Palak was answering .Anita also joined with Palak towards Darshana's explanation.	strong	To find one-to one relationship between Palak and Anita
Willingly participates in problem-solving	An example of Siachen Glacier was presented by Anita. Darshan was interested to listen.She requested Saket to repeat the fact.Nikita also appreciated Darshana's question.She also asked Bing-bang theory towards contribution of formation of earth.She learnt how Oxygen (O_2) and carbon dioxide (CO_2) were formed.	strong	To find curiosity
Works in peer tutoring	Darshana clarified others when Anita was explaining.Nikita was also joined with explanation of Darshana .she felt happy and made earnestly thanks for the clarification received from Nikita.	strong	To work in pair
Conversation with ease	Darshana was leaning forward to the table to listen attentively. The narration was logical. Her gesture-posture of hands was seen positively.she was pointing her fingers, nodding her head.she was well convinced.		To share the ideas and information
Sincerely expresses thanks for the help received.	When Anita read-out possible solutions, Darshana agreed to these points positively.she was saying OK. with loud voice, pointing their fingers upward.All looking around and were then laughing.Darshana expressed her thanks to Anita.	Strong	To appreciate the work of others
Approaches others easily	Darshana was observing the sketch with attention .Her eyes were focused.She was twisting gradually to see that result.Anita's drawing was observed by her. Nikita was outlined the diagram.Geeta suggested to show the pieces of stones.Darshana accordingly asked to give arrowmark to show the link between the informations of the diagram.		To understand Anita's diagram
Exchanges informations	Darshana exchanged informations on globalization in response to Anita's view.she informed the effect of global warming.she had eye contact towards Nikita and Anita.Her face was looking pale.She was close towards the middle of the table.Her right hand was put to one side of the fore-head.		To share on globalization effect.
Approaches others easily	Darshana was silently listening to the conversation between Komal and Palak.she was sat close to them.she apprehended that future situation would be violent.she was asking questions to Anita in slow voice .Her focus to the question was deep. Her eye contact towards Anita was firmly maintained.		To co-opertae in understanding
Has ability to concentrate on the task in hand	Darshana reviewed Geeta's point on thermostat.she was repeating the questions for clarification.she was interpretating according to her understanding.she		To interpret the meaning of thermostat

	clarified its meaning through conversation with Geeta and Palak.Palak supported to the points raised by Darshana.She wrote after her explanation.she was grave.Her eye was focused.She was thumping her head with a pen.Her posture was not erect.		
Takes care of others	Darshana had eye contact towards Nikita and Anita while explaining the statements. They mind while they were listening. They were deliberate to repeat the line.she was staying in tune while the conversation was going on. In between conversation, Anita was saying OK! ,'that was true'! Geeta was reflecting 'what was said by Darshana' .she was honest to trace out her views.		To show gratitude
Shows interests on others	Darshana was interested to draw a diagram after knowing the suggestions inorder to get rid of pollution.She drew a rough sketch about the explanation made by Komal.She sat erectly and was smiling.Her fingers were crossed.Her eyes were blinking.She made firm hand shake with Komal.She also clapped to take note suggestions from Komal.		To draw diagram on pollution
Takes active part in group-work	Darshana was open to listen the explanation of Nikita. Sometimes she was nodding her head.She was giving verbal comments of Yes, Yes! She was looking towards Geeta's writings from her diary.Her eye movement was towards Nikita,Anita and Geeta.Her palms were open and head was inclined forward while she was talking to Geeta and Nikita.		To find possible solution

Content analysis summary of group-1

SN	Dynamics of behaviour	Demonstrated by participants					
		T11	T21	T31	T41	T51	T61
1	Takes active part in group-work	5	3	6	7	5	3
2	Joins in team work with other children	5	2	2	3	2	4
3	Willinglyparticipates in all steps of problem solving	4	2	2	3	2	4
4	Easily makes relationships	2	4	4	3	7	5
5	Invites peer to join an ongoing activity	1	-	1	3	-	5
6	Has ability to concentrate on the task in hand	2	3	1	3	3	4
7	Take things positively	3	1	1	2	1	2
8	Feels happy when she is in a group	3	2	2	2	5	5
9	Joins in conversation with others.	2	6	3	2	2	3
10	Works in pairs to complete the task	5	5	3	1	4	1
11	Works in peer tutoring	1	3	4	6	5	8
12	Works well along with a team	4	5	6	7	8	5
13	Dignity of labour	2	1	2	2	1	3
14	Acceptance to view point of others	1	-	-	1	-	-
15	Thoughtfulness within the group	1	1	2	1	1	2
16	Action oriented	1	-	-	-	2	-
17	Active listening	1	1	1	1	2	-
18	Shows interest in others and exchange informations	12	7	10	5	4	6
19	Does express his wishes to others	2	1	1	1	1	2
20	Approaches others easily	5	4	9	3	8	5
21	Ask for clarifications when talking with otherrs	2	5	4	4	4	2
22	Sincerely expresses thanks for the help received	3	3	1	5	2	1
23	Starts conversation with ease	1	5	4	5	5	5

24	Requests information from others	3	4	1	3	8	-
25	Shares each other	5	5	7	1	2	3
26	Joins in activities with others	3	2	4	-	2	1
27	Asserts his right without hurting others	1	3	2	4	-	5
28	Shows interest in others	1	5	2	1	4	2
29	Shares his things with others	3	3	1	5	2	6
30	Can please others easily	1	1	2	4	4	6
31	Can adoptaccording to the situations	1	-	1	-	-	1
32	Resolves conflict easily	3	5	4	4	1	8
33	Build up a portfolio of work	2	2	6	-	1	7
34	Greater access to resources	7	3	5	4	2	11
35	Initiate dialogue	1	5	5	-	-	2
36	Prepare an evidence	2	2	6	2	1	5
37	Share your work with others	1	2	3	1	-	3
38	Takes care of others	-	4	1	2	1	6
39	Shows more open to agree with others	-	1	2	-	1	-
40	Negotiates and compromises with others	-	3	-	5	1	4
41	Natural curiosity	-	1	3	3	3	1
42	Scientific outlook	-	1	1	-	-	-
43	Keeps eye contact while talking with others	-	1	1	1	-	4
44	Leadership-	-	-	2	2	-	6
45	Reflective behaviour	-	1	3	1	-	3
46	Asks if she can be of any help to others	-	-	1	-	-	3
47	Helps out when others are behind in work	-	-	1	-	-	4

Content analysis summary of group-2

SN	Dynamics of behaviour	Demonstrated by participants					
		T12	T22	T32	T42	T52	T62
1	Joins in conversation with others	2	2	1	-	2	1
2	Joins in team work with others	2	2	2	-	2	-
3	Shows interest towards others	2	1	2	-	3	1
4	Shares with others	3	1	3	1	1	2
5	Active listener	1	-	--	-	1	-
6	Takes active part in group work	4	1	2	1	2	1
7	Shares responsibilities with others	1	-	1	-	1	-
8	Requests information from others	-	3	-	1	1	-
9	Works in pairs	1	1	2	-	1	1
10	Shows interest in others and exchange informations	2	4	2	2	2	2
11	Feels happy when she is in the group	-	-	1	-	1	1
12	Works well along with a team	1	2	-	3	1	1
13	Approaches others easily	1	3	3	1	2	5
14	Joins actively in group work	1	-	1	-	1	-
15	Natural curiosity	-	1	-	1	2	-
16	Approaches to show agreements	-	-	-	-	1	1
17	Open agreements to discussion	-	-	1	-	1	1
18	Easily makes relationships	-	2	3	1	2	2
19	Ask for clarification	1	3	-	2	1	2
20	Willingly participates in problem-solving	2	-	-	1	1	3
21	works in peer tutoring	-	3	2	1	1	3
22	Conversation with ease	-	3	2	4	2	-
23	Sincerely expresseses thanks for the help received	4	1	2	-	1	2
24	Has ability to concentrate on the task in hand	-	2	-	-	-	-
25	Takes care of others	-	1	-	-	-	4
26	Works well along with other	-	1	-	-	-	-

27	Shows more open to agree with other	-	1	-	-	-	-
28	Negotiates and compromises with others	-	1	-	1	-	2
29	Asserts his right without hurting others	-	1	-	2	-	2
30	Resolves conflicts easily	2	3	1	-	-	2
31	Keeps eye contact while talking with others	-	1	-	1	-	1
32	Build up a portfolio of work	-	1	1	-	-	-
33	Prepares an evidence	1	1	1	-	-	2
34	Initiate dialogue	-	1	1	-	-	2
35	Take things positively	1	-	1	1	-	1
36	Thoughtfulness within the group	-	-	1	-	-	-
37	Anxiety	-	-	2	-	-	3
38	Extended thinking	-	-	1	-	-	-
39	Access to resources	-	-	1	1	-	1
40	Reflecctive behaviour	-	-	1	-	-	-
41	Dgnity of labour	1	-	-	-	-	-
42	Explains others	-	-	-	1	-	1
43	Confidence	-	-	-	-	-	2
44	Helps when one was behind in her undrstanding	-	-	-	-	-	3

Appendix-K

Factor matrix of group-1

		I	U	C	A	P
I	Pearson Correlation	1	-.170	.887(*)	.493	.527
	Sig. (2-tailed)		.747	.018	.320	.282
	N	6	6	6	6	6
U	Pearson Correlation	-.170	1	-.206	.598	.504
	Sig. (2-tailed)	.747		.695	.210	.308
	N	6	6	6	6	6
C	Pearson Correlation	.887(*)	-.206	1	.452	.319
	Sig. (2-tailed)	.018	.695		.369	.538
	N	6	6	6	6	6
A	Pearson Correlation	.493	.598	.452	1	.650
	Sig. (2-tailed)	.320	.210	.369		.162
	N	6	6	6	6	6
P	Pearson Correlation	.527	.504	.319	.650	1
	Sig. (2-tailed)	.282	.308	.538	.162	
	N	6	6	6	6	6

Factor matrix of group-2

		I	U	C	A	P
I	Pearson Correlation	1	.928(**)	-.053	.753	.282
	Sig. (2-tailed)		.008	.921	.084	.588
	N	6	6	6	6	6
U	Pearson Correlation	.928(**)	1	.138	.518	.000
	Sig. (2-tailed)	.008		.794	.293	1.000
	N	6	6	6	6	6
C	Pearson Correlation	-.053	.138	1	-.327	-.311
	Sig. (2-tailed)	.921	.794		.527	.549
	N	6	6	6	6	6
A	Pearson Correlation	.753	.518	-.327	1	.452
	Sig. (2-tailed)	.084	.293	.527		.368
	N	6	6	6	6	6
P	Pearson Correlation	.282	.000	-.311	.452	1
	Sig. (2-tailed)	.588	1.000	.549	.368	
	N	6	6	6	6	6

Contents of feedback

T11: (First teacher trainee of first group)

- A very live and worthful discussion was going on
- Vast content related to cause-effects of green house ,new discoveries, experiments related to it and new global warming were covered
- We were enthusiastic to participate
- Co-operation within my group was developed
- It was very great and fruitful experience on my part
- I suggest as good technique of learning

T21: (Second teacher trainee of first group)

- I was enthusiastic to be part of PBL
- I learned many new things due to such topics
- Our group work was cooperative
- it was enjoyful learning
- I received some new knowledge which I did not know earlier with the help of my co-trainees.
- I got confidence both to speak and to put my questions
- It was co-operative session
- I became punctual in participating the group work
- It was opportunity to sit together and share our views.

T31: (Third teacher trainee of first group)

- it was group based learning where different subjects at degree level of students were participated
- knowledge was improved and increased gain
- it changed my attitude
- group based learning made possible to adjust myself in all situations within the group
- It was opportunity to work and understand our teacher's personality too.
- Communication skill was developed.
- Confidence to work with other was raised

- Each time I was greatly motivated ,excited and confident about learning
- Doing novel and new things was boosted
- Over all, it was hard work with lots of joy. So, it was very effective.

T41: (Fourth teacher trainee of first group)

- We became energetic and enthusiastic during the group discussion
- We could share our knowledge and ideas to a greater extent
- It was very interesting
- We learnt co-cooperativeness and working together

T51: (Fifth teacher trainee of first group)

- I got unambiguity and real information about the content matter
- Conversation between us was argumentative
- Increases our social relationship
- Habit of individual information collection was developed
- Feeling of independence was felt
- We shared our information during discussion
- Teacher's encouragement helped me to remain active throughout the discussion
- We were very free to express   our views
- Some times the discussion used to change the track but we were not restricted for that
- It was enjoyful experience
- I learnt problem based learning as the best technique

T61: (Sixth teacher trainee of first group)

- It gave a broad platform to perceive various types of knowledge
- This experience made me as a real social man
- I learnt the real condition of intellectual and social environment to receive knowledge
- I enjoyed very much
- It was very good experience

T12: (First teacher trainee of second group)

- It was new technique for me to learn new things
- The time was great time to have great experience

- It was helpful to recall the past knowledge
- It was live learning
- It was great opportunity to sit in the group-discussion

T22: (second teacher trainee of second group)

- This is very useful for the beginners
- Any one who is not related to the field can also participate
- It was great opportunity to communicate my views with others
- I was able to express my views
- My doubts were cleared with my friends
- It helped me to expand my information
- I felt good due to group discussion
- It was interesting to me to find the information about global warming
- It was very effective

T32: (Third teacher trainee of second group)

- I was lucky to be a part of group learning
- Knowledge about new terms,issues,causes , devices and solutions related with the topic was gained
- I enjoyed each other's company and came to know them better
- Feedback was given to all towards group discussion
- I was experienced cool on Eco-cool
- Hence, it was innovative

T42: (Fourth teacher trainee of second group)

- My knowledge level was improved
- Everybody was able to communicate their own views freely
- New knowledge was learnt by me
- There was division of labor to find out their work
- There was negotiated points resulted after discussion
- The negative point to this that due to dominant behavior some were silent. I am not blaming but it was fact!
- I got very good experience
- It may help me in future career

T52: (Fifth teacher trainee of second group)

- Good knowledge was expanded

- The knowledge gained by me was in-depth

- Others were listening carefully to me

- I took a lot of interest in new knowledge acquisition

- I felt everybody's role is very important

- Every body shared their knowledge and experience

- Skills like readiness, activeness, explanation, presentation of topic, listening others, adjustment in a given situation and overall positive attitude towards each member of the group were developed.

- According to me, it was very effective for development of personality of the students in totality

T62: (Sixth teacher trainee of second group)

- PBL was good learning strategy because through group discussion expanded knowledge was available

- The foundation of problem was clarified so, solving the problem was rooted out

- Through group discussion inter-personal relationship was developed which helps for social development

- Participants own effort helped fro collection information

- But, the participants previous knowledge lacking may hinder the success of the learning

- Guidance and support of the teacher was necessary

- Sometimes, 'one dominated other' was felt during the work. One should be allowed to complete her talk.

- It was good and new experience for me