CO-OPERATIVE LEARNING STRUCTURES

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PREFACE

Cooperative Learning Structures is our collaborative effort to make learning physical science more interactive and enjoyable. In our classrooms, we noticed that students learn better when they work together. So, we explored different ways to make this happen effectively. This book is full of practical ideas and methods that teachers can use to encourage teamwork and critical thinking in physical science classes. We want to create an environment where every student feels supported and engaged in their learning journey.Our goal is to provide educators with easy-to-understand strategies that they can implement right away. By embracing cooperative learning, we believe that students will not only grasp scientific concepts better but also develop important skills for their future.

We hope this book inspires teachers to try new approaches and fosters a love for learning science among students.

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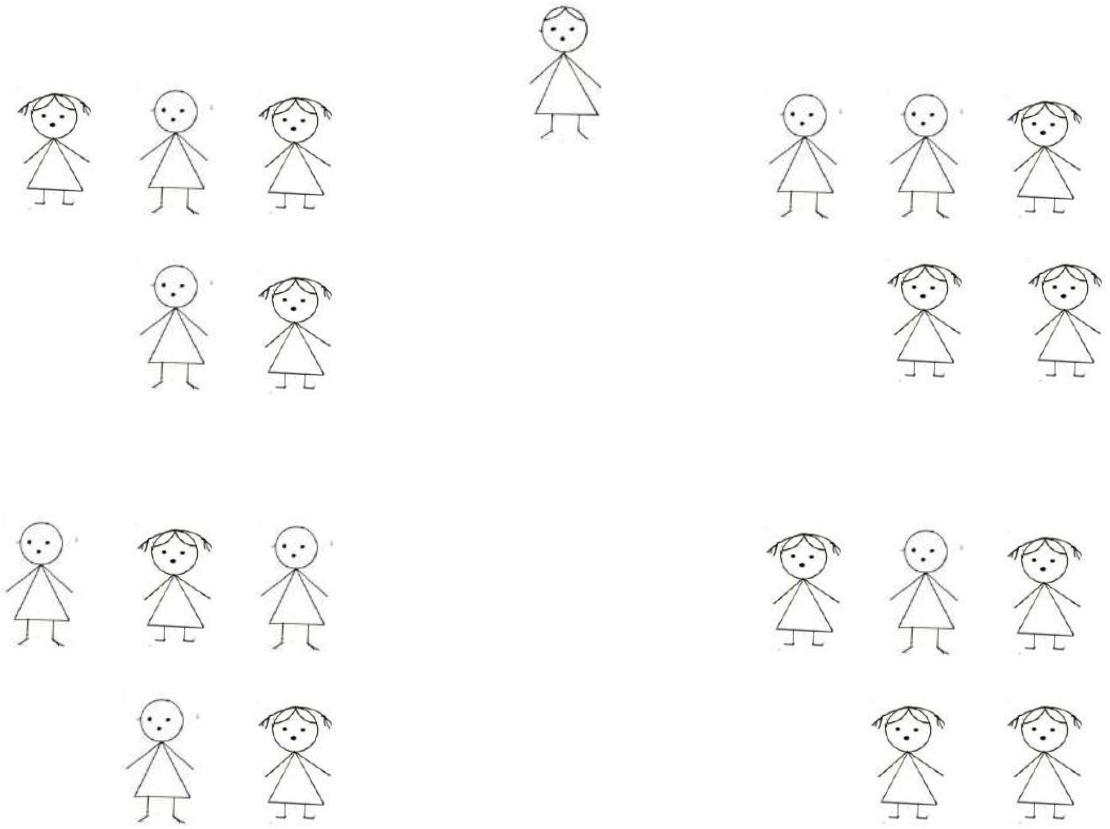
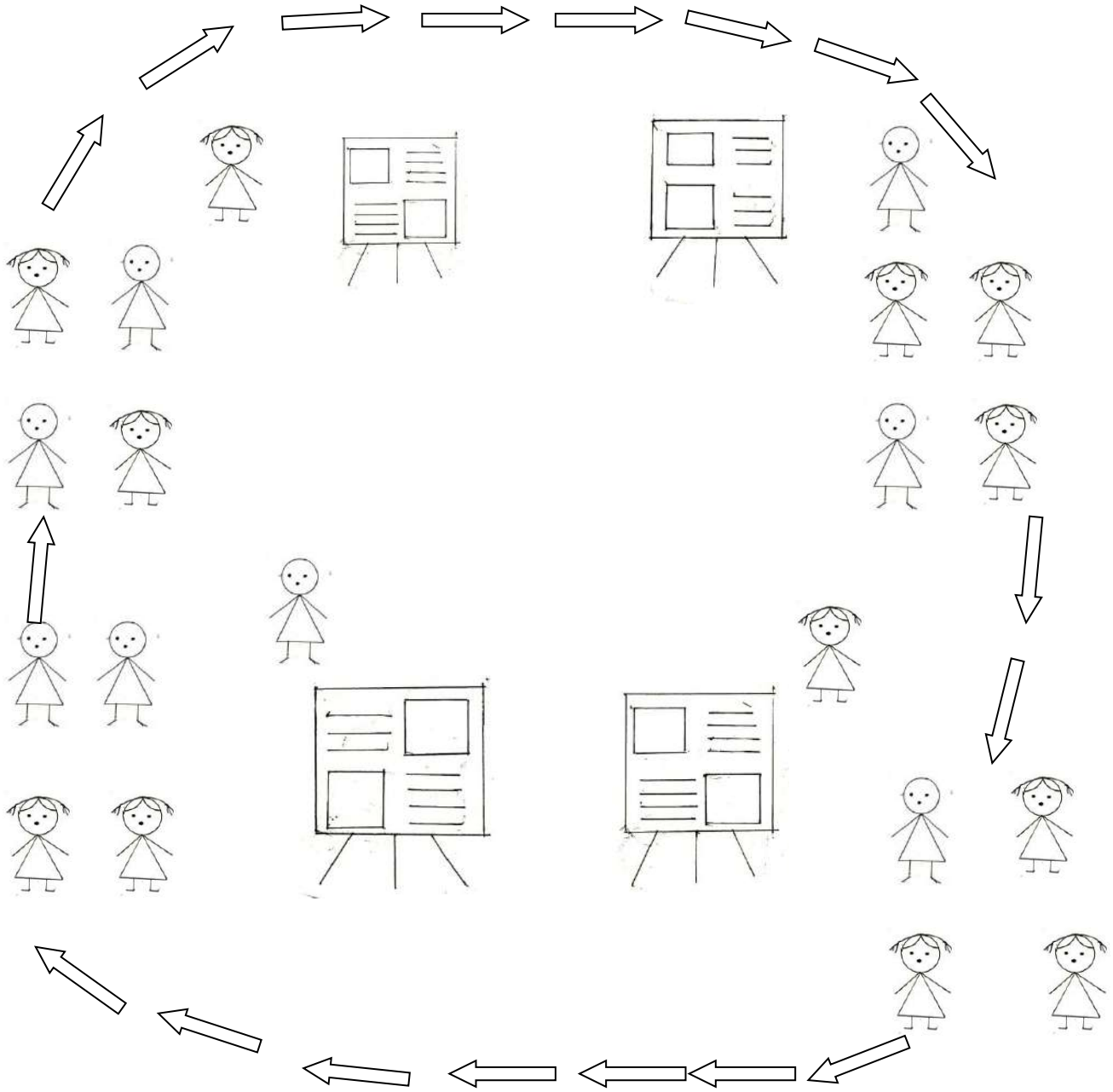
GALLERY WORK

1. Purpose : On the case of problem, concepts issue or debate
2. Context : Issues, debate
3. Location : Class room/ outside the class room
4. Settings : If in the class room, the desk & bench should be put it in the side of the class room and arrange to the space for exhibit the chart and there is some space to walk around the class room.
5. Steps through images :

Step I : Arrange the students into groups





Role : one person represent each group each present the summarized forum or report of the group discussion.

Illustration : Problem, concept, issue and debate each be illustrated by using Gallery walk. If take an example as concept ‘chemistry in every day life’. We can assign 4 chart on the basis of this concept. On the I chart posted about medical field, and the pupil discuss about in medical field what are the materials or technique related to chemistry. In II chart which is based

on Domestic field, III chart related to agricultural field and IV chart consist industrial field. On the chart, issues, photos questions etc, are include based on each field. And last all the basis of exhibition pupils from each group summarize the concept related to what he see, and club all four concepts. And make a report on the basis of chemistry in everyday life and make a presentation.

Gallery work is a discussion technique that gets students out of their chairs and into a mode of active engagement. That advantage of the method is its flexibility and the variety of benefits for students and instructor alike. A gallery walk can be conducted with computers, with piece of paper on tables, or with posted chart paper. It can be scheduled for fifteen minutes (a gallery run") or for several class periods. For students it's a chance to share thoughts in a more intimate, supportive setting rather than a larger, anonymous class. For instructors it's a chance to gadge the depth of student understanding of particular concept and to challenge mis conceptions.

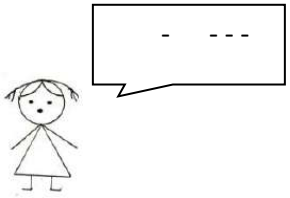
In Gallery walk student teacher rotate to provide bulleted answers to questions posted on charts arranged around the class room. Students from as many groups as there are questions, and each group moves from question to question, hence the name 'walk'. After writing the group's response to the first question the group rotates to the next position, adding to what is already there. At the last question, it is the group's responsibility to summarize and report to the class. This technique is closes with oral presentation or report out' in which each group synthesizes comments to a particular question.

Gallery walks works best with open ended questions that is when a problem, concept, issue or debate can be analyzed from several different perspectives. Gallery walk was the additional advantage of promoting co-operation, listening skills and team building.

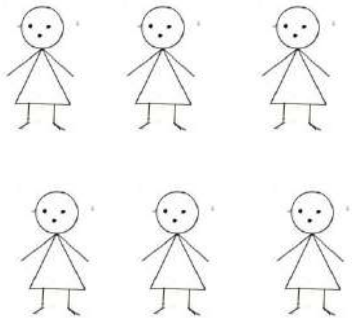
GUESS THE FIB

1) Purpose : which is a game, facts
2) Context : find out whether a state
3) Location : Class room
4) Settings : arrange the pupil in teams by taking numbers or bench wise
5) Steps through images:

Step I – One student state two rather unbelievable acts and one believable fib and we announced all three statements are facts.



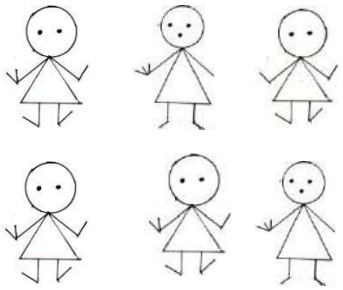
Student



teammates

Step-II

Teammates guess the fib using figures response



6) Role: each can guess and find their own answers
7) Illustration:

This can be played either within teams or within the class. When played within teams, participants try to fool their teammates, when played within the class, teams try to fool other teams. The idea is simple. In guess the fib students states two rather unbelievable faults and one

believable fib. They announce all three as faults, and it is the job of the teammates, or other teams to guess which one is the fib. Figure response can be used with guess the ib. students simply hold up one, two or three figures, depending on which statement they believe is the fib.

TALKING CHIPS

This is a method to ensure equal participation in discussion groups. Each member receives the same number of chips (or index cards, pencil, pens etc.). When students participate in the group discussion, they place a talking chip in the centre of the table. Once individuals have used up their chips, they can no longer speak. The discussion proceeds until all members have exhausted their chips. Once students have used the talking chips, one student summarizes the conversation. The team devides up the talking chips in the centre of the table and continuous the conversation using the chips until time is called.

The use of talking chips encourages all students to communicate their ideas and be active and attentive listeners. It ensures that all students voices are heard during co-operative learning discussion.

VALUE LINE

A value line as certain student's opinion in a quick and visual way by asking them to line up according to how strongly they agree with a statement or proposition.

The teacher presents an issue, topic or question to the students. Then the teacher assigns a value scale to each possible student response. For eg. The teacher might introduce a 1-10 scale where 1= strongly agreement 10= strong disagreement. Students all then asked to form a line based on how they rank their response based on the scale. After students line up, the teacher guides a discussion about the topic. After discussion consider having the students reevaluate where they wish to stand in the line. An alternative to value line is to ask post four answers to a question and then student go to the corner that best represents their answer perspective.

ROUND ROBIN BRAINSTROMING

Purpose

It is a form of discussion which enables the group to do collective creative thinking.

Context

Discussion

Location

Class room as well as outside the class room

Settings

- Forming groups with 4 or 5 members and sit in round.
- A person appointed as the recorder
- A question is posed with many answers
- Students are given time to think about answers. (think time)
- Team members share their responses with one another round robin style.
- The recorder writes down the answers of the group members.

Role

- Students have dominant role
- Teacher only dividing the student into groups.

Illustration

- Open discussion based on social issues, such as: pollution, deforestation, etc..

THINKPAD BRAINSTORMING

Purpose

i. Students are able to express their ideas and opinion in a small setting on paper
ii. There is equal participation

Context

i. Brain storming
ii. Express an idea about an issue
iii. Creating a story
iv. Collection of ideas
v. Sum up key points of whole class discussion

Location

Inside a classroom, a group discussion about less than 10 members

Settings

Students should sit around a table, provided a sheet of paper and a pen.

Steps

i. Students brainstorm individually
ii. Writes their ideas on a steel of paper (think pad)
iii. Announcing them to teammates and placing them in the centre of the table.

Role

There is equal participation, No special roles.

Illustration

In a group discussion about a topic like ‘usage of chemical fertilizer’ each students can express their own ideas (for organist usage of chemical fertilizer) through think pad brainstorming.

FIND THE FIB

Purpose

i. Can be used for evaluation
ii. To check previous knowledge
iii. Develop the skill to find the fib within a set of statements.

Context

i. Evaluating the students after the discussion in classroom.
ii. Before starting of the lesson checking previous knowledge.

Location

Inside the classroom, students at their proper position

Settings

No characteristic settings, Teacher can supply the statements through a activity card or Teacher can write the statements on the black board.

Steps

i. Write two correct statements about a lesson and one fib
ii. Asks students to tell which one is the fib and why?

Role

There is no special role. Each students can be evaluated.

Illustration

After teacher the lesson on 'Acids' teacher can write following statements and ask students to find the fib?

i. Acids have sour taste
ii. Acid develop pink colour while adding phenolphthalein
iii. Acid convert blue litmus to red colour

Fib: Acid develop pink colour while adding phenolphthalein

TEAM LINE UP

Location

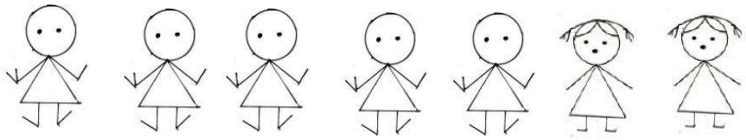
Inside the class room, out side the class room

Settings

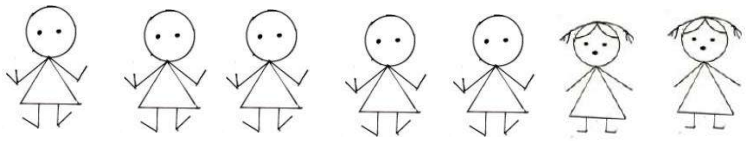
1. Teacher describes how students should line up
2. Students must find out where they stand relative to classmate
3. Students may talk to a partner next to them to share how they feel about their possession in the line up.
4. The teacher may then call for a different line up

Step through images

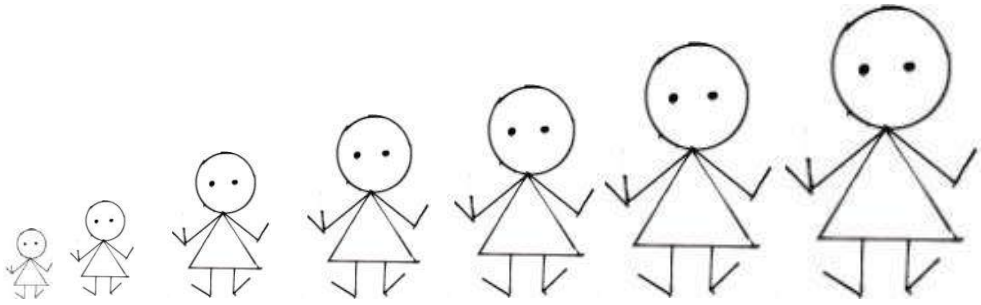
1. Students should line up and find out where they stand relative to class mate



2. Students talk to a partner next to them



3. Then teachers call for another different line up



Role

- Teacher given the suggestion
- Students are the dominant

Illustrations

Have each students on a team choose a rock from a collection and fell them to line up from the smoothest rock to the roughest rock. 4 rocks carier than 30 rocks to playing in this type of sequence.

TEAM PAIR SOLD

Purpose

It is designed to motivate students to tackle and succeed at problems which initially are beyond their ability.

Context

To solve complex ideas, sharing different ideas, experiments, solve complex problems.

Location

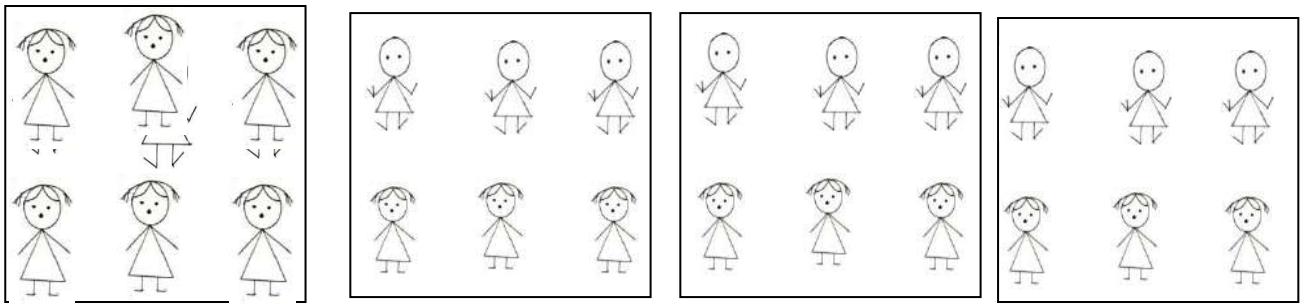
Inside the class room, science lab

Setting

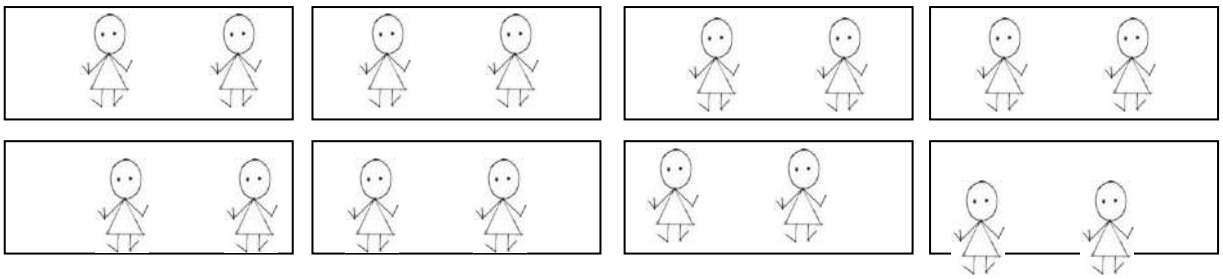
Students do problems first as a team, then with a partner and finally on their own

Steps through images

1. Place students into groups of four or more and solve problems



2. Place students into pairs of different groups and solve problems



3. Students solves the problem by themselves

Role

- Students have dominant role
- Teacher only give the suggestions

Illustrations

Step I

- The learners are divided into five groups
- Different bottles containing acids and alkali, blue litmus paper are distributes in each group
- Experiment worksheets also provided
- Discuss and experiment in each group and conclude their ideas on acid and base.

Step II

- Learners are divides into groups, each groups containing two members
- Providing opportunity to each group to conduct the experiment
- Each group conclude their ideas on acid and base

STEP III

- Learners are asked to conduct the experiment on acids and bases individually.
- Each one conclude their ideas about acids and bases by experiments.

CIRCLE THE SAGE

Purpose

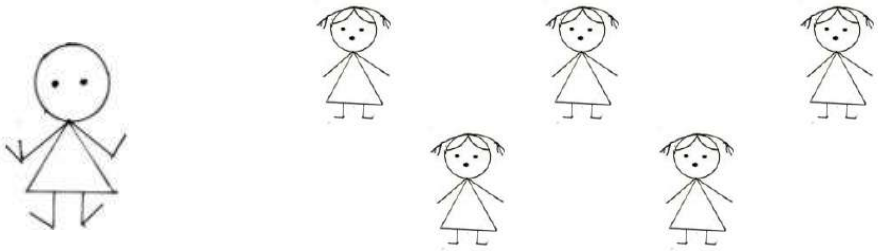
It gives interaction with more able members in the class. This structure is a great way to address group questions.

Location

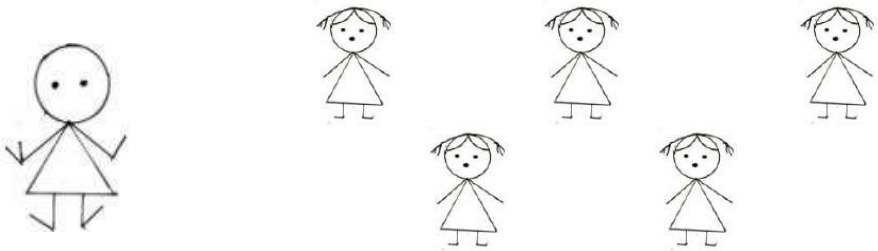
With the class room

Steps and images

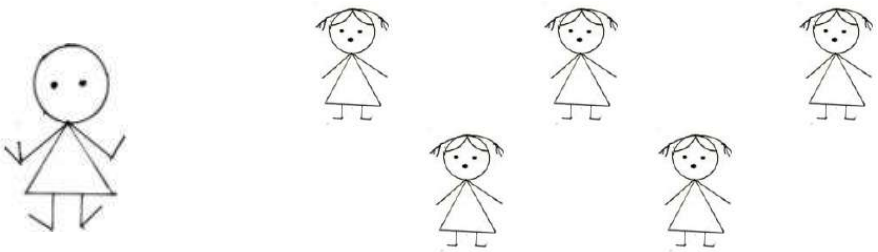
1) A question is posed by the facilitator



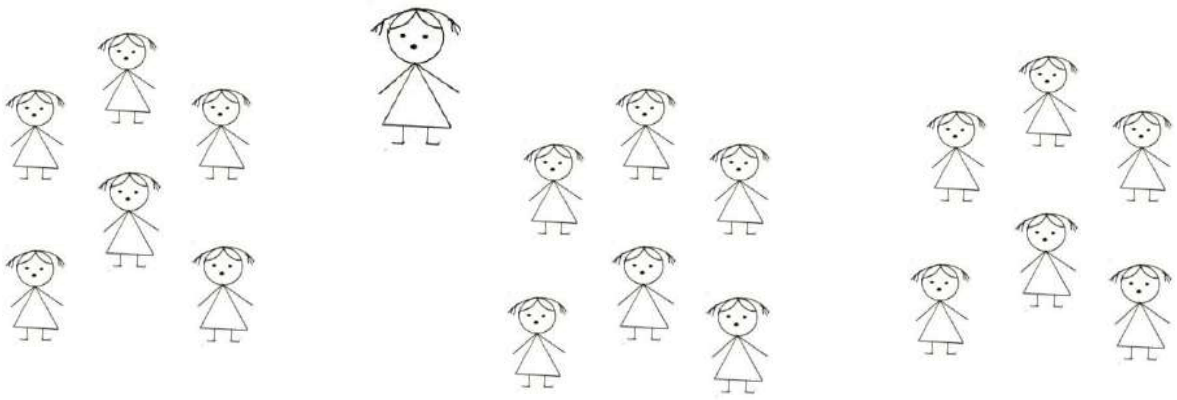
2) The facilitator asks for 3 or 4 sages who feel they would answer the question



3) The sages move to different locations in the class room. Participants divides them selves equally around different sages.

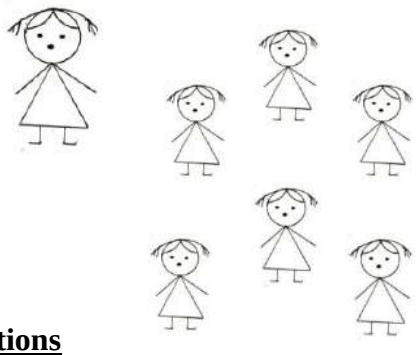


4) Sages answer the questions



5) Participants thank sage for sharing knowledge and return to teams

6) Participants share learning with team



Illustrations

What is Acid?

Role

Teacher is a facilitator. Some students are sages for that question. They do not need to be experts just have information to share.

SEND A PROBLEM

Purpose

It can be used as a way to get groups to discuss and review material or potential solutions to problems related to content information. It can be also used for evaluation process.

Location

Within the class room

Situation

For revision and evaluation process

Steps and images

1) Each member of a group generates a problem and writes it down on a card. Each member of the group then asks the questions to other members
2) If the question can be answered and all members of the group agrees on the answer, then that answer is written on the back of the card. If there is no consensus on the answer, the question is revised so that an answer can be agreed upon.
3) The group puts a Q on the side of the card with the question on it and an A can the side of the card with an answer can it.
4) Each group sends it question cards to another group.
5) Each group member takes ones questions from the stock of questions and reads one question at a time to the group. After reading the first question, the group discuss it. Ifd the group agrees on the answer, they turn the card over over to see if they agree with the first group's answer.

   If there again is consensus, they proceed to the next question. If they do not agree with the first group's answer; the second group writes their answer on the back of the card as an alternative answer.

6) The second group reviews and answers each question in the stock of cards, repeating the procedure outlined above.
7) The question cards can be send to a third, fourth, or fifth group if desired.
8) Stocks of cards are then sent back to the originating group. The sending group can then discuss and clarify any questions.

Role

Role of children's are more important. Here each members of a group can generate a problem. Teacher is just a guide or facilitator

ROUND TABLE

It is a simple co-operative learning structure that cover much content, builds team spirit and in corporate writing. Each student in turn writes one answer as a paper and a pencil are passed around the group with simultaneous round table more than one pencil and paper are used at once.

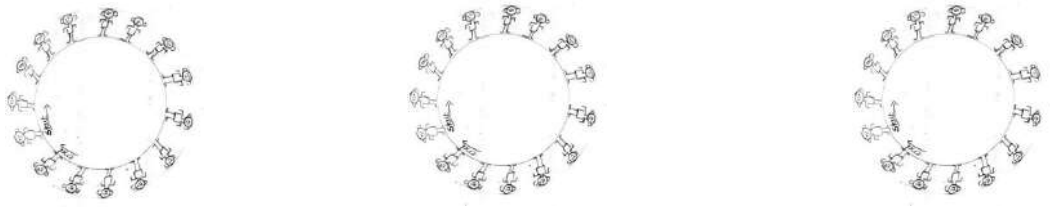
1. Purpose
   - ✓ Accessing prior knowledge
   - ✓ Practicing skills
   - ✓ Re-calling informations
   - ✓ Creating co-operative art teat building
   - ✓ Participation of all
2. Context
   - ✓ Sharing ideas
3. Location

   This type co-operative learning can easily be used with the class room.

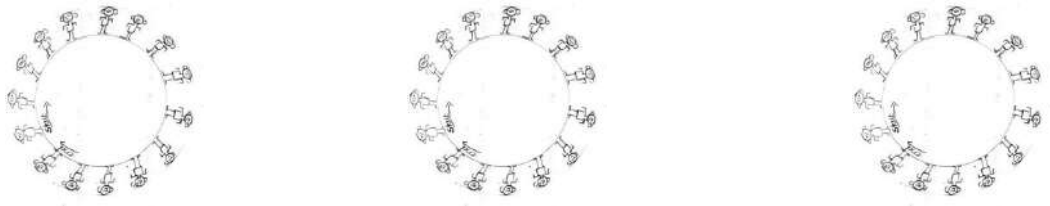
4. Settings

   Divides students in to groups . Then teacher passes a question that has multiple answers. Each student in turn writes one answer as a paper and a pencil are passed around the group with simultaneous round table more than one pencil and paper are used at one.
5. Steps through images

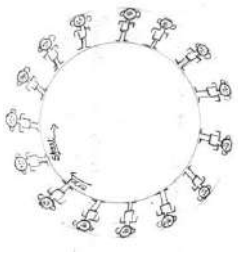
   Step I : In the 1st step the teacher passes a question that has multiple answer.



   Step II: The 1st student in each group writes on responses on a paper and pases the paper counter clockwise to the next student.



Step III: Finally in step 3, teams with the area test no. of correct response gain some type of recognition.



6. Role :
    - ✓ Students has a dominant role
7. Illustration:

    A teacher displays a picture and asks what are various food chains found within the ecosystem of the picture. One student writes a food chain on a piece of paper the n passes the paper tp other members of the team for them to write a food chain that they see in the picture students continue to pass around the paper until the teacher stops the activity or until a group rans out of answers.

NUMBERED HEADS TOGETHER

Purpose : (1) Problem solving through cooperative learning

(2) Improve cooperation among students

Context : (1) Revision Time

(2) solving problems in text books

(3) Finding solution to social issues

Location : Classroom

Settings : Seating arrangement should be done in such a way that Members of each group can discuss their ideas Conveniently

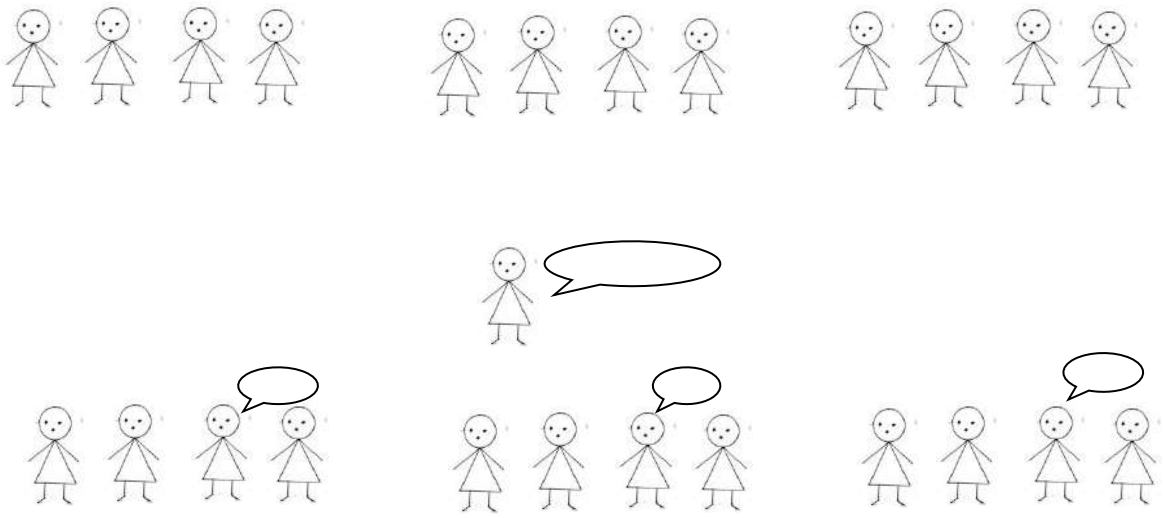
Steps : (1) Make teams of four students and number each student in the group (1,2,3,4)

(2) A question is asked to each group

(3) Students discuss the question in their group and make sure that each number of the group is able to verbally answer the question

(4) The teacher calls out a number

(5) Student with that number raise the hand and answer the question



Role: Teacher provides problems for discussion

Students discuss the problem and construct their own answer and present the answer.

JIGSAW

Description

The Jagsaw method is a co-operative learning technique in which students work in small groups.

Purpose

Acquisition and presentation of new material review informed debate.

Location

Classroom

No. of Student

According to the no. of students

Steps

I. Divide students according to the no. of sub topics. This group should be diverse in terms of gender and ability

II. Expert from different group meet together

III. After discussing/ gathering information students back into their Jigsaw group

IV. Each student present his/ her topic while other students from the same group ask question for classification

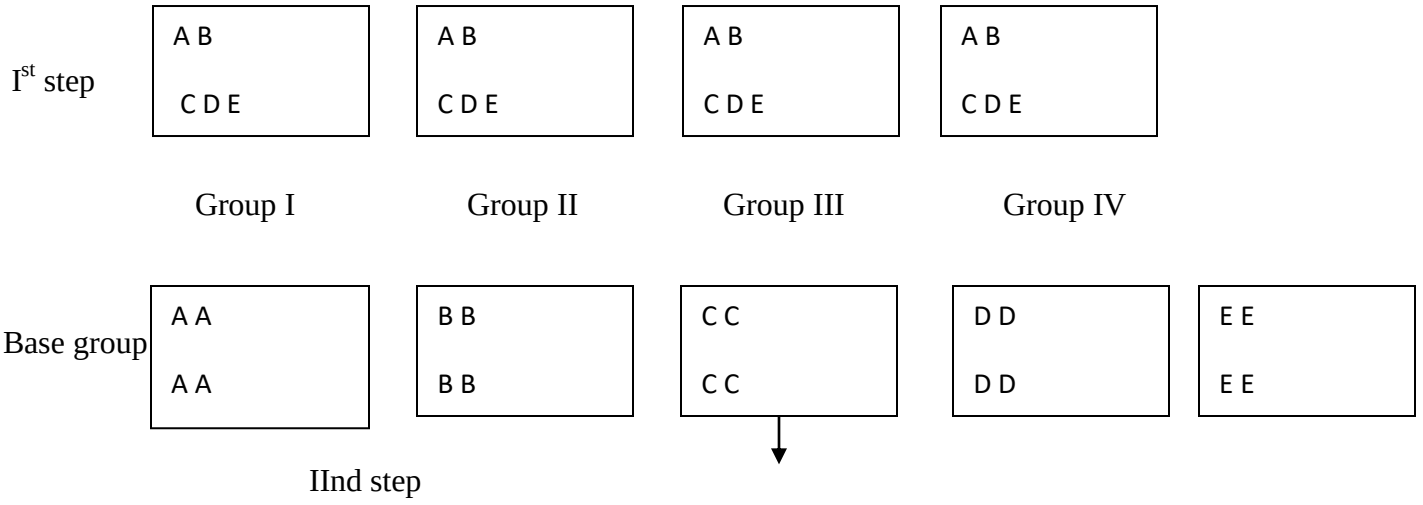
Role of a Teacher and Student

1) Teacher

   Divide sub topics and divide students

2) Student

   Learn their expert area thoroughly and beach other students to the same group



MERIT

Encourage listening, engagement and empathy by giving each member of the group and develop interaction among all students on the class

CIRCLE

Purpose

For organizing group work

Location

Hall / one side of the class room

No. of Student

Depends on the nature of work

Steps

1) **Organization of the circle**

   Unit student with diversity of perspectives and opportunities for interaction with other student.

2) **Opening the Circle**

   Circle open with activation to build trust and cohesion

3) Shared work on the project and working on the work

4) **Sharing the ont come**

   Exhibitions or sharing of completed work leads to the end of the circle

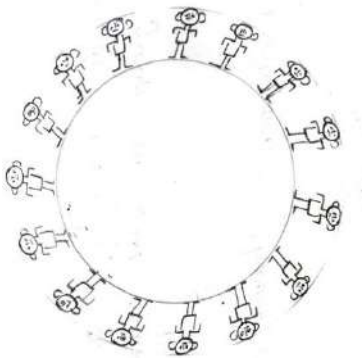
Role of a Teacher and Student

Teacher

Act as a media for Guide

Student

Build share and express knowledge through a process of open dialogue and deep reflection around issues or problems with a focus on a shared ontcome



Merit

Developing trust, openers, reciprocity and fostering both listening and speaking skills among peers.

INSIDE OUTSIDE CIRCLE

Purpose

Summarization technique, provides a way to get student who normally would not talk to interact with others.

Context

Review phase, sharing ideas, evaluation

Location

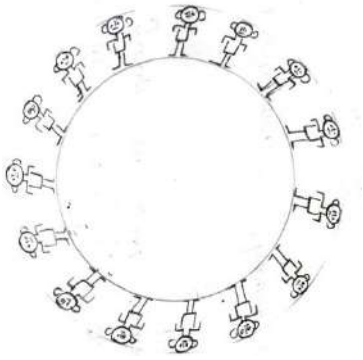
Outside the class room

Settings

Divides into two groups, students are placed in two circles. Students in the inner circle face outwards, directly facing another student in the outer circle. This strategy enables discussion between students while encouraging movements and interaction. Half of the students stand up and form a circle with their backs to the inside of the circle. They are partner A. the either half of the students form a circle facing a partner from the first circle. These students are partner B. partner A will speak first, quickly summarizing what they read. This take about a minute. Then partner B speaks for the same length of the time, adding to the summary. If the teacher stands in the centre of the circle, he or she can easily monitor student responses. Now it is time to move. Have the students who are partner A raise their right hands and then move two people right to meet with a new partner. Repeat the summary with partner B speaking first for the third move, have all students who are partner B, raise their right hand and move two people to the right. After they are with a new partner, they continue with a summary with partner A speaking first. Depending on the size of the class, teachers may have students move more or fewer times to complete the activity.

Steps

1) Divides into two groups, group A & B
2) Students of group A are placed in the inner circle face outwards and students of group B are placed in the outer circle face inwards
3) Stand in face to face & sharing ideas
4) Teacher stands in the centre of the circle & monitor student responses.



Role

- Student has dominant role
- Teacher monitors student responses

Illustration

Teacher giving a topic how pollution can be controlled students in the class share their ideas and teacher monitors their responses. Inside outside circle holds all students accountable for having something to say.

THREE STEP INTERVIEW

Purpose

Effective way to encourage students to share their thinking, ask questions and taking notes.

Context

Review phase, getting opinions, formulating hypothesis, communication

Location

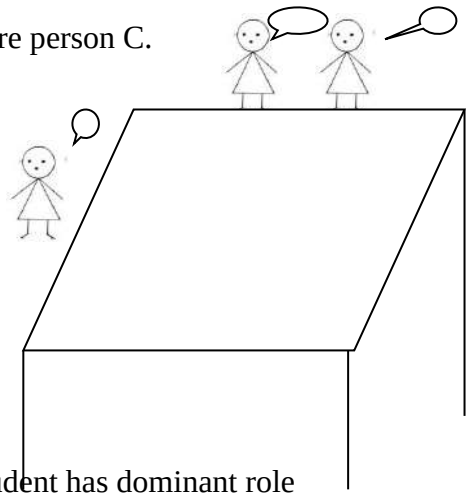
Inside the class room

Settings

Divides students into groups of three. And separate them as interview, interviews, and reporter, eg: A = interview, B= interviewer, C= reporter. After each interview rotate the roles. Then students do a round robin and share the key information they recorded when they were person C.

Steps

1) Place students into groups of three
2) Assign each student a letter and a role
   Eg: A= interviewer, B= interview, C= reporter
3) Rotate roles after each interview
4) Here students do a round robin and share the key information they recorded when thay were person C.



Role

- Student has dominant role
- To acher monitors students responses.

Illustration

Teacher giving a topic how pollution can be controlled. Students discuss in groups of three. Giving & sharing their ideas, communicating with others. Then they do a round robin and share the ideas when they were reporters.

THINK PAIR SHARE

Think pair share is a structure, that first developed by Prof.Frank Lyman at the University of Maryland in 1981. It introduces into the peer interaction element of co-operative learning structure, which has been demonstrated to be powerful factors in improving student responses to question.

It is a three step co-operative learning structure

1. Teacher gives the students to think time and directs them to think silently about the question
2. Following the think time, students turned to face their learning partner and work together, sharing ideas, discussing, classifying and challenging
3. After pairing they share their ideas with another pair on within the whole class. It is important that student need to be able to share partners ideas as well as their own

This is a good technique for breaking up a presentation as well as an assessment of student understanding

Purpose

- Processing information
- Communication
- Develop thinking

Context

- Making predictions about an experiment
- Discussing the results of an experiment
- Taking over charts and groups
- Developing a concept through discussion

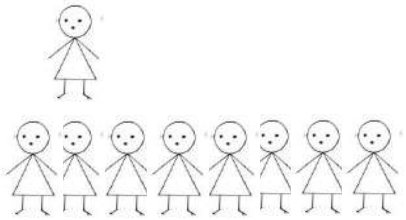
Location

Class room

Settings

There is no special setting of arrangement. Each pair is by thing in face to face and they share their ideas about the topic

Steps through images



Role

Here the teacher's role is to ask a question or given to the topic for thinking pairing and sharing. Each members of the pair thus no separate roles. Both are share their ideas about the topic.

Illustration

First the teacher asks the student to think silently about the topic energy (for testing student's previous knowledge) and he gave time for silent thinking. After the silent thinking each student of the class share their ideas about the topic to other student or the student sitting near to him ie his pair. Both are discuss the topic and they share their ideas. After the pair discussion they share their ideas with another pair or within the whole class.

In silent thinking each student think about energy.

Energy is the capacity to work

It's unit is Joule

} First student's thinks

There are two types of energy ie K.E & P.E

If an objects get's energy due to motion is called K.E

If an objects get's due to position & strain is called P.E

} II^{nd} srudent's think's (pair)

In the pairing stage both the students share their ideas. After pairing they share their ideas with another pair or within the whole class.

THREE STAY ONE STRAY

The designated student who is welcomed as a visitor, shares with this new them the results of his original group discussion, giving proposed solutions to problems or summarizing discussions. A second rotation may be desirable if the topic prompted divergent thinking and solutions.

Three stay one stray offers a law thread forum where student can exchange ideas and build skills such as asking problem questions. It also offers students the opportunity to learn by teaching. Placing the report out responsibilities on the students reinforces the valuable conception that knowledge resides within the learning community, not just with the "authority figure" in structure. Perhaps is greatest values lies in its efficiency. Instead of four example, ten sequenced live minute reports to the entire class (fifty minutes + transaction time) individual students are simultaneously giving five minute reports through out the room.

It is a three step co-operative learning structure

1. Forming the group with 4 members
2. From each group they select one spoke person
3. Consider spoke person as stray and they are going to another group for discussing

Purpose

- Processing information or exchange ideas
- Communication
- Build social skills such as asking problem questions
- Develop thinking

Context

To solve problems

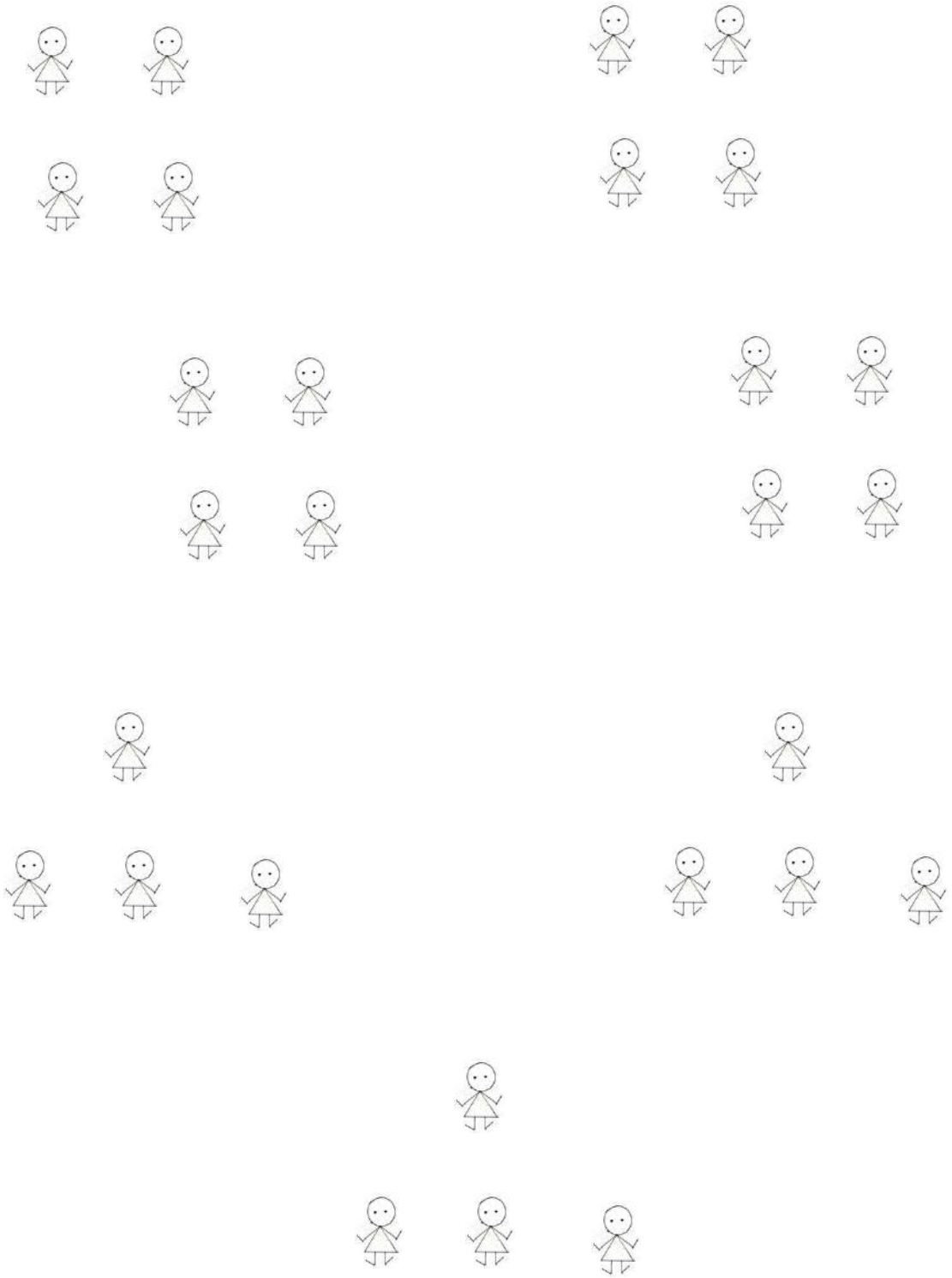
Location

Class room

Settings

Each group thus four members. So these four members are sitting together in the class

STEPS THROUGH IMAGES



THREE MINUTES REVIEW

Purpose in	:	(1) Reviewing the topics and issues that are discussed the class room (2) Helps students internalize what they are learning
Context	:	This can be done during the time of normal classroom teaching
Location	:	Class room
Settings	:	Normal Classroom arrangement
Steps	:	(1) Teacher stop at any time during a lecture or discussion (2) break up students in to teams (3) Students discuss and review the topic or issue for three minutes. Students in their groups can ask a clarifying question to the other members or answer questions of others.

T-Teacher S-students

TM1-Team1, TM2-Team2, TM3-Team3

ROUND ROBIN

Purpose

This structure is designed to give every one in the group an equal chance of participation

Context

Review, Evaluation, sharing ideas

Location

Out side the class room

Settings

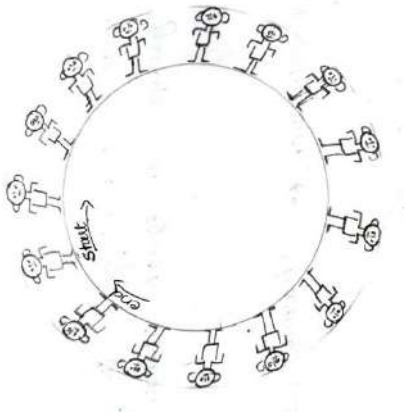
Students sit in round position

Everyone in the group an equal chance of participation starting with one participant, each person gets 1-3 minutes going clockwise or anticlockwise to present their points.

Steps through images

Students sit in round position

Students express their views in clockwise or anticlockwise direction



Role:

Student dominant

Illustrations:

Learners sit in rounds and sharing their ideas. Through this activity learner understand the importance of energy conservation.

CORNER

Purpose

Corner method of co-operative learning can be used to have students express and listened to various opinion on topic, critical thinking and self expression skills

Context

Debate, opinion type

Location

Inside the class room

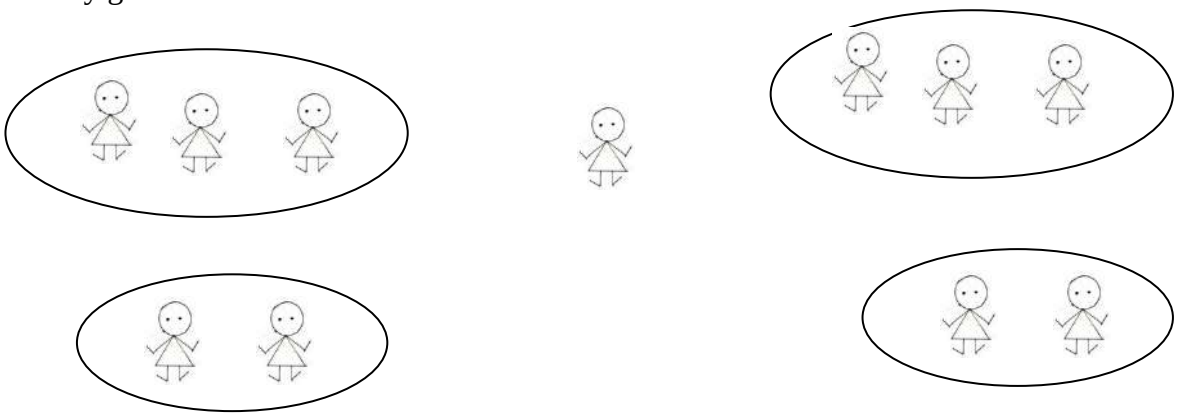
Settings

Divide into groups. The teacher announces the corner for the groups. Then participants think about their choices and write down their choices on a piece of paper. They go to the corner of their choices and talk with others in the corner why they choose it. When a spokesperson from the area shows with the whole group why they chose it. Then participants can then change corners. Then participants return to their tables and review their reasons.

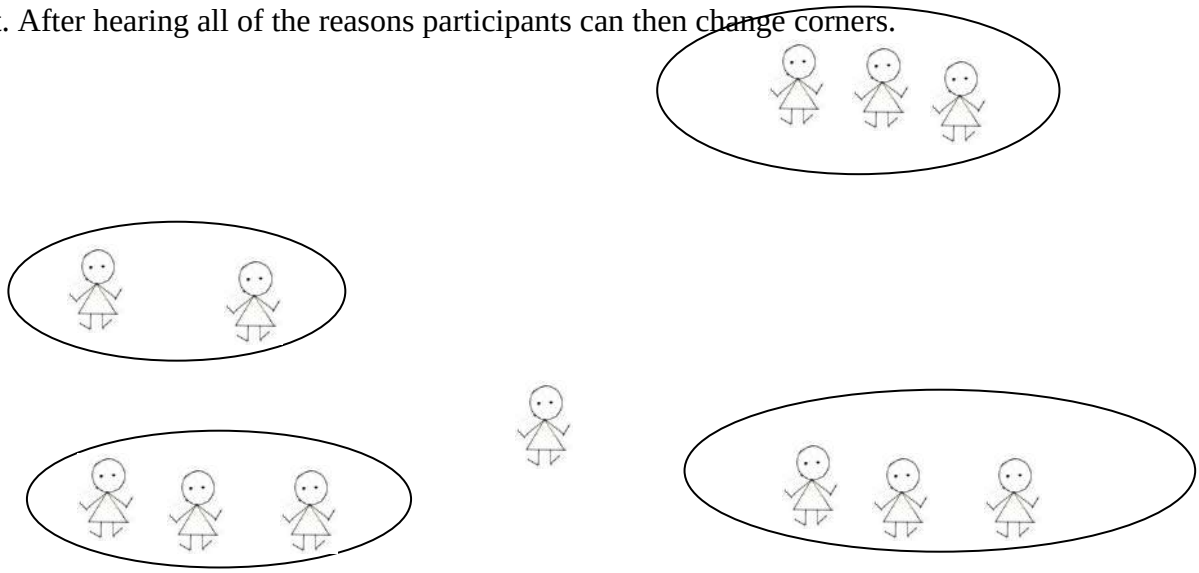
Step through images

- Teacher announces the corners

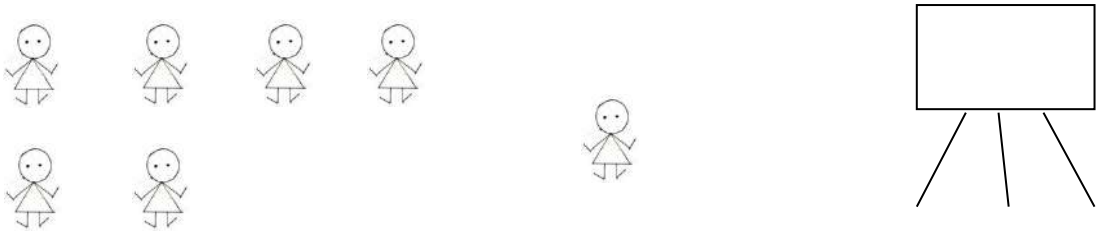
- They go to the corner of their choice



- They talk with others in the corner and also share with the whole group why they chose it. After hearing all of the reasons participants can then change corners.



- Participants return to their tables and review their reasons.



Role

- Student has dominant role
- Teacher monitors students responses

Illustration

Teacher giving a topic how energy can be conserved. Discuss in corners, giving and sharing their ideas, communicating with others. After hearing all of the reasons, participants can then change corners. All students return to their tables and review their reasons.

FOCUSED LISTING

Purpose : - To generate descriptions and definitions of concept from examples.

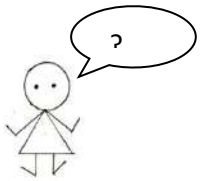
Context :- It is used in context where everybody knows about it and teachers can guide them to a new stage using the enlisted examples they have made.

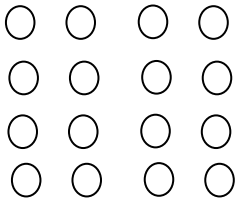
Location :- Both class and outdoor have equal opportunity.

Settings: - Pens, Papers, Black board, Chalk

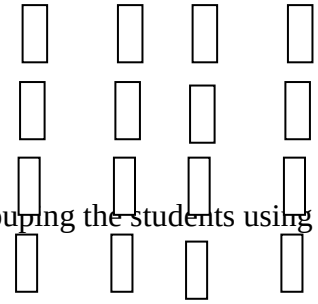
Steps

1. Teachers asks students to enlist about something.
   Eg:- Asks students to write about object moving situation.



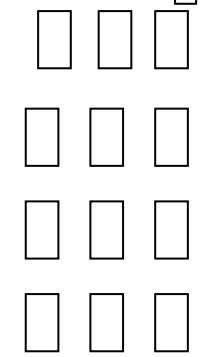


2. Each students enlist their own answers.
   Eg:- Students lists object moving situations.
   Moving car, falling water from tap, flowing water in river.

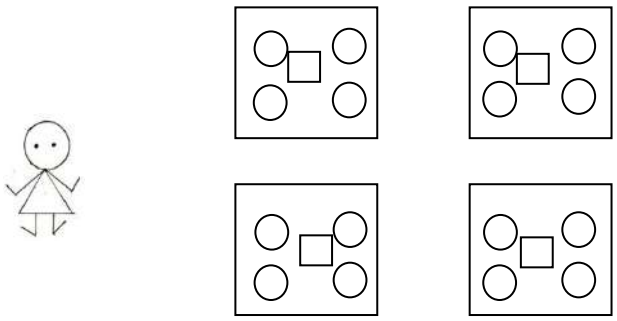


Student List

3. Teacher grouping the students using any method.



4. In groups students review each students list and comes up with a new list (focused list). Each group comes up with such a list.



5. Now each groups list will discuss in the whole class room and comes up with a final focused list.

Roles:-

- Each student should enlist.
- Group leader presents the focused list they have come up with
- Teacher gives the questions, grouping students etc.

Illustration

Enlisting the examples of Kinetic Energy

FORMATION

Purpose:- To understand/ Study about structures clearly by group activity.

Context:- Teaching structures nad working

Location :- Out side is more suitable

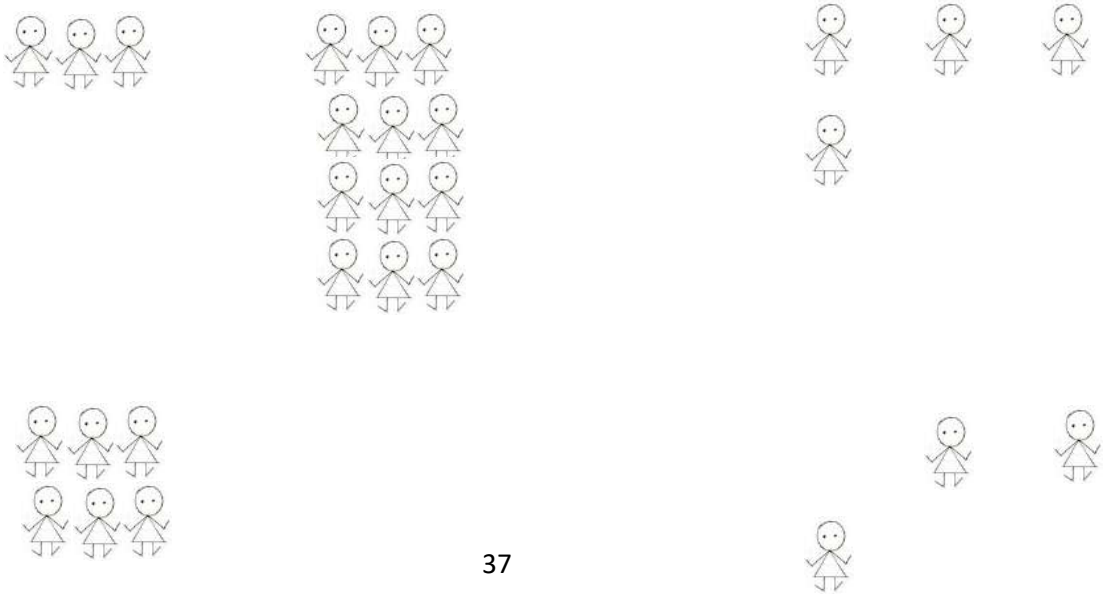
Settings:- Balck board and chalk

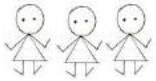
Student should in a position to move freely.

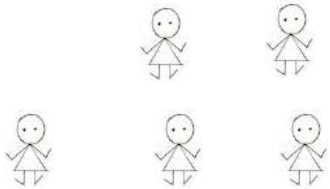
Steps Method 1

1. Teacher advises student to be in a particular position

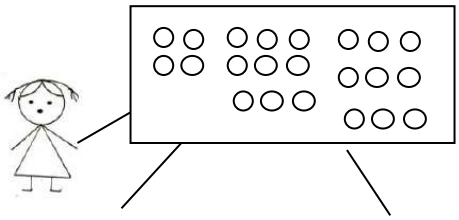
2. Students forms a structure

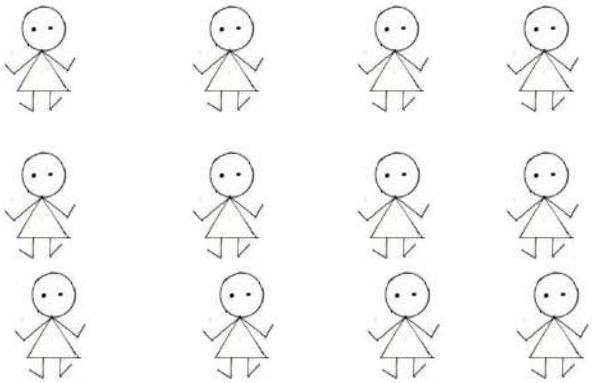






3. Teacher draws the structure on black board

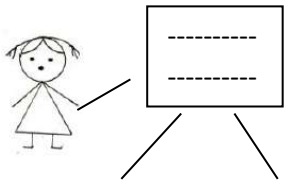


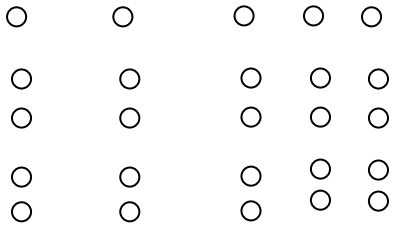


Method 2

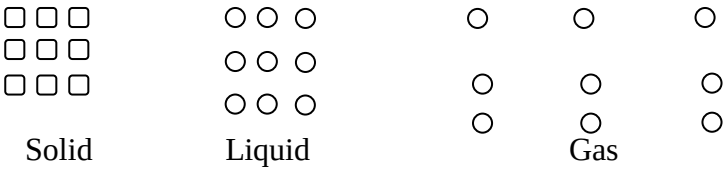
Steps

1. Teacher draws structure on the board





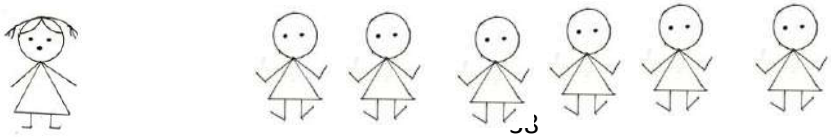
2. Students forms the structure



Solid Liquid Gas

3. Students understand the structure clearly

Illustration : - Teacher can implement thgis method to teach the conduction of heat in metals



Teacher Student

Considering students as molecules in metal

Role.

Students act according to the advises given by teacher.

Teacher gives direction.

TEAM WORD WEBBING

Purpose

- Higher order thinking skills practiced
- Ideas are connected, expanded
- Increase academic language and builds poor relationship

Context

Analysis of concepts in to components, understanding, multiple relations among ideas, differentiating concepts.

Location

Within the class room

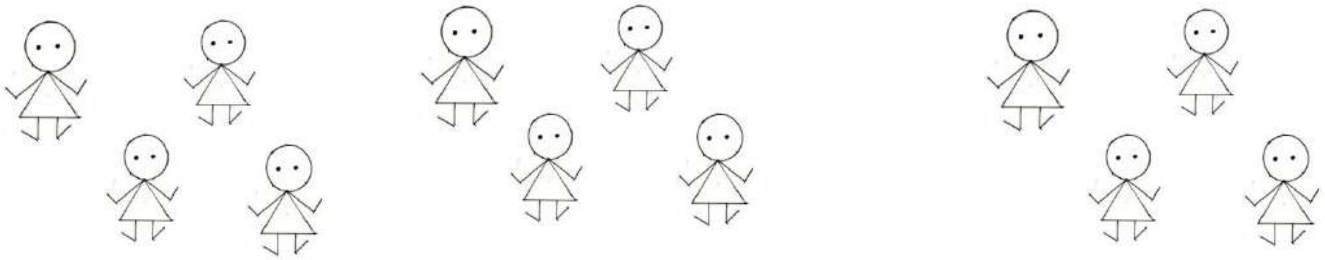
Settings

- Large piece of papers (chart paper, bulletin board papers cut into pieces etc.)
- Different coloured marker as pen
- Arrange the students in group base

Steps through images

Step 1:- Grouping round

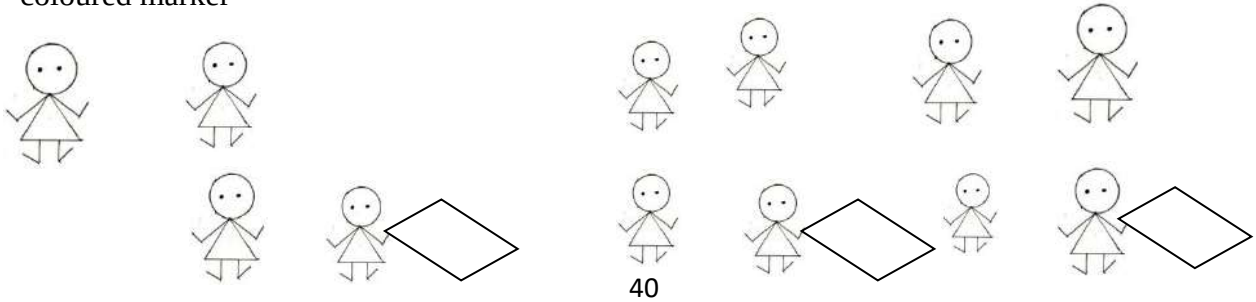
Teacher grouping the students in four or five members



Group-1 Group-2 Group-3

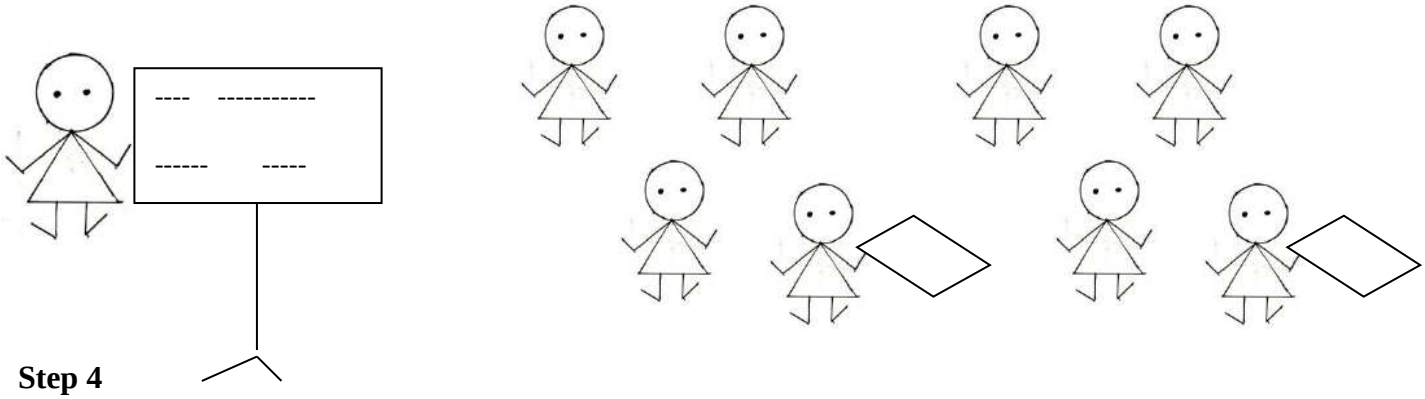
Step 2

Teacher provides each team with a single large piece of paper. Give each student a different coloured marker



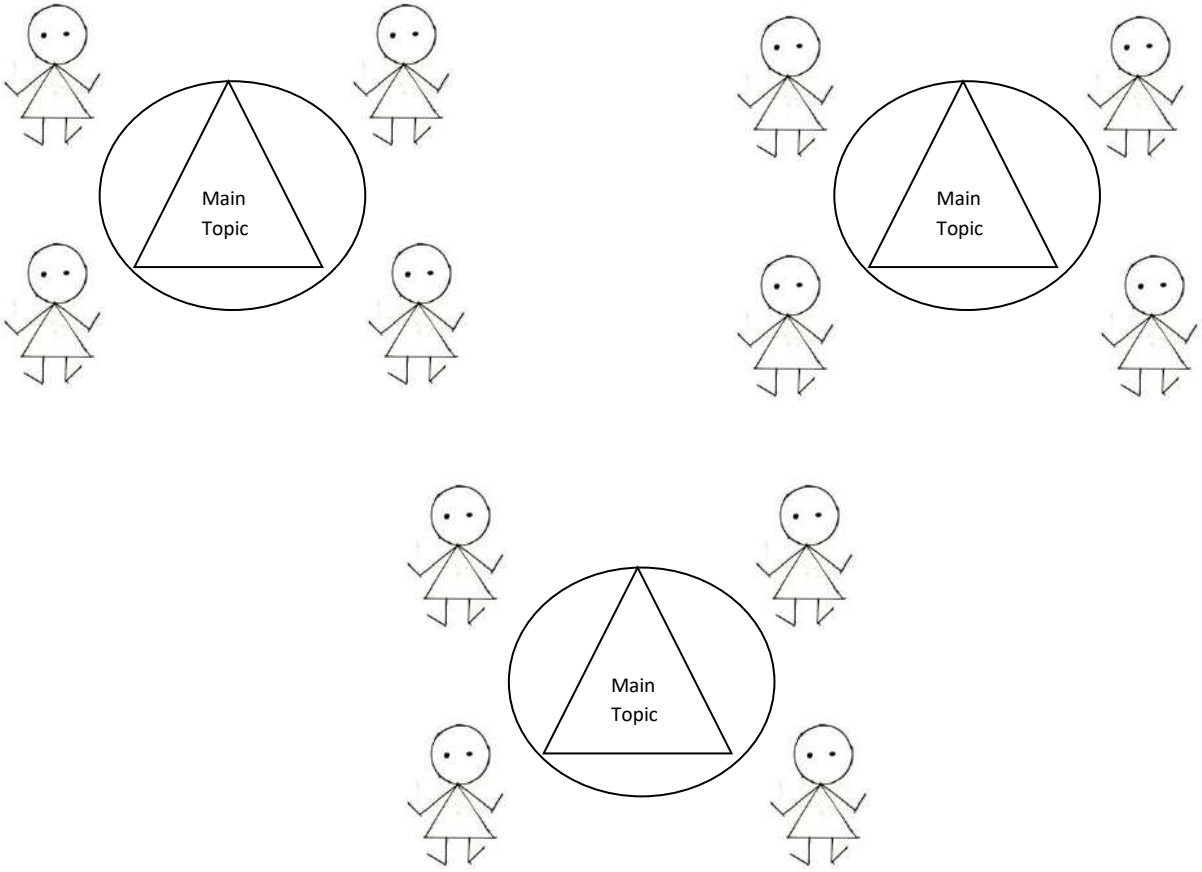
Step 3

Teacher assigns a topic for a word web, After the students write the care concept in a rectangle in the centre of the paper.



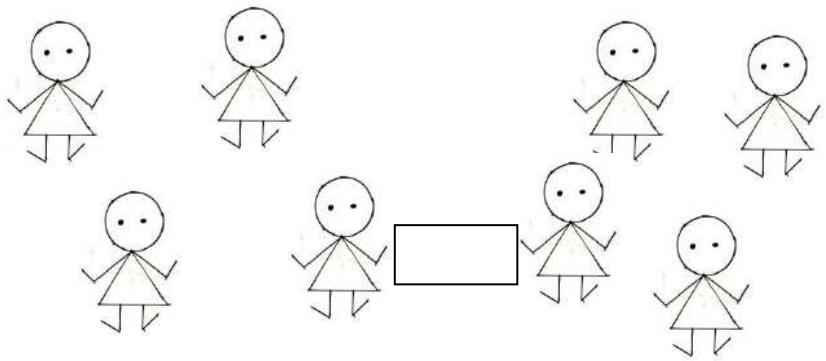
Step 4

Each student add to the part of the web nearest to him outer



Step 5 : Rotation round

Begin to freely add to the web or pass the poster from one person to person or group to group telling students to ad to the web. (here you can indicate whether they should be adding main concept , minor concept)



Step 6

At last stage connect and interlink the different concept or draw the concept map.

SLIP WRITING

Purpose:

To present a concept or summary

Content :

Characteristics, features or properties of any concept can be evaluated using this co-operative learning structure or we can present a concept using this

Location:

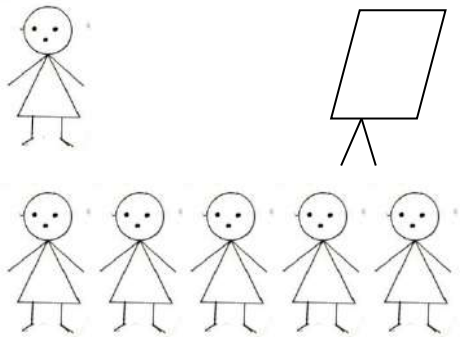
Inside the class room

Settings:

Slips and pen should be given to all pupil. The location should have enough space for grouping the pupils and sorting the slips.

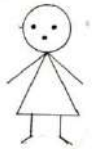
Steps:

1. A question or problem is posed
2. Each participant records answer on slips of paper. One idea per slip. No discussion is allowed . do it as an individual activity.
3. In small group all slips are viewer and sorted. Same ideas are put together .
4. Group categorizes and responses are shared whole class
5. The group leader draws the threads together and summary concept is presented

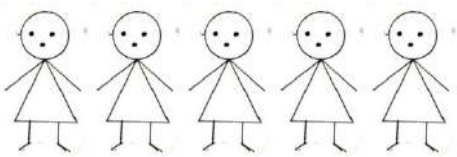


Question asked

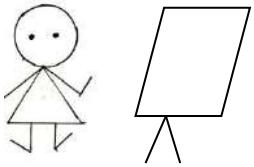
Individually writing slips



Sorting slips



Discussion among class



Leader present summary

Illustration :-

To present the concept – acid

1. Teacher asked to students to write the properties of tamarind or lemon
2. Students individually writes the properties
3. The slip will sorted in terms of matching and mismatching properties.
4. A discussion should done in the whole class to find the properties and there by defining it.
5. Finally the team leader defines the term acid and reaches the concept name acid

RALLY COACH

Purpose	-	To increase the communication skill
	-	pairing
	-	processing knowledge
Context	-	Evaluation process
	-	Problem solving
Location	-	Inside class room

Settings:-

Ralley coach is an exercise used to have pairs help each other solve problems in class with sincere , you could use this exercise to have students help one another solve euations

1. Have students get into pairs either using “stand up, Hand up, Pair up” or music
2. Partner A then solve the first problem on the handout
3. Partner B will watch then and listen as this is done, and then either coach if the problem is answered incorrectly or praise if it is right.
4. Partner B will then solve the next problem on the worksheet
5. Partner A will then watch and listen, check the answer and other coach or praise
6. The problem will then be repeated again starting at step 1

Steps : through images

Step 1: Pairing

Step 2: Partner A solves the problem while Partner B guides

Step 3: Partner B solves the problem while Partner A guides

Role : Teacher asks the problem to be solved

Student solves the problem

Student dominant

Illustration :

Balancing of chemical equations

STRUCTURED PROBLEM SOLVING

Purpose - Process knowledge

- Grouping

- To increase communication skill

Context - Discussion

Location - Inside class room

Settings:

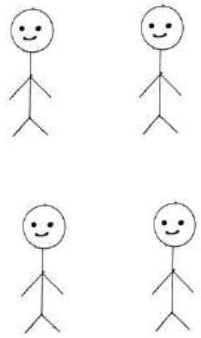
- Have the participants brainstorm or select a problem for them to consider
- Assign number to members of each group (or use playing cards). Have each member of two group to be a different number or suit
- Discuss takes as group
- Each member of the group needs to understand the response well enough with no help from other member of the group.
- Ask an individual from each group to respond. Call on the individual by number or suit

Steps

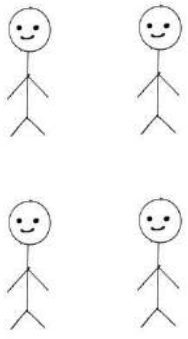
1. List all possible solutions even bad ones
2. List advantage and disadvantage of each solution
3. Choose best most practical solution or combination
4. Plan how to carry out solution
5. Read progress and review plans. Feel good about your efforts

Steps:

Step 1 : Discuss in groups



Group 1



Group 2

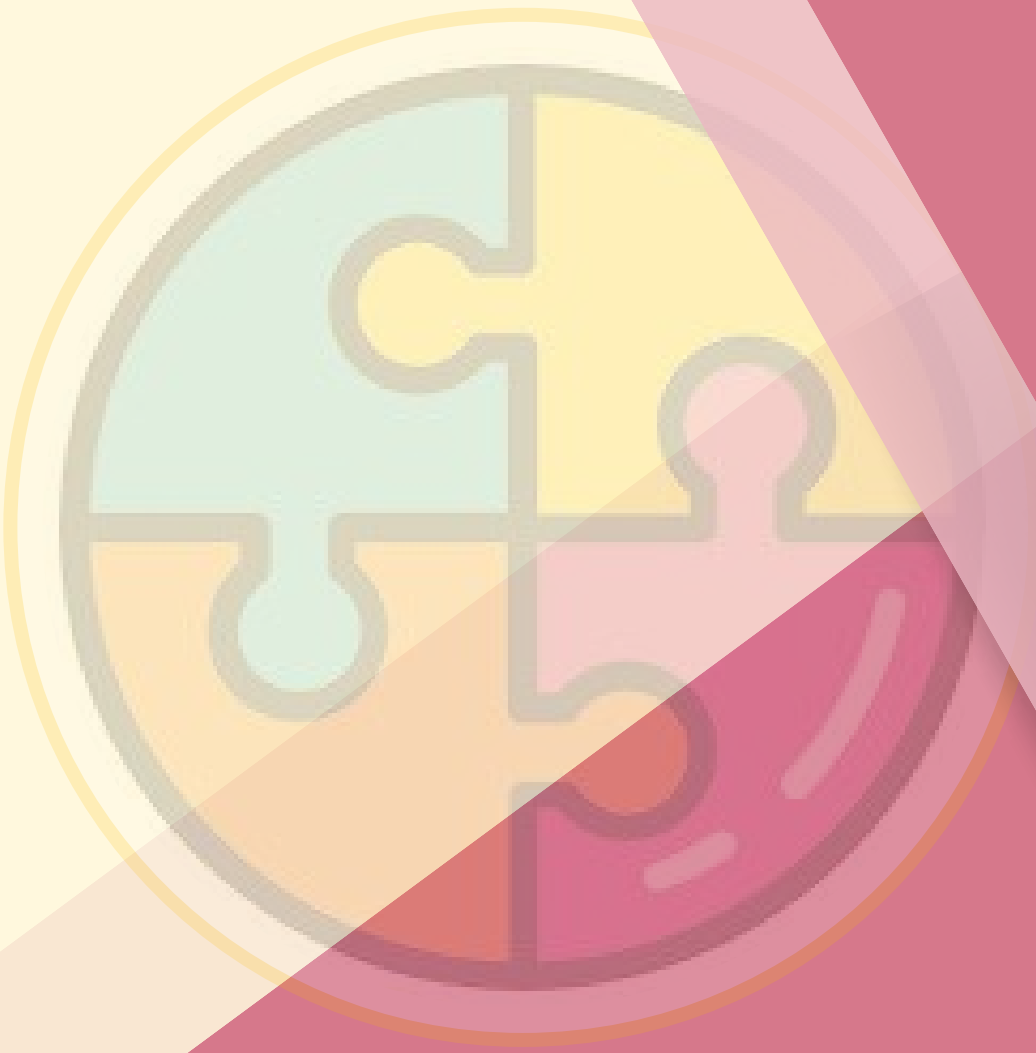
Step 2 : Call an individual by number to present the output

Role:

- Teacher posses the question, students solves the problem in group.
- Student dominant

Illustration

CO-OPERATIVE LEARNING STRUCTURES



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