



How to ask good questions

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HOW TO ASK GOOD QUESTIONS?

EDITORS

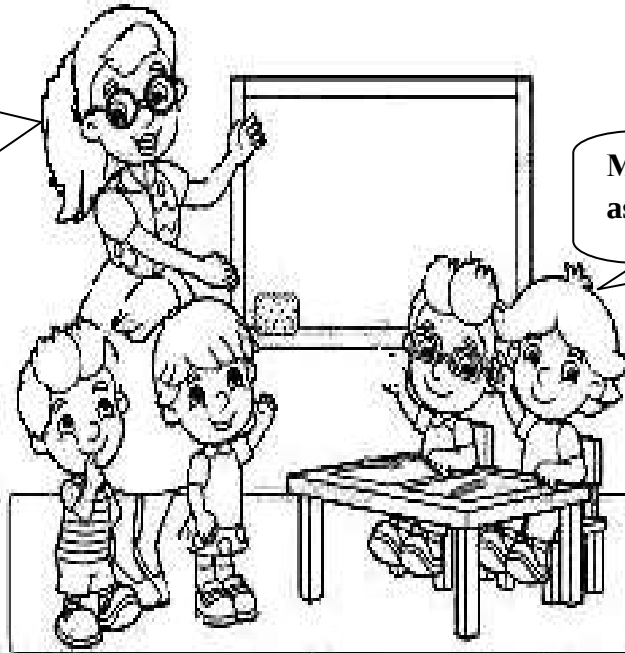
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THE LITTLE SCIENTIST'S CLASSROOM



Ok.....children,
today I will tell you
about how to ask
good questions.



Mam...why we should
ask good questions?

Do you know about Isidor I Rabi ?



Yes....I know. He is a great scientist
who was awarded with Nobel Prize in
physics

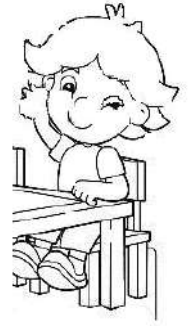
One day a friend asked Rabi,
“Why did you become a
scientist rather than a doctor
or lawyer or businessman”



Then what was his reply.



Rabi responded "My mother made me a scientist without ever intending it. After school when I reach home she always asked me a different question"



What may be that question



Mother asked Rabi "Izzy, did you ask a good question today"...

Asking good questions made him a scientist



So as little scientist, Children.... you should ask good questions.



To ask good questions, first you
should know about the
different types of questions.
ok.....children



DIFFERENT TYPES OF QUESTIONS



OPEN ENDED QUESTIONS AND CLOSED ENDED QUESTIONS



First we can learn about the simple type of classification.

Questions can be classified into open ended and closed ended questions

Mam , what is the difference between open and closed questions



A closed question can be answered with either a single word or a short phrase. Closed question can be answered with either 'yes' or 'no'.

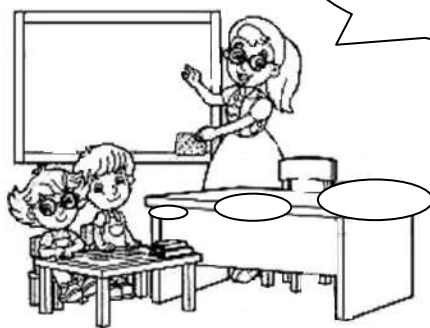
Closed questions have the following characteristics

1. They give you facts.
2. They are easy to answer.
3. They are quick to answer.
4. They keep control of the conversation with the questioner

Open questions are likely to receive a long answer. They are the opposite of closed questions

Characteristics of open questions are,

1. They ask the respondent to think and reflect.
2. They will give you opinions and feelings.
3. They hand control of the conversation to the respondent.



Wow....look outside, how beautiful it is!

How many butterflies are there in the garden?

What is the color of that flower?



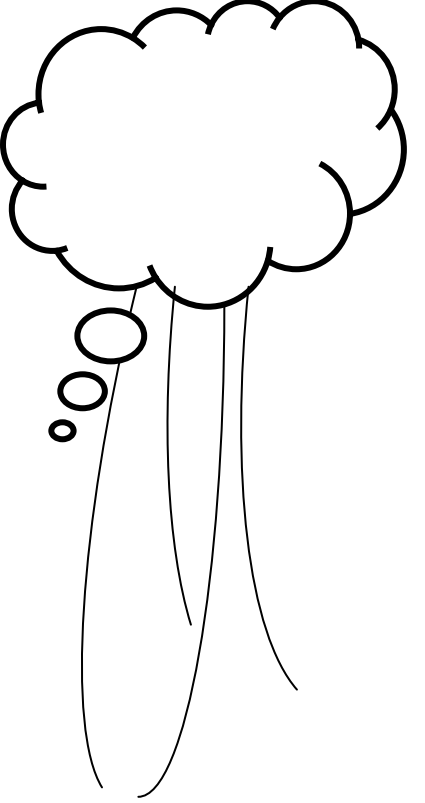
How these flowers and butterflies appear in the color that we see?



CONVERGENT AND DIVERGENT QUESTIONS



Children....Today we are sitting in this beautiful natural classroom.



Convergent thinking is linear thinking. It is learning about facts, Follow instructions and solving problems with one answer, they are actually closed questions.

Divergent questions are open ended questions itself. They have indirect answers .They are generally used to try and encourage a number of answers and lead to critical thinking, creativity and problem solving



Name the process by which plants prepare food.

Oh.....it is a convergent question

How the presence of plants help in getting abundance rain



It is a divergent question because this question demands our thinking



LOWER ORDER AND HIGHER ORDER QUESTIONS

Some questions require deep thinking while others can be answered from our memory.

Mam..... the different types of questions are based on our thinking level, aren't they?



You are right children.
Questions can be lower order or higher order

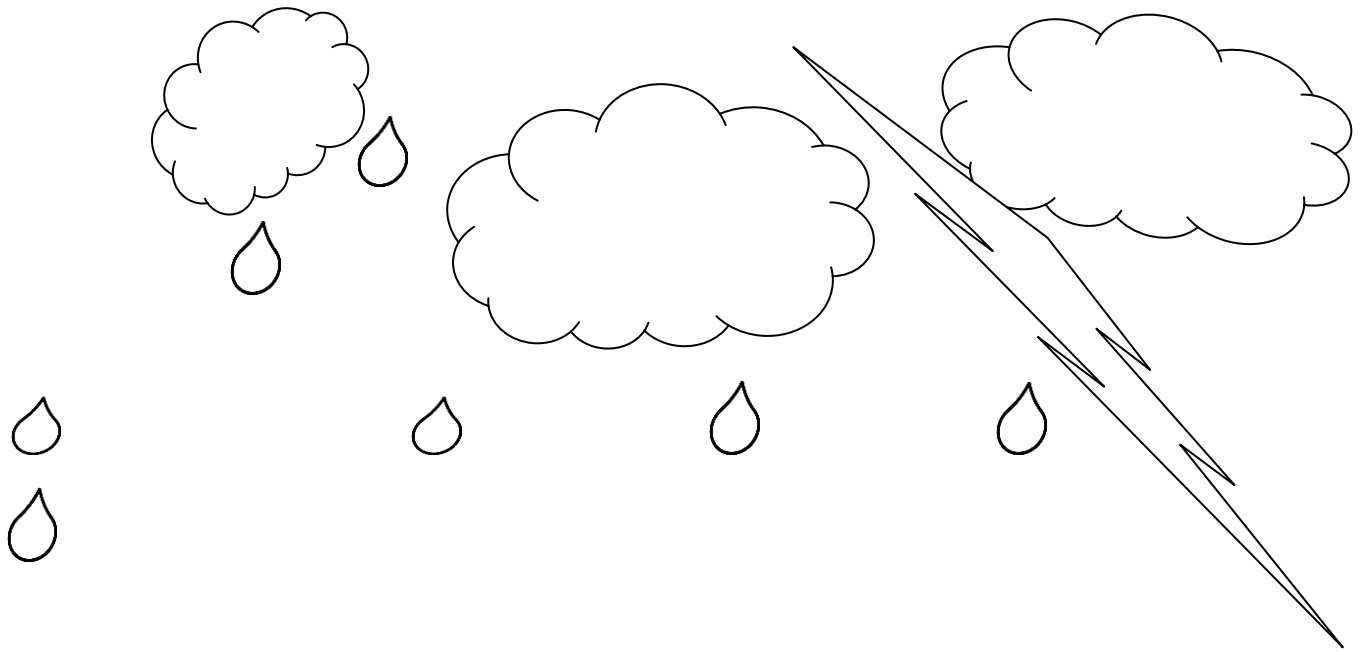
Lower order questions are usually what questions. They typically test our knowledge.

Yes...higher order questions tend to be why and how questions. These questions encourage students to think more deeply about a concept

Lower order questions just check our memory.



Ok.....children get into your classroom, it will rain soon



What causes lightening?



**How this energy
production can be made
useful to common people?**



TYPES OF QUESTIONS IN ENGLISH

In English language questions
are classified into different types

Do you know which
the classifications
are?



Yes /No questions, Wh questions
Tag questions

Choice questions

Hypothetical questions



Embedded questions, Leading
questions



Oh.....very good. Now we
have to see each type in detail. Also
you have to give examples for each
types .ok children.

Ok.....Mam



Yes /No questions and wh questions are two basic types of questions in English.

First we can deal with Yes/No questions.



When forming a yes /no question, it must include one of these verbs: BE, DO, HAVE or a modal verb. As said earlier Yes /No questions are closed questions.



Am I.....

Was it.....

Have you.....

Can you.....

Do you.....

May I..... etc.

are some of the ways in which Yes/No questions starts.



Mam...could you please explain the characteristics of Wh questions



Do we use English question words starting with “Wh” here?



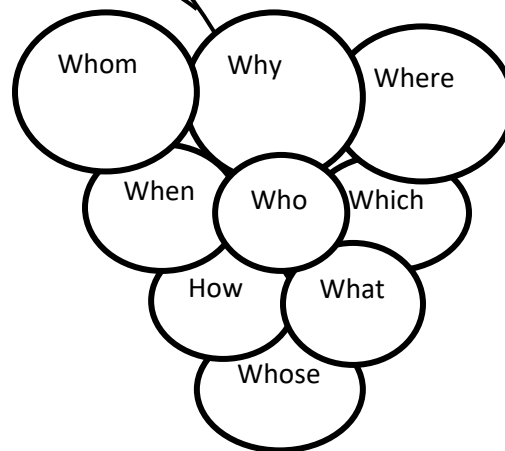
Yes. It also includes ‘how’.

Wh questions are also called open questions because the number of possible responses is limitless.

They must be answered with more information than just a simple “yes” or “no”.

The ‘wh’ question words are,

Wh question words



Also, childrenyou should know about some more types of questions used in English language

Tag questions is a statement followed by a mini –question. We use tag questions to ask information. They mean something like:”Is that right?” or “Do you agree?” etc.

Choice questions are form of assessments in which respondents are asked to select the best possible answer out of the choices.

“Would you like to have an ice cream or a cake” is a such question



Oh.....Very good, students



Mam..then what are hypothetical questions?



Hypothetical types of questions are based on assumptions rather than facts, directed to an expert witness intended to elicit an opinion.

Children, Give me an example for hypothetical question.

This is an example for hypothetical question



What would you do if you get a chance to travel through space?

EMBEDDED QUESTIONS

We use them in reported speech or in polite questions.

These types of questions are less important in science, isn't it Mam?

And **Leading question** is a question which subtly prompts the respondent to answer in a particular way.

Yes children, you are right. These types of questions are less applicable in the context of science. They are mainly used in language.

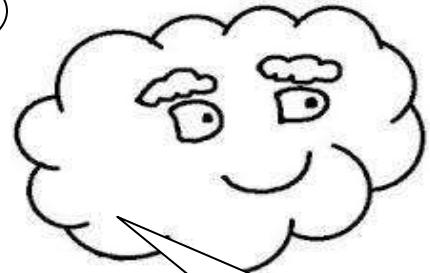
Oh.....The bell rang .ok children see you tomorrow .While going home try to ask the types of questions that we have learned today.

Ok Mam.....Bye.





Friends, it is a yes or no question.



The other girl asked a Wh question.

Wow.....Look at the sky!



Are the clouds floating?

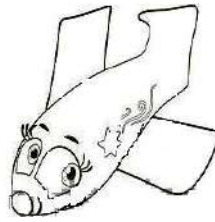
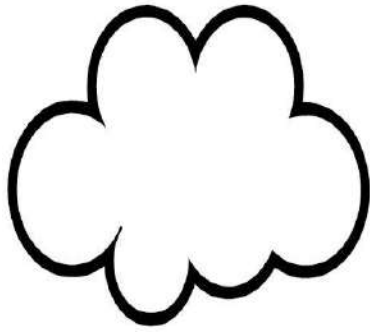


How clouds are formed?

What are the clouds made of?



Look how beautiful they are.
Pure white Clouds.



But, why are the rain clouds so dark?

Look at the sky.....an aero plane!

Yes I know, Wright brothers. When did they invent it?

Oh.....it is at a long distance. It is seen as a spot only.

Do you know, who invented aero plane?

Which instrument helps to see distant object more closer?

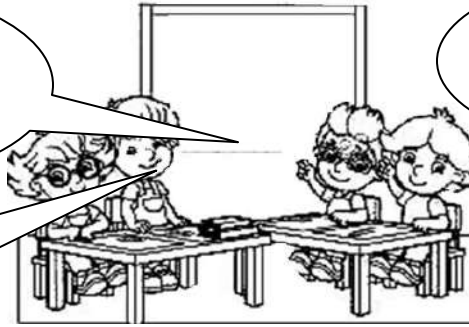


BLOOMS TAXONOMY

Good morning miss

Good morning students....How was your day?

Really good, Mam.
We asked a lot of questions



Now we are going to see the most important classification of questions, The Bloom's Taxonomy.

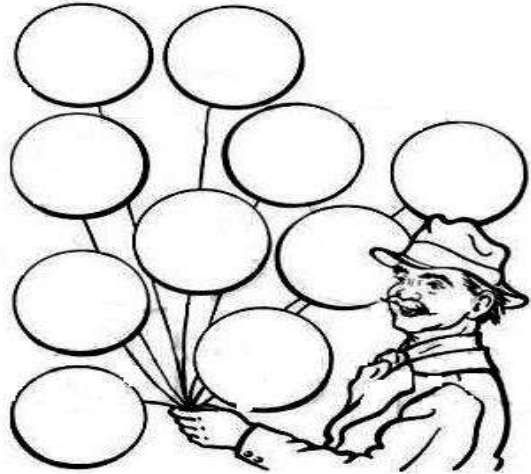


According to blooms taxonomy the questions are classified into 6 types, they are.....

TYPES OF QUESTIONS BASED ON BLOOMS TAXONOMY

1. Knowledge questions
2. Comprehensive questions
3. Application questions
4. Analysis questions
5. Synthesis questions
6. Evaluation questions

Mam look a balloon seller.



KNOWLEDGE
(Remembering)
Test the ability to
memorize and to
recall terms, facts
and details
without necessarily
understanding the
concept

COMPREHENSION
(Understanding)
Test students ability
to summarize and
describe In their
own Words without
necessarily relating
it to anything



Key words for knowledge questions:

Name	Define	Identify
Recall	State	Locate
List	write	memorize
Etc.....		

Key words for comprehension question:

Describe	interpret	Distinguish
Predict	Explain	recognize
Outline	summarize	Discuss
Etc.....		

**APPLICATION
(Transferring)**
Encourage students
to apply or transfer
learning to their own
life or to a context
different than one in
which it was
learned

**ANALYSIS
(Relating)**
Encourage students to
break material into parts
describe patterns and
relationship among parts,
to sub divide Information
and to show how it
is put together

Key words for application questions

Construct	Apply	Compare
Classify	Examine	Illustrate
Solve	Show	Relate
Etc.....		



Key words for analysis questions

Analyze	Differentiate	Examine
Distinguish	Compare	Contrast
Infer	Investigate	Relate
Categorize	Research	Identify
Separate		
Etc.....		

Key words for synthesis question

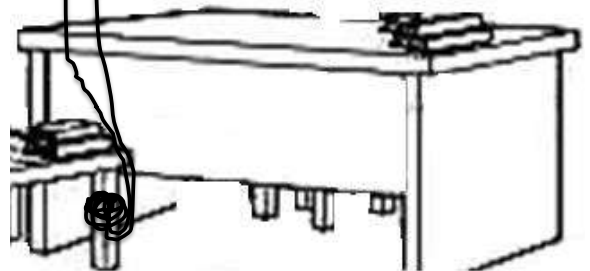
Compose	Combine	Arrange
Predict	Create	Invent
Design	Construct	Develop
Plan	Formulate	Imagine
Integrate	Devise	Propose
Organize Etc.....		

**SYNTHESIS
(Creating)**

Encourage students to create something new
Using combinations of ideas from different sources To form a new whole

**EVALUATION
(Judging)**

Encourage students To develop opinions
And make value decisions about issues based on specific criteria

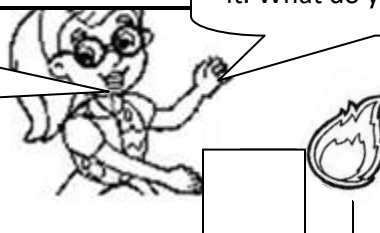


Key words for evaluation questions

Access	Critique	Select
Choose	Verify	Judge
Justify	Argue	Measure
Decide	Prioritize	Recommend
Discuss		
Etc.....		

Look at this paper. I have burnt it. What do you see?

Ok students, today we will learn a small science.





We see fire. Friends, it is a knowledge question through which we recall the term fire

Very good students....Then what is fire?



Friends, this is a comprehensive question. Fire is a form of energy, in my own words.

Wow...Brilliant. How fire has become important in our daily life?

We need fire for cooking. In cold countries, people depend mainly on fire for heat.



We applied the concept of fire to our daily life. So this is an application question.



Are all materials flammable?

No, there are flammable and inflammable materials. Categorize the materials into



This categorization is an analysis question.



Students, you said, fire is a form of energy. Energy is important for the existence of human life. Isn't it?

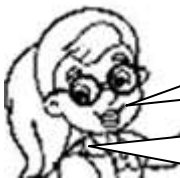


But today, one of the major problems that our country faces is energy crisis. What all things you can suggest to conserve our energy sources?

This question actually promotes our creative thinking. It is a synthesis question.



Think of our conventional methods of energy. For cooking we had used woods. For light, kerosene lamps, candle etc. There was a time people mainly depended on manpower for their works.



Can we bring back such practices in today's life?

This is evaluative question. We are thinking about the merits and demerits of implementing the conventional methods in today's world.

ERICKSON CLASSIFICATION



Children, the next type of classification we are going to learn is Erickson's classification

Who is Erickson ma'am?



Lynn Erickson was a Principal and has written a number of books on different educational topics. She divides the questions into: Factual, conceptual and provocative

Factual questions are the ones that are easily answered with definitive and comparatively simple answers



What are factual questions ma'am?



So, they are the ones used commonly in our tests. Am I right ma'am?

Define reflection of light

What are Newton's laws of motion?



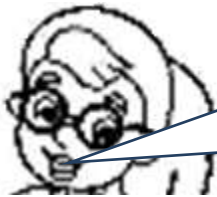
Yes, exactly. Can anyone give me examples for these types?

Conceptual questions

Yes, you are right children.
Now Raju, which is the next
type of question in
Erickson's classification?



What are
Conceptual
questions ma'am?



Conceptual questions might
be ones that are convergent,
divergent or evaluative in
construction- ones that delve
deeper and require more
sophisticated levels of

Ma'am, can you
explain with an
example?



'How does a generator
work?' is an example

That means, deeper
thinking is required
here, isn't it mam?



Now let's move to the next type. Provocative questions



They are the ones that entice, and ones that cannot be answered easily. They are questions that can be used to motivate and frame content or ones that could be classified as essential questions.

How can these type of questions provoke us ma'am?



Oh, that means it allows us to think more deeply



'Why do you think metals are good conductors of heat?'

'Why do the stars appear to twinkle from the sky?'



FACTUAL QUESTIONS, EVALUATIVE QUESTIONS AND INTERPRETIVE QUESTIONS



For the **factual questions** the answer is not always simple, however; it depends on how broad the question is. Factual questions usually make the best inquiry-based projects, as long as they are answerable and have room for exploration.

Evaluative questions ask for some kind of opinion, belief or point of view, so they have no wrong answers. Nonetheless, the answers do depend on prior knowledge and experience.



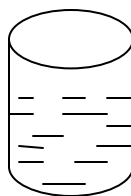
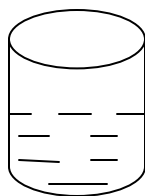
Mam then what are interpretive questions?

Interpretive questions have more than one answer, but they still must be supported with evidence.





Ok students, look at these two beakers. Here one beaker contains acid and other contains base



What we observe while we dip a litmus paper into the first beaker? Do you know why this happens?

This is an example of factual questions

We always add water to acid for its dilution. What will happen if we add acid to water?

This question requires our earlier knowledge, which is an explanatory question.

How can you explain the change in colour of the litmus paper?

Questions are used to get information



Students, can you say the purpose of questions?

Very good. You're right



The principal use of questions is to elicit information from the person being addressed. Any other opinion?

Questions may be asked for the purpose of testing someone's knowledge also.



Ok....While we ask a question, it serves a purpose. Some questions test our knowledge; some questions make us to think more; some questions demands our prediction.





While interacting with a subject or nature, we primarily ask factual questions

They test our knowledge



They are the best way of enquiry, this gives the room for exploration



These questions stand only at a peripheral level, pointing to recalling our memory



But mam...as science students what should we do to get a deep view on what we learn

For this you have to ask explanations for everything you sense

Explanatory questions help to understand the reality of a situation and explain it



Mam, is questioning important in new inventions and discoveries.

Always, new discoveries and inventions are built up in the platform of a question

Science always questions the existing ideas through justifying questions

Justifying questions are used to challenge old ideas and develop new ones.



Even when the scientists implement a new idea, their work does not end there. Always they search for a better way. Leading questions promote their work.



Leading questions are used to advance a suggestion of your own or those of others. They also prompt a conclusion and move a discussion toward closure.

There are also hypothetical questions which introduce other suggestions or change the course of discussion





Friends there are
comparison questions also

Comparison questions compare two or more
objects or events



While comparing one another
more clarifications will be
obtained



Students while you return and play at home,
you should try to ask questions in all situations
that you come across.

Anu, what are you doing there?

I am playing mamma.....

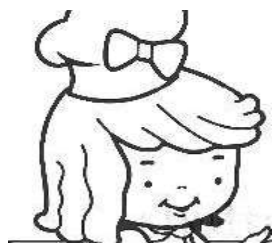
Oh.....what happened, my spoon
is broken!

Which property of light
is responsible for this
observation?

Oh.....it appears to
be bend only when
it's inside the water



Why does the spoon appear to
be bend inside the water?



THE TYPES OF QUESTIONS THAT ENCOURAGE STUDENTS PARTICIPATION IN CLASS

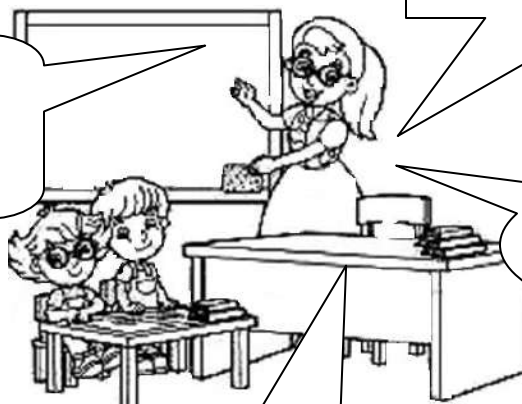


SOCRATIC CLASSIFICATION OF QUESTIONS



Children do you know who is Socrates?

Yes mam, he is one of the greatest educators who taught by asking questions and thus drawing out answers from his pupils



In that leaflets the Socratic classification of questions are written

There are six types of questions in this classification

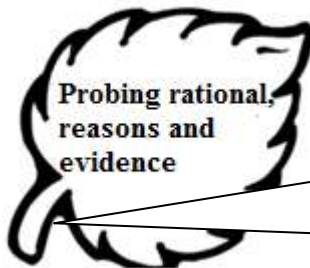
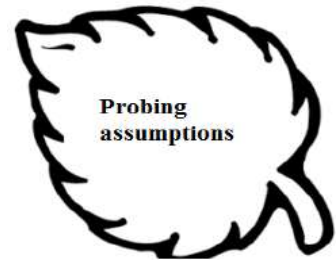
Children here you have to do an activity

You have to read it

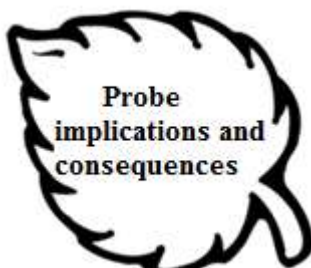


Conceptual question make one think more about what exactly they are asking or thinking about it. Prove the concepts behind their argument

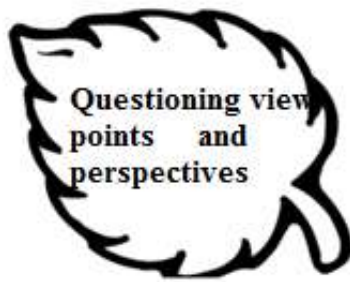
Probing assumptions, makes them think about the presuppositions and unquestioned beliefs on which they found their argument



Probing rational, reasons and evidence when they give a rationale for their arguments, dig into that reasoning.



In probe implications and consequences, types of questions, the argument that they give may have logical implications that can be forecast



While questioning our view points and perspectives, here Most arguments are given from a particular position. So attack the position. Show that there are other, equally valid, viewpoints.

Question about the questions are used to get reflexive about the whole thing ,



Questions about the questions



Oh.....it's really good children.





Students.....you have seen the different types of questions



Basically in science, we always ask what questions and limit our enquiry thirst

But we should ask how and why question to each and every minute things to explore the mysterious science



Mam, are there many things in nature, for such exploration

Yes of course, the nature itself is made up mystery



Ok students ,Tomorrow
we are going for tour to
enjoy the beauty of nature

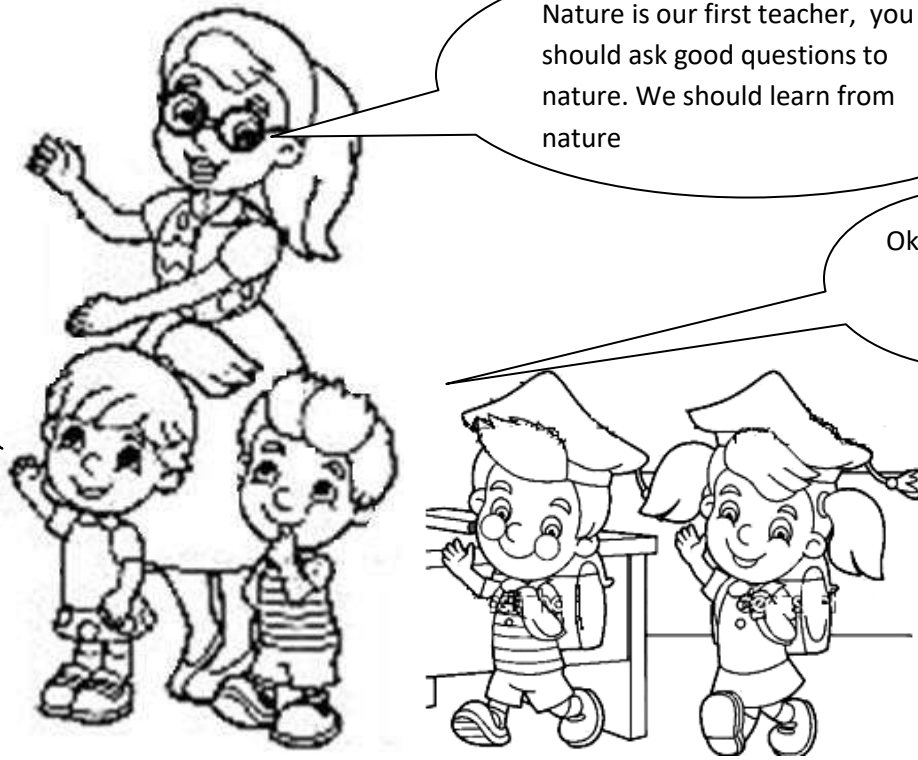
Nature is our first teacher, you
should ask good questions to
nature. We should learn from
nature

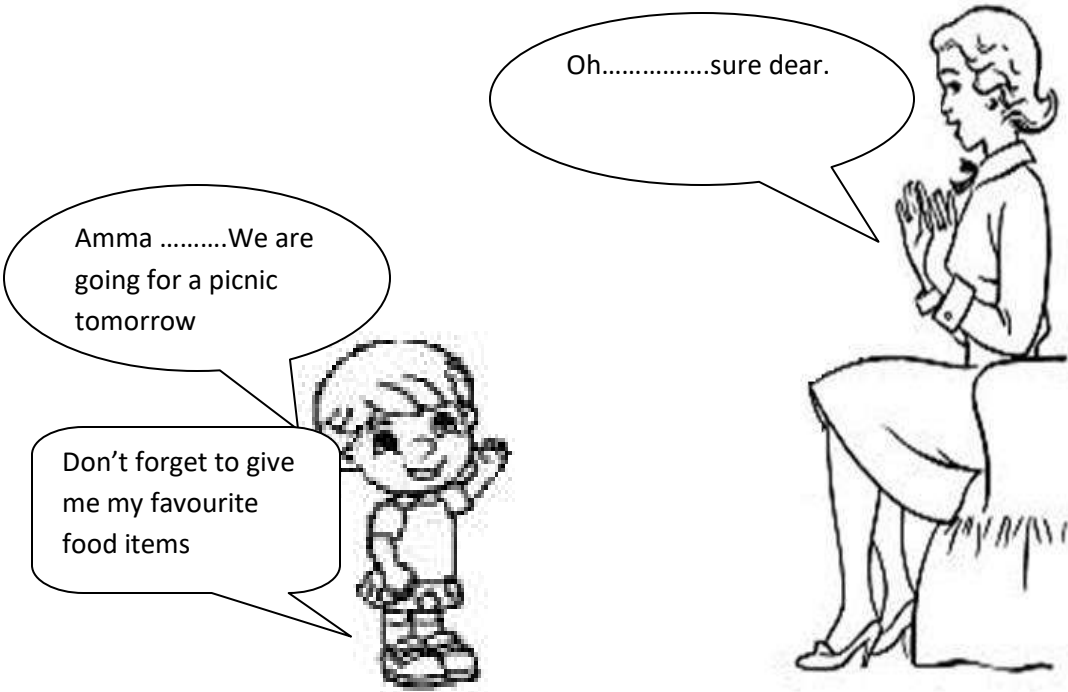
Ok.....mam

Wow..going
for tour.

Students you should come a little earlier
tomorrow.

Ok
mam.....





AmmaWe are
going for a picnic
tomorrow

Don't forget to give
me my favourite
food items

Oh.....sure dear.



Get
up.....
.....it is getting late.

Oh.Amma ,Getting late. I will
miss my bus today



Don't worry my child, I am preparing your
food in pressure cooker. It will get ready
soon.

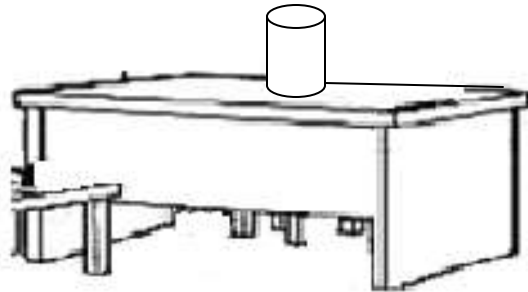
Pressure cooker

Why food is cooked faster in a
pressure cooker?

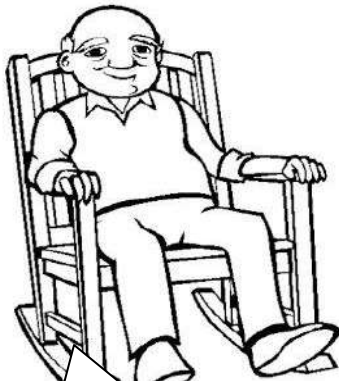


Dear.....come and have your milk. It is kept there in a glass.

Do you know who invented glass?



Child, your bus arrived



Grandpa....mamma.....bye
bye.

Bye dear.....Oh.....It is going to rain soon. Look outside child, you may see a rainbow on sky today .

Wow.....a rainbow. When does a rainbow appear on the sky?

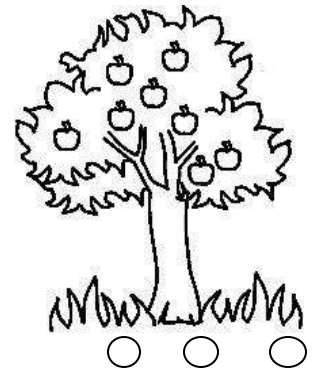




Going for tour.....

Bye mamma.....

Ohh.....what happened to my
fruits.



Do you know that these apples fell
down because of gravitational force?



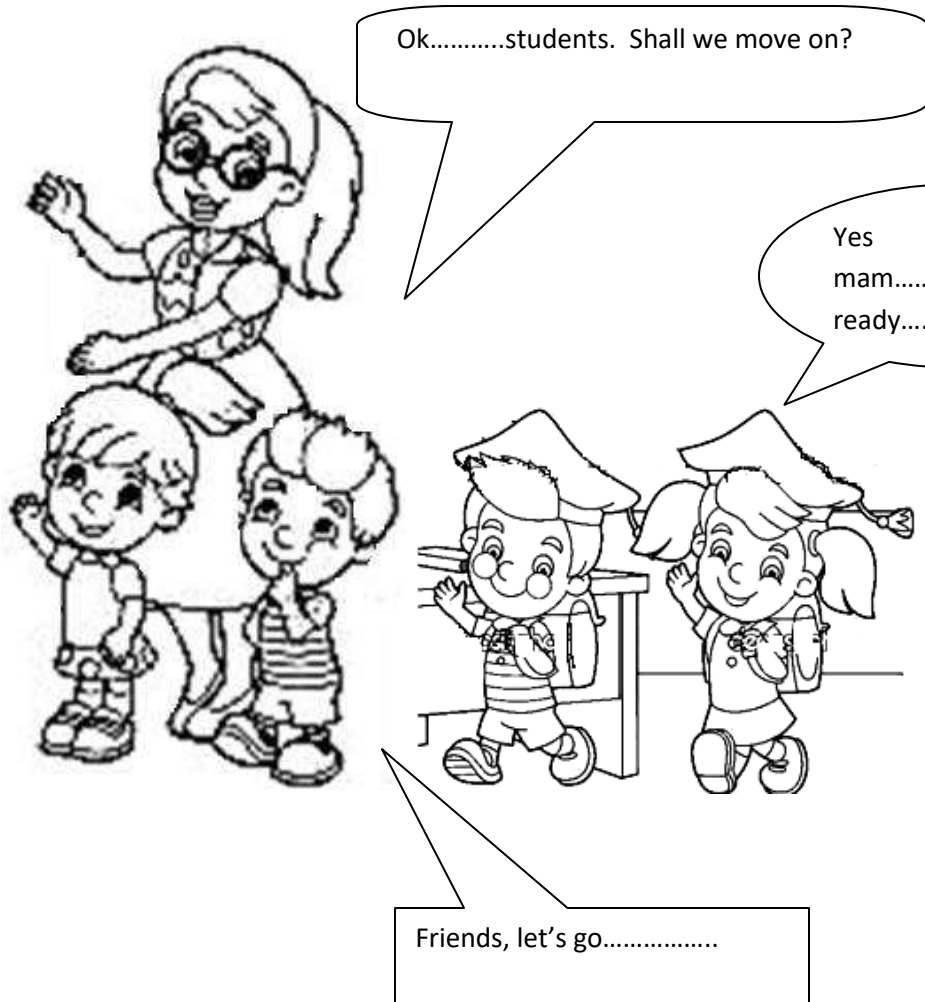
Ohh....yes, but who
discovered the gravitational
force?

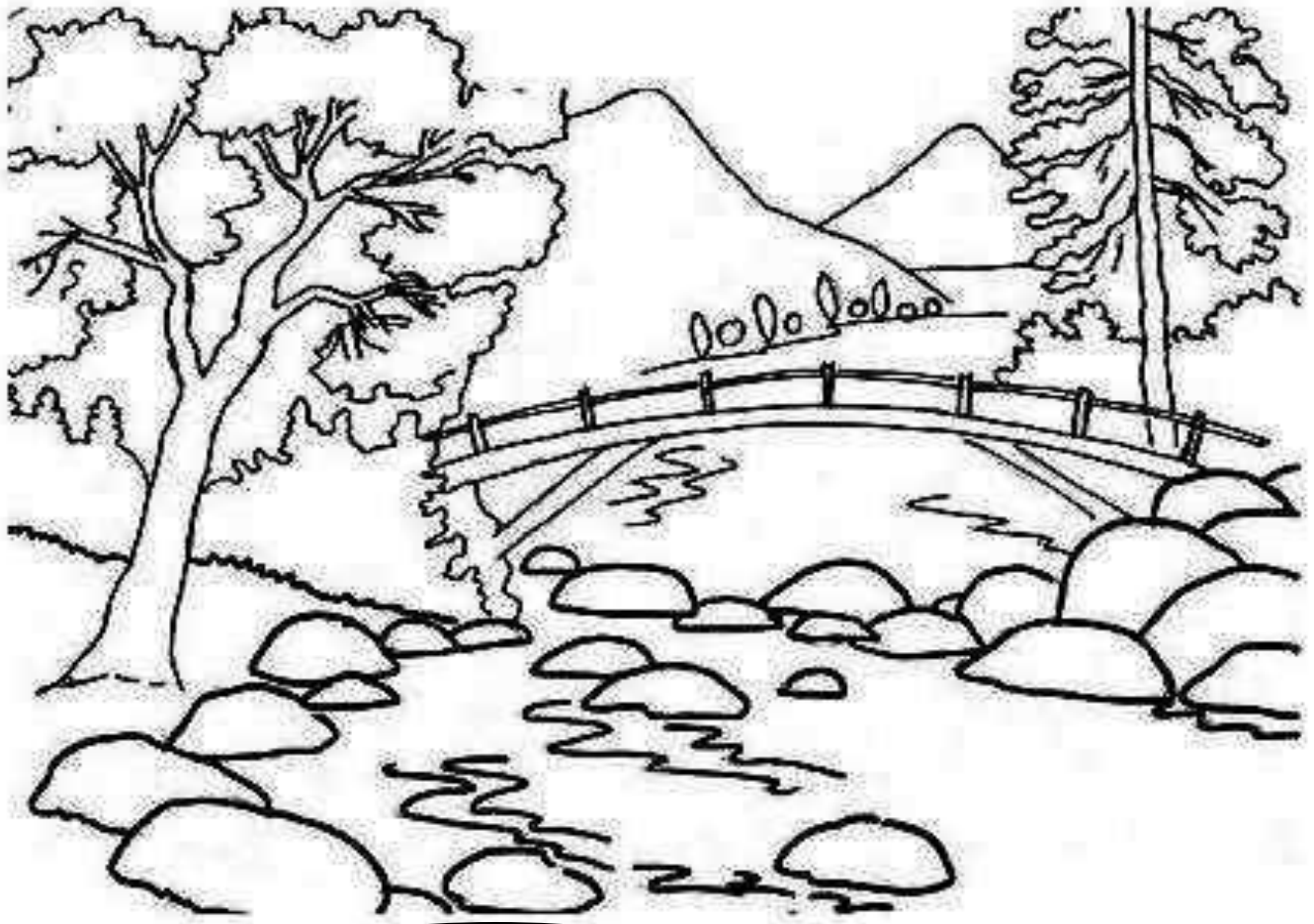


Do you know which planet has the strongest
gravitational pull?

Friends, where do we feel
the earth's gravitational
pull the strongest?







Do you know how are the rivers
and streams are formed?



Why do these rivers
flow from top to bottom
always?



Oh.....Kitty what are you doing there?

Ah.....another kitty in water! How do we see our image in water? Is there a mirror inside the pond?



Who is this????



Kitty come let's play, come on everyone let's play.

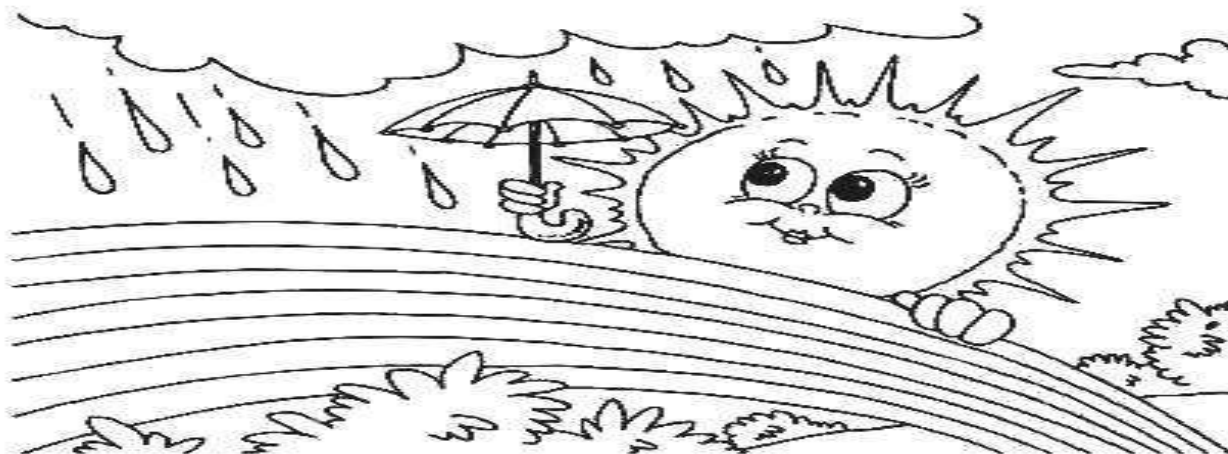
Kitty, hit the ball, let's play



Why do objects need an external force to start their motion?

What are the different types of motion?





Wow.....friends, look at the sky. How rainbow appears on the sky?



How many colors are there in a rainbow?



Have you seen a rainbow before?

Yes, I have seen.

Why there are seven colors in a rainbow?



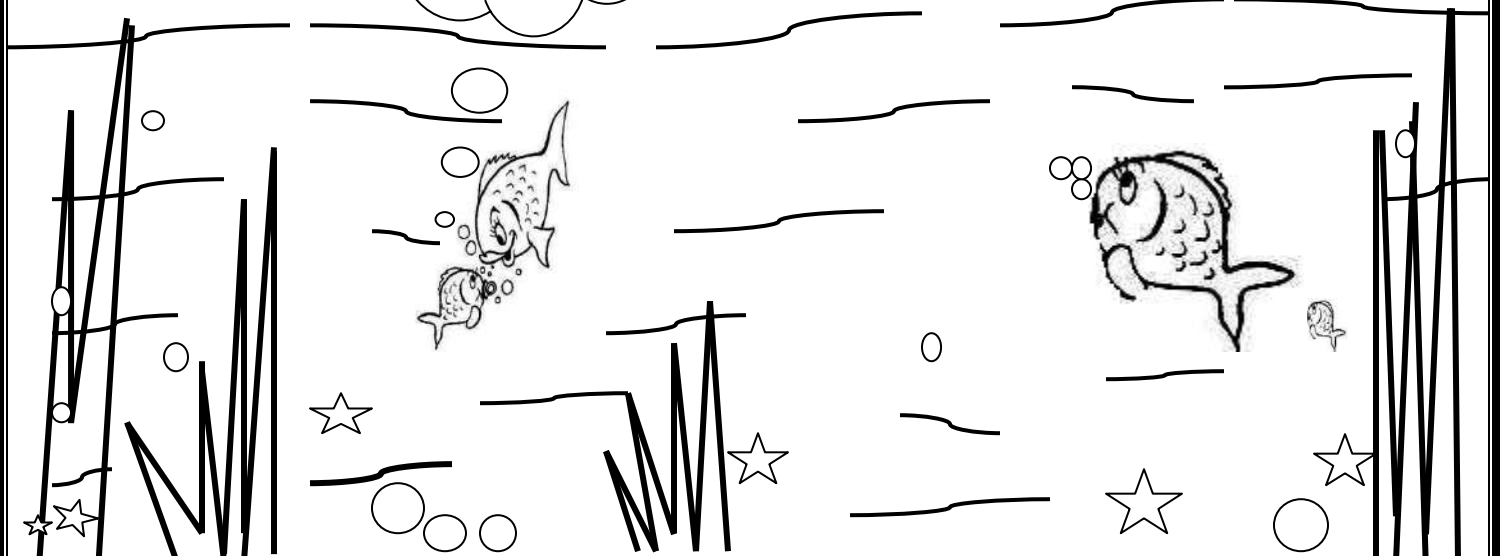


What will happen to the sea level in future ,if global warming continues to increase at the present rate?

Friends have you been to sea shore before?

Hi
friends.....
.....

Children are you familiar
with the term global
warming





Ok. Students, come back .Lets go from the sea shore.

How many of you want ice-creams?

Ice-cream! Is it a solid or a liquid?

Why does ice-cream melt so fast?



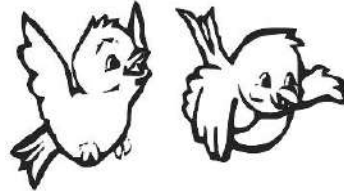
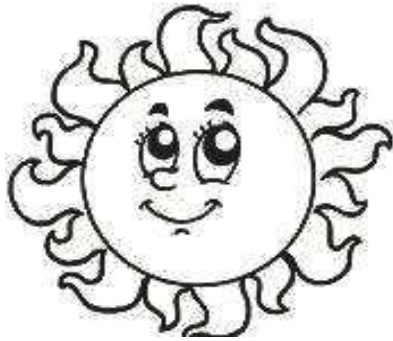
Ok children come back, let's go to the other place

Now, where shall we go mam?

We are going to see the sunset.



I think students are aware of the ozone layer depletion due to high pollution on the Earth



Ya, I heard about it, one of the great threat that our earth faces today



What are the consequences of ozone layer depletion?

Ok students, it is time to come back



Wow..... look at the sky

How would my life change if I had two wings?





Students, what did we learn till now

We learnt ask good questions

We came to know more about the nature

We have learnt different types of questions

It was really interesting





How to ask good questions?

DEPARTMENT OF PHYSICAL SCIENCE

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