Activity1: Asking Questions

Raju and Ravi went up the hill. Ravi asked Raju to give him his binoculars, so that he could have a look at the cricket stadium nearby. Raju was more interested in eating the delicious fruits which grew on the trees on the hill, so he was happy to give away the binoculars. They both climbed a tree for different reasons- Raju was interested in the fruits while Ravi wanted to watch the cricket match.

Q1 Can you ask a What/Where/Who question? Can you directly find it's answer from the paragraph?

Q2 Can you ask a Why question? Can you directly find it's answer from the paragraph?

Q3 Can you ask a Why question whose answer is directly mentioned in the paragraph?

Q4 Can you ask a Why question whose answer is not directly mentioned in the paragraph?

Q5 Can you ask a How question? Can you directly find it's answer from the paragraph?

Q6 Can you ask a How question whose answer is directly mentioned in the paragraph?

Q7 Can you ask a How question whose answer is not directly mentioned in the paragraph?

Q8 How do 'What/Who/Where'-questions make you think? Do you try to remember facts or do you try to think?

Q9 How do 'Why/How'-questions make you think?

Q10 Are factual questions more important or cognitive (higher order thinking) questions more important?

Question- Bucket (Ideally you should not use the question bucket. But then, you can start off with the questions here in case you can't think of questions. We'd advice you to write one extra question incase you are using the questions of the question bucket)

1- Why did Raju want to climb up the hill?

2- Where did the crack blast?

3- How did Ravi watch the cricket match?

4- Why did Ravi ask for the binoculars?

5- How did Raju maintain physical fitness?

Question-Tree

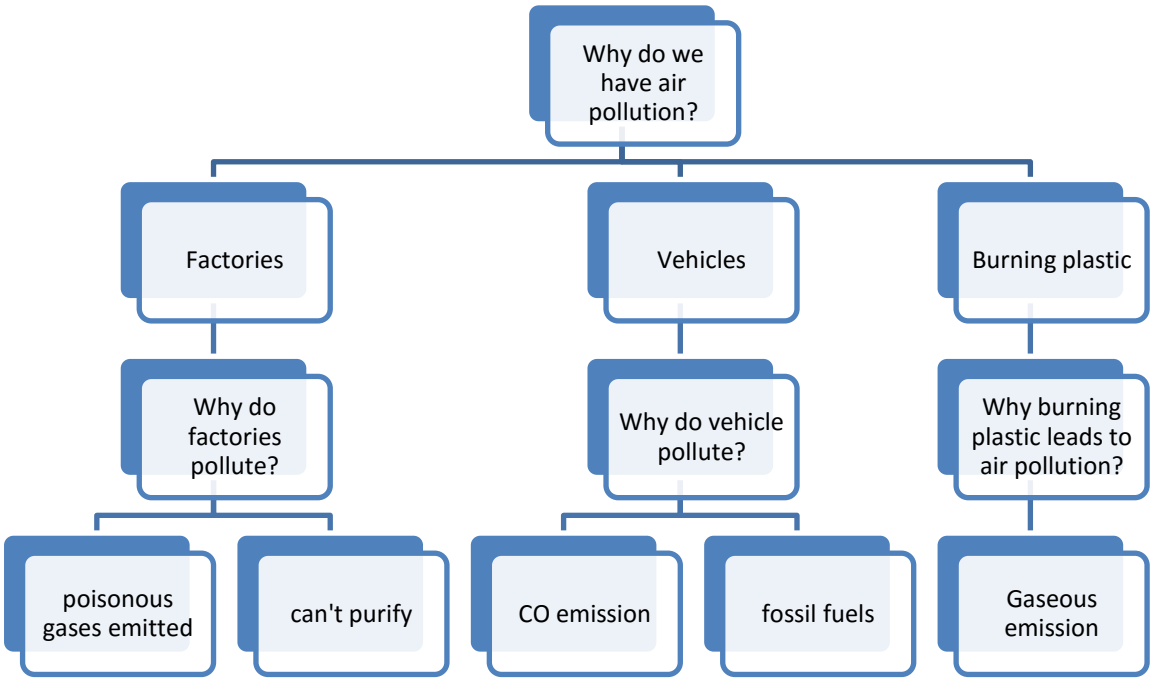
Running short of questions? Can we think of a method which improve our ability to ask questions? Can we try and get more questions from a few questions?

Toyota-5 Whys Technique
- Ask a Why question atleast five times, don't be satisfied with an answer

For instance, consider the question- "Why did the dog bark?".
Answer: The dog saw a stranger.
Question: Why does the dog bark on seeing strangers? [2nd Why]
Answer: He is protective of his house.
Question: Why is he protective of his house? [3rd Why]
Answer: Dogs have evolved to be protective?
Question: Why have dogs evolved to be protective? [4th Why]
Answer: Because they needed to protect their caves to enhance their survival chances
Question: Why did they have to protect their caves to enhance their survival chances? [5th Why]
Answer: A few dogs had to protect themselves against predators while the dogs were resting in the caves

You can actually go on. The answers don't have to right, the sequence of Questions and Answers help you in thinking about the problem/question deeply.

Did you notice that you could have multiple correct answers at each step? So can we build a tree using questions and answers? Look at this example!



Activity-2 Socratic Questioning - I

Pick up any textbook or story-book of your choice.

Socrates was one of the greatest educators who taught by asking questions and thus drawing out answers from his pupils ('ex duco', means to 'lead out', which is the root of 'education'). Sadly, he martyred himself by drinking hemlock rather than compromise his principles. Bold, but not a good survival strategy. But then he lived very frugally and was known for his eccentricity. One of his pupils was Plato, who wrote up much what we know of him.

Here are the six types of questions that Socrates asked his pupils. Probably often to their initial annoyance but more often to their ultimate delight. He was a man of remarkable integrity and his story makes for marvelous reading.

The overall purpose of Socratic questioning, is to challenge accuracy and completeness of thinking in a way that acts to move people towards their ultimate goal.

Clarification Questions:

1- Did you understand the passage?
2- Do you think you understood what the author is trying to convey?
3- Are you missing anything? Are you missing any subtle details?
4- What is the author's thought process? Why is the author saying that?
5- Can I look for example to understand the author's argument?

Examples:

- *Why is the author saying "martyred himself"?*
- *What exactly does "Bold, but not a good survival strategy" mean?*
- *Is the author saying that "Socrates didn't know answers and got them out of his pupils" or is he saying that "Socrates chose to get his answers from his pupils over giving them his answers directly?"*
- *Can you give an example to illustrate how socratic questions could be initially annoying?*
- *What do you mean by “completeness of thinking”*

Probing Assumption Questions

- Do we have any presuppositions or unquestioned beliefs in the passage?
- Are arguments built on assumptions? Can we build arguments without assumptions?
- Can you think of an argument? List down the assumptions in your argument?
- How does the argument get affected if one of the assumptions is disproved?

- Why are probing assumptions questions important?

Examples

- *What are the assumptions in the passage? What else could we assume?*
- *Are we assuming that "Socrates was one of the greatest educators"?*
- *How did you assume that "Socrates was one of the greatest educators"?*
- *Please explain why/how "Socrates would draw out answers from his pupils"?*
- *How can you verify/disprove that "Socrates was one of the greatest educators"?*
- *What would happen if "Socrates didn't ask questions"?*
- *Do you agree or disagree with the assumption that "Socrates was a great educator"?*

Probing Rationale/Reasons/Evidence Questions

- How is reasoning/evidence different from as assumption?
- If the passage says "Socrates was a great man as he asked questions", can probe the reasoning?
- Are all reasons/evidence strong?
- What do we do we the reasoning is weak or incorrect?
- Should we probe reasoning?

Examples

- *Why didn't "Socrates want to compromise on his principles"?*
- *How do you know that Socrates was poisoned as he refused to give up his principles?*
- What evidence do we have to prove that Socrates was poisoned?
- *Can you give me an example of how Socrates drew answers from his pupils?*
- *The author explains that Socratic questions are good, even though they are initially annoying. Are you sure that Socratic questions eventually lead to ultimate delight?*
- *How can the above reason be refuted?*

More Questions (Give examples)

- Where would you use clarification questions?
- What is the difference between assumptions and reasons?
- If you were a judge and if participant A used a bad assumption, while participant B used a bad reason, whom would you penalize more? Why?
- Where would you use probing assumption questions?
- Where would you use probing reasoning/evidence/rationale questions?

Activity-2 Socratic Questioning - II

Questioning Viewpoints/Perspectives Questions

- Is the author looking at the argument from one point of view? Are there more ways to think about the argument?
- Can you think about other ways of looking at the argument? Which is better?
- Did the author miss out on perspectives(the way someone looks at something) of people?
- How would different people look at this argument?
- Did the author miss out on a few details?

Examples

- *Socrates poisoned himself as he was forced to abandon (leave) his principles, do you agree?*
- *Can you think of other reasons which would have forced Socrates to kill himself?*
- *The author's view is that Socrates was eccentric (different from others), do you agree?*
- *What are the strengths and weakness of "drawing out answers from pupils"?*
- *What are the other ways of teaching?*
- *Did Socrates really think of this or did Plato attribute(give credit) it to Socrates?*

Probing Implication/Consequence Questions

- If this argument is true, what should/would happen in the future? Can we test it?
- If we assume that the author is correct, what else should have happened?
- What do you mean by an implication? What do you mean by statement A implies statement B? Why does more traffic imply more pollution?
- The dictionary states that implications follow from thoughts and that consequences follow from actions? Can you think of an example- a statement which is hard to differentiate- whether it is an implication and a consequence?
- What are the various logical relationships between statements? How are the statements "Hyderabad has a lot of vehicular traffic" and "Hyderabad has a lot of pollution" related logically? Why is it important to probe the logical relationship between two statements?

Examples

- *If Socrates didn't poison himself, what would have happened?*
- *What are the consequences of the assumption that "drawing out answers from pupils is a good way to teach? What should happen if this is a good way of teaching?*
- *How could Socrates' story be used to inspire teachers or students?*

- *If Socratic Questions are initially annoying, how does it affect the student?*
- *The author states that Socratic Questioning challenges accuracy, how does it help?*

Question the Question

- Are all questions good? What makes a good question? Can questions be irrelevant?
- Would it be a good idea to understand the purpose of a question?
- If somebody is not able to think through a question properly, can he/she be given more questions so that they understand what they were required to think?
- Can a question be an answer to a question? If somebody asks "why should I drink lots of water", can you answer with a question? Would this question help- "would you lose water through the day?"
- If a question has an implicit assumption, which you don't agree, how would you counter that? For instance, the question "How does drip irrigation help farmers" assumes that drip irrigation helps farmers, how would you counter the assumption, with the help of a question?
- If you have no clue about a question, can more questions help you in answering a question?

Examples:

- *What was the point of asking that question-" What are the strengths and weakness of drawing out answers from pupils"?*
- *What else might I ask to explore the meaning of the word "eccentric"?*
- *What does the question- "What do you mean by an implication? "? Can you ask more questions which will help in understanding this question?*
- *Does this question- "How could Socrates' story be used to inspire teachers or students?" assume anything? Do you agree with the assumption? How can you question the assumption?*
- *Is this a good question- " Did Socrates really think of this or did Plato attribute(give credit) it to Socrates?" ? How does this question help us? Does it make us learn something?*

More Questions(Give examples):

- Where would you use alternate viewpoint/perspective questions?
- Where would you use probing Implications/Consequences questions?
- Why would you question a question?
- If you are participating in a dialogue and if you don't understand the argument, what kind of questions can you ask. If you disagree with the argument, what kind of questions would you ask? If you agree, what kind of questions do you ask?
- Why would you want to think about the contradictions before thinking of perspectives? Or you would you prefer looking at perspectives before looking at contradictions?
- Would you be able to think of contradictions while trying to understand the argument?

Activity5- Bloom's Taxonomy-I

"When Greg Dyke became Director-General of the BBC in 2000 he went to every major location and assembled the staff. They came expecting a long presentation. He simply sat down with them and asked a question, “What is the one thing I should do to make things better for you?” Then he listened. He followed this with another question, “What is the one thing I should do to make things better for our viewers and listeners?” He knew that at that early stage he could learn more from his employees than they could from him. The workers at the BBC had many wonderful ideas that they were keen to share. The fact that the new boss took time to question and then listen earned him enormous respect.

Columbo solves his mysteries by asking many questions; as do all the great detectives – in real life as well as fiction. All the great inventors and scientists asked questions. Isaac Newton asked, “Why does an apple fall from a tree?” and, “Why does the moon not fall into the Earth?” Charles Darwin asked, “Why do the Galapagos islands have so many species not found elsewhere?” Albert Einstein asked, “What would the universe look like if I rode through it on a beam of light?” By asking these kinds of fundamental questions they were able to start the process that lead to their tremendous breakthroughs."- Ask questions: The Single Most Important Habit for Innovative Thinkers, Paul Slone

Knowledge questions - questions which test recall.
Keywords: who, what, why, when, omit, where, which, choose, find, how, define, label, show, spell, list, match, name, relate, tell, recall, select

Q1: Who is the detective mentioned in the passage?

Q2: What is common to great inventors and scientists?

Q3: When did Greg join as the Director-General of BBC?

Q4: Can you list three questions which helped scientists?

Q5: Where are unique species found?

Activity

Q1 What did you learn by solving the (five) above mentioned questions?

Q2 Using the chosen text, design any 5-Knowledge-questions based on the above mentioned keywords?

Q3 What do students learn by solving the five questions designed by you?

Q4 Can you explain the summary of the passage?

Q5 Why do you need 'recall'? How do knowledge questions help?

Comprehension Questions: Understand the meaning, restate or explain in own words

Keywords: Translate, interpret, extrapolate, but not see full implications or transfer to other situations, closer to literal translation

Q1. What Einstein mean by riding on a beam of light? [Hints- Why did he want to ride on a beam of light and not a horse or a camel?]

Q2. Does the passage state that Galapagos has so many species and that very places in the world have such a large number of species?

Q3. Fundamental means basic or core or primary, as stated by the dictionary. Why did the author call these questions- fundamental questions?

Q4. Can questions earn you respect, how?

Q5. Do the detectives, mentioned in famous novels, ask a lot of questions? How do you know?

Activity

Q1. What did you learn by solving the above mentioned questions? How were these questions different from Knowledge questions?

Q2. How do these questions help you in understanding the passage? Why were you made to re-express the contents of the passage in your own words?

Q3. If you do not understand a passage, can you try and ask comprehension questions? How would they help you in understanding? [If you understand the passage, you are happy, if you don't understand, you are still happy- you'd get some nice questions to ask your friends!]

Q4. Can you design 5- comprehension questions around the chosen text?

Q5. What would students learn by solving the questions designed by you?

Activity6- Bloom's Taxonomy-II

Regarded as one of the most creative thinkers of the 20th century, Feynman was known for his unique (often eccentric) way of viewing the world and scientific problems. Despite his apparent brilliance and wealth of knowledge, Feynman's most lasting contributions to science came from his boundless creativity. Marvin Minsky, a friend and colleague from MIT, once noted of Feynman that he was "unusually good at going back to being like a child, ignoring what everyone else thinks…He was so unstuck – if something didn't work he'd look at it another way."

The brilliance of Feynman's work came not only from his incredible grasp of scientific concepts and theories, but from his need to understand how everything fits together. He didn't take any piece of knowledge for granted and strived to understand how every principle or conclusion fit into the broader framework of scientific knowledge. He claimed to have "learned very early the difference between knowing the name of something and knowing something." He believed very strongly in the importance of understanding, in addition to knowing. Feynman once described algebra as "a series of steps by which you could get the answer if you didn't understand what you were trying to do." - Ryan, on boneducation.com

Application Questions: apply the facts, use the knowledge in real situations
Keywords: use, apply, discover, manage, execute, solve, produce, implement, construct, change, prepare, conduct, perform, react, respond, role-play

Q1. The author asks students to try and understand concepts. But don't students do that already? Can a student succeed in solving problem even though he doesn't understand the concepts?

Q2. You asked your friend-"why does the apple fall down" and she answered "gravity". And then you ask a series of question about gravity- "what is gravity", "how do you know you have a force of attraction", "why don't you fall down then?" and so on. Why is it important to ask these questions? [Is it related to the "difference" mentioned in the passage?]

Q3. Say you are trying to solve a problem and you do not get any ideas despite making frantic efforts. Do you think a child-like approach would help in such a case? How? [How did Feynman use it?]

Q4. Assume you were Feynman and you attended two classes today. You learnt how the human brain works in the first class and you learnt English language grammar in the second class, what would you try and do? Would you want to try and see how they 'fit together'?

Q5. Can you state a fact which you took for granted? Why did you not question it? How would you find out if it is actually true?

Activity

Q1. Would application questions help you in assessing if you understood something? Why would you want to apply knowledge in real world scenarios?

Q2. Why is Comprehension required, before application? Why did we learn Comprehension questions before getting to Application questions?

Q3. Can you design five application questions around your chosen text?

Q4. What does a student learn by answering the five questions designed by you?

Q5. How do application questions help?

Analysis Questions: breaking down arguments into parts

Keywords: analyze, break down, catalogue, compare, quantify, measure, test, examine, experiment, relate, graph, diagram, plot, extrapolate, value, divide

Q1. Why does the author use the phrase "Despite his apparent brilliance and wealth of knowledge"? The word 'despite' is usually used to produce contrast, what is the author trying to contrast Feynman's brilliance against? Why does he want to produce this contrast?

Q2. Can you compare Feynman with a child? What are the similarities and differences?

Q3. Does Feynman imply that it is not important to know names of things?

Q4. Does Feynman believe that you can solve Algebra problems without understanding the steps?

Q5. Do you think Feynman was 'eccentric' (unconventional and slightly strange)? Should everyone be 'eccentric'?

Activity

Q1. Why would you want to break an argument into parts? What is the advantage gained by probing a smaller part of the entire argument?

Q2. How can you break an argument into parts? How does an analysis question help if you do not understand the meaning of a sentence?

Q3. Can you think of a case where you understood the literary meaning of a sentence, but you did not understand the intension behind the author stating the sentence? [For instance- author said Feynman was like a child. You may have understood the meaning of the sentence, but were probably still curious as to why the author compared Feynman with a child]

Q4. Can you design 5 analysis questions around your chosen text?

Q5. What do students learn by solving the five questions designed by you?

Activity7- Bloom's Taxonomy-III

"We run the company by questions, not by answers. So in the strategy process we've so far formulated 30 questions that we have to answer. I'll give you an example: we have a lot of cash. What should we do with the cash? Another example of a question that we are debating right now is: we have this amazing product called Ad-Sense for content, where we're monetizing the Web. If you're a publisher we run our ads against your content. It's phenomenal. How do we make that product produce better content, not just lots of content? An interesting question. How we do make sure that in the area of video, that high-quality video is also monetized? What are the next big breakthroughs in search? And the competitive questions: What do we do about the various products Microsoft is allegedly offering? You ask it as a question, rather than a pithy answer, and that stimulates conversation. Out of the conversation comes innovation. Innovation is not something that I just wake up one day and say 'I want to innovate.' I think you get a better innovative culture if you ask it as a question."- Sergey Brin, Co-Founder, Google, in an interview with the TIME Magazine, in the year 2008.

Evaluation Questions: judgments about information

Keywords: award, choose, conclude, criticize, decide, defend, determine, dispute, evaluate, judge, justify, measure, compare, mark, rate, recommend, rule on, select, agree, interpret, explain, appraise, prioritize, opinion, ,support, importance, criteria, prove, perceive, value, estimate, influence, deduct

Q1. If you were Sergey Brin, would you prefer lots of content or better content? Why?

Q2. Can you questions confuse employees? Would you prefer having employees ask a lot of questions or would you want them to ask limited questions?

Q3. If you were the CEO of a Fortune 500 Company, would you choose to focus on your company or would you also want to consider competitive questions?

Q4. If you have a lot of cash, would you prefer asking a Financial Consultant what to do or would you want to ask questions and encourage a dialogue between your team?

Q5. How does innovation emerge out of conversation? Would an innovator be able to produce innovation alone or would be do better by collaborating in a conversation with his colleagues?

Activity

Q1. Observe question5, we have an analysis question followed by an evaluation question. Why do you think evaluation questions have analysis questions as prerequisites (a thing that is required as a prior condition for something else to happen or exist)?

Q2. Does an evaluation question requires an understanding of the process to answer all the other types of questions (discussed so far)- Knowledge, Comprehension, Application and Analysis?

Q3.What do we learn by asking evaluation questions? Why do we need judgment? When did last make a choice? What did you choose and why did you choose that option?

Q4. Can you design 5-evaluation questions around the text chosen by you?

Q5. What do the students learn by answering the questions designed by you?

Synthesis Questions: combining information in a new pattern, finding newer solutions, creating something

Keywords: build, choose, combine, compile, compose, construct, create, design, develop, estimate, formulate, imagine, invent, make up, originate, plan, predict, propose, solve, solution, suppose, discuss, modify, change, original, improve, adapt, minimize, maximize, delete, theorize, elaborate, test, improve, happen, change

Q1. Can you design a strategy with the help of which Sergey Brin can get his employees to ask him a lot of questions?

Q2. If innovation comes out of conversation, how can you develop an organization culture which encourages employees to talk to each other?

Q3. Sergey Brin asked- "how do I monetize high quality video?". Would there be any difference between advertising revenue from high quality videos and low quality video? How would you try and get advertising revenue out of high quality videos?

Q4. If you were a company CEO and you read this interview of Sergey Brin, what kind of questions would you ask? How would you build your business around those questions?

Q5. If you were asked by Sergey Brin to head AdSense, what would your strategy be? How would you try and make AdSense better? [use the information given in the passage]

Activity

Q1. Observe Question3, it starts with an evaluation question and then gets into a synthesis question. Are evaluation questions a prerequisite to synthesis questions?

Q2. How does an understanding the previous five levels (Knowledge, Comprehension, Application, Analysis and Evaluation) help in solving Synthesis questions?

Q3. Why ask synthesis questions? Why create something? Does a CEO create strategies? What does a lawyer create? What about a doctor?

Q4. Can you design 5 synthesis questions around your chosen text?

Q5. What are the learning outcomes of the questions designed by you?

Activity9- Guszak's Classification

"It has to do with curiosity. It has to do with people wondering what makes something do something. And then to discover, if you try to get answers, that they are related to each other – that things that make the wind make the waves, that the motion of water is like the motion of air is like the motion of sand. The fact that things have common features. It turns out more and more universal. What we are looking for is how everything works. What makes *everything* work.

What happens first in history is that we discover the things that are on the face of it obvious. And then gradually we ask small questions, and then we dig in a little deeper into things that we need to do a little more complicated experiment to find out about. But it is curiosity as to where we are, what we are. It is *very* much more exciting to discover that we are on a ball, half of us sticking upside down and spinning around in space. It is a mysterious force which holds us on. It's going around a great big glob of gas that is fed by a fire that is completely different from any fire that we *can* make (but now we can make that fire – nuclear fire.)

That is a much more exciting story to many people than the tales that other people used to make up about the universe – that we were living on the back of a turtle or something like that. They were wonderful stories, but the truth is so much more remarkable. So what's the pleasure in physics for me is that it is revealed that the truth is so remarkable, so amazing, and I have this disease – like many other people who have studied far enough to begin to understand a little of how things work. They are fascinated by it, and this fascination drives them on to such an extent that they have been able to convince Darwins and so on to keep supporting them in this investigation which is a race is conducting into its own surroundings"- Richard Feynman, in an interview with Yorkshire Television, in 1973

Types of questions, as classified by Guszak. Design atleast five questions of each type.

Recognition - literal comprehension skills -locating information from reading context.

Q1. Can you find the sentence which narrates a fictitious story which explain the origin of this world?

Q2. Can you find the part of the passage which talks of the similarities of various particles around us?

Q3. Can you find the sentence which explains that we don't completely understand gravitational force?

Recall - Comprehension by the recall of materials previously read.

Q1. What does Feynman refer to as "disease"?

Q2. Who understands that truth is remarkable?

Q3. Which fire is different from any other fire that we can make?

Translation - render an objective, part for part rendering of a communication. As such the behavior is characterized by literal understandings in that the translator does not have to discover intricate relationships, implications, or subtle meanings.

Q1. What does Feynman mean by "keep supporting them in this investigation"?

Q2. Why does Feynman say "things have common features"?

Q3. What do you mean by " like the motion of air is like the motion of sand"?

Conjecture(guess) - What will happen/ What might happen. As such, the conjecture is an anticipatory thought and not a rationale, i.e., "Do you think he will win the race?" (Answer not known at time of question and response.) [Guszak opined that Conjecture questions brought out a "cognitive leap"]

Q1. Can we find out 'deeper' details of things, without conducting experiments?

Q2. If you were asked to explain science and you told the turtle story, would people believe you?

Q3. Which story would excite people- the turtle story or the fire story?

Explanation: provide a rationale such as the "why" or "how" of a situation. The rationale must be inferred by the student from the context developed or go beyond it if the situation is data poor in terms of providing a rationale.

Q1. Why do you think Feynman compares the motion of wind with the motion of sand?

Q2. Why did Feynman explain the turtle story?

Q3. How do scientists stay motivated?

Evaluation: matters of value rather than matters of fact or inference and are thus characterized by their judgmental quality (worth, acceptability, probability, etc.).

Q1. Would you prefer the turtle story or Newton's Theory of Gravitation? Which story is more interesting? Does an interesting story have to be true?

Q2. Do you agree with Feynman that things have common features and this pattern is 'universal'? [What do you mean by universal? Does this pattern apply everywhere?]

Q3. Do you think it exciting to conduct experiments and find out the truth, as stated by Feynman?

Activity 10- Shreiber's Classification-I

"Ashoka has seen the bloodshed with his own eyes and felt that he was the cause of the destruction. The whole area of Kalinga was plundered and destroyed. Some of Ashoka's later edicts state that about 100,000 people died on the Kalinga side and almost equal number of Ashoka's army, though legends among the Odia people (the present day descendants of Kalinga's natives) claim that these figures were highly exaggerated by Ashoka. As per the legends, Kalinga Armies caused twice the amount of destruction they received. Thousands of men and women were deported. Ashoka after seeing this was filled with sorrow and remorse.

Ashoka's response to the Kalinga War is recorded in the Edicts of Ashoka. The Kalinga War prompted Ashoka, already a non-engaged Buddhist, to devote the rest of his life to Ahimsa (non-violence) and to Dharma-Vijaya (victory through Dharma). Following the conquest of Kalinga, Ashoka ended the military expansion of the empire, and led the empire through more than 40 years of relative peace, harmony, and prosperity.

"Beloved-of-the-Gods, King Priyadarsi, conquered the Kalingas eight years after his coronation. One hundred and fifty thousand were deported, one hundred thousand were killed and many more died (from other causes). After the Kalingas had been conquered, Beloved-of-the-Gods came to feel a strong inclination towards the Dharma, a love for the Dharma and for instruction in Dharma. Now Beloved-of-the-Gods feels deep remorse for having conquered the Kalingas. "

According to oral histories, a woman approached him and said, "Your actions have taken from me my father, husband, and son. Now what will I have left to live for?" Moved by these words, it is said, that he accepted/adopted Buddhism, and vowed to never take life again."- Wikipedia

Construct atleast ten questions based on any passage from any social sciences text, few examples are given.

RECALL:

R1- Recall of facts:

Q1. Name the religion practiced by Ashoka.

Q2. How many people died in the Kalinga war?

Q3. What is the other name of Ashoka, which is mentioned in the passage?

R2- Arranging facts in sequential order:

1- Woman questioning Ashoka , 2- Lakhs of people die, 3- Ashok converts/adopts Buddhism

4- Kalinga War, 5- Kalinga kingdom is conquered

ANALYTIC:

A1- Making comparisons

Close to 2,00,000 people died in the Kalinga War. How big is that number? With what wars would you like to compare it? Would you compare it with present day scenario or other wars during that time? Do you think proper data can be obtained if you'd like to compare these numbers with ancient wars? Why

are estimates of Kalinga war available while that of several other wars of the same time period aren't?

A2- identifying supporting facts
Did Ashoka really give up wars after the Kalinga war? What should have happened if he didn't give up war? How can we find out if he didn't give up war?

A3- drawing conclusions
Did Kalinga kingdom see more wars after the annexation by Ashoka? Was the kingdom stable? Was Kalinga kingdom peaceful after the conquest?

CREATIVE: Speculating on outcomes
What would have happened if Ashoka didn't convert to Buddhism, after the Kalinga war?

Activity 11- Schreiber's Classification-II

EVALUATIVE:

E1- Identifying main part and important parts

What does the passage try to convey? How can the passage be broken into sections? Can you think of headings for each of the sections?

E2- stating moral judgment

Was Ashoka right in going for a war? Did he achieve peace through war? Is it okay to kill a lot of people even if it brings peace?

E3- stating judgment based on personal experience

Would you prefer a peaceful country or one which frequently fights against other countries?

E4- evaluating quality of source material

How do we know the number of people who died in the Kalinga war? Why do the official estimates disagree with what the Odia legends state?

E5- evaluating adequacy of data

Whose military strategies were better- Ashoka or Kalinga kingdom? Is the data sufficient? What additional information would be required?

OTHER: Describing situations, defining and clarifying information, using globes, using maps, uncovering information & raising questions for study.

Activity 13- Learning by Questioning

We have finished 9 activities and 3 Socratic Dialogues so far. So what did we learn?

1- Why do we use Socratic Questioning? What kinds of questions does it provide? Does it help us in analyzing arguments? Does it help in rebutting arguments or in thinking of the same arguments through newer perspectives? [LOGIC]

2- Why do we use Bloom's Taxonomy? Does it help in evolving our understanding of a concept? How do you ask questions to improve your understanding, using Bloom's Taxonomy? [CONCEPT]

3- Why do we use Shreiber's Classification? Why is it useful in Social Sciences? What kinds of questions come up in Social Sciences? Why study perspectives? How to study the society? [PERSPECTIVES]

4- Why do we use Guszak's reading inventory? How does it help in understanding the contents of a passage? [COMPREHENSION]

5- If you have a problem in learning something, what kind of questions should you ask?

Case Study1- Technical Reading

Strong biological, psychosocial, and economic arguments exist for intervening as early as possible, starting from and even before conception, to promote, protect, and support children's development. An emphasis on the first years of life is articulated within a life course perspective. High-quality care in families, child day care services, and preschools during the earliest years needs to be followed by high quality schooling and services into adolescence in order to capitalize on inter-dependence between investments made in the successive stages of the life cycle.

Multi-sectoral interventions, with health services as an entry point, are particularly well-placed to reach children early with services that support families to deliver nurturing care and promote, protect, and support early childhood development. Interventions to promote nurturing care can feasibly build on existing health and nutrition services at only a limited additional cost. Coordination with education is needed to promote learning, and with social and child protection, to reach the most vulnerable populations.

Evidence consolidated in this series points to effective interventions and delivery approaches at a scale that was not envisaged before. During the next fifteen years, world leaders have a unique opportunity to invest in the early years for long-term individual and societal gains and achievement of the Sustainable Development Goals. All sectors must play their part in supporting families to provide nurturing care for children. However, the time has come for the health sector to expand its vision of health beyond prevention and treatment of disease to include the promotion of nurturing care for young children as a critical factor in the realisation of the human potential of all people.

- "Advancing Early Childhood Development: from Science to Scale", The Lancet, Oct 2016

Guszak

1- Were the contents of the passage clear? Ask 2 recall questions and 2 recognition questions, based on the passage.
2- Did we miss any details? Can we try and interpret the passage in our own words? Can you ask two Translation questions?
3- Can you think of 2 Conjecture questions around the passage? Why would you want to extend the arguments of the report, to think of newer situations?
4- Did you understand the arguments in the report? Would you want to ask two explanation questions?
5- Do you agree with the arguments in the report? Would you want to ask two evaluation questions?

Socratic Questioning

1- Are ambiguity(inexact or open to interpretation) in the report? Would you want to ask two clarification questions?
2- Do you agree with the arguments? Any probing assumption or probing reasoning questions?
3- If the author is right, what about the consequences? Any probing assumptions/consequences questions?
4- Can we look at the problem through newer perspectives? Any Alternative Viewpoint/Perspectives questions?
5- Do these questions help you in acquiring breadth of knowledge as well as depth? Do you understand multiple concepts explained in the passage? Can you think of more perspectives? Are you able to probe each of the perspectives intensively?

Bloom's Questions

1- Can you ask a Knowledge question? How is this different from a recall/recognition question?
2- Do see a sentence which needs to be understood carefully? Can you think of a comprehension question?
3- Can you think of any applications of the concept understood by you in step-2? Can you ask an application question?
4- Can you probe the details of applications? Can you ask an analysis question?
5- Do you use any choices while applying the concept? Can we ask an evaluation question?
6- Can we create something new with these concepts? Can you think of a synthesis question?

Shreiber Questions

1- Definitions/Clarifications- are the terms/concepts carefully defined?
2-Any factual questions? Recall or Sequential Order questions?
3- Any analytic questions? Do you agree with the data? How can you make sense of the data?
4- Any evaluation questions? Does the passage require you to evaluate moral judgments?
5- More questions? If WHO appoints you as a consultant, what additional questions will you ask? What additional data will you gather around the topic?

Activity 14- Case Study3- Poem

Whose woods these are I think I know.
His house is in the village though;
He will not see me stopping here
To watch his woods fill up with snow.

My little horse must think it queer
To stop without a farmhouse near
Between the woods and frozen lake
The darkest evening of the year.

He gives his harness bells a shake
To ask if there is some mistake.
The only other sound's the sweep
Of easy wind and downy flake.

The woods are lovely, dark and deep,
But I have promises to keep,
And miles to go before I sleep,
And miles to go before I sleep.

- Stopping by Woods on a Snowy Evening,
Robert Frost

queer- strange **harness bells-** a type of a bell which produces a typical sound on shaking

Socratic Questions- Logic
Q1. What does the author mean by "harness bells a shake" [Clarification]
Q2. Why does he think that the woods' owner lives in the village? [Probing Assumption]
Q3. Why does the author think that the woods' owner won't see him stop there? [Probing Reason]
Q4. What would happen if the author stays back at the woods? [Implications and Consequences]
Q5. Did the horse shake his bells to ask if there was a mistake from his end? Could we have any other reason? [Alternative Viewpoint/Perspective]

Guszak Inventory - Reading
Q1. Show a sentence which suggests that the author has important work to do? [Recognition]
Q2. What does the author mean by "My little horse must think it queer"? [Translation]
Q3. What do you think were the "promises" which the author had to keep?[Conjecture]
Q4. Why does the horse find it strange?[Explanation]
Q5. Do you think the woods would be beautiful, when it snows? [Evaluation]

List as many questions as you can, draw a few question trees

Case Study4: Poem2

"Where the mind is without fear and the head is held high
Where knowledge is free
Where the world has not been broken up into fragments
By narrow domestic walls
Where words come out from the depth of truth
Where tireless striving stretches its arms towards perfection
Where the clear stream of reason has not lost its way
Into the dreary desert sand of dead habit
Where the mind is led forward by thee
Into ever-widening thought and action
Into that heaven of freedom, my Father, let my country awake"

- Rabindranath Tagore

fragment- a small part broken from something
dreary- a depressingly dull and bleak(land without vegetation) or repetitive

Socratic Questions

Q1. What does the author mean by "ever widening thought and action" [Clarification]
Q2. Does the author think that our world is broken into fragments? If yes, why does he think so? [Probing Assumption]
Q3. What does the author refer to as "deary desert sand of dead habit"? [Clarification]
Q4. If a school is designed as described in the poem, would the students like it? [Implications and Consequences]
Q5.Do you agree with the author that blind belief is a "dead habit"? [Probing Assumption]

Guszak Inventory

Q1. Show a sentence which suggests that the author wants people to be curious? [Recognition]
Q2. What does the author mean by "narrow domestic walls"? [Translation]
Q3. Would the author support Khan Academy (which provides free online lectures)?[Conjecture]
Q4. Why does the author want the mind to be without fear?[Explanation]
Q5. Do you think it is a good idea to compare reason with "clear stream" and superstitions with "desert"? [Evaluation]

List as many questions as you can, draw a few question trees

Activity 15- Case Study3- Numbers

There were six friends- Ahmed, Bhaskar, Charles, Donald, Eshwar, Farooq and George who went on a treasure hunt. Ahmed found the treasure with a lot of diamonds. Just then Bhaskar entered there. Ahmed and Bhaskar decided to share the diamond and run away with them. However, one diamond was left, when they tried to divide the diamonds equally.

Charles then joined them. They decided to share the diamond, but then two diamonds were left out. Donald joins and three diamonds were left out. Eshwar joined and four diamonds were left out. Farooq joined in and five diamonds were left out. But when George joined in, they could share the diamonds equally. What is the least possible (non-zero) number of diamonds in the treasure?

Solution

For a moment let us assume that a monkey dropped one diamond from the treasure. In that case, two friends could have shared the diamonds equally. This is because the remainder was 1 in each of the cases, but then that one diamond was added by the monkey.

Three friends could have shared them, as the remainder was 2 and the monkey added one diamond into the treasure. Likewise Four friends could have shared, five friends could have shared and six friends could have shared them equally.

If the number is divisible by 2,3,4,5 and 6, then the number is divisible by the LCM of 2,3,4,5,6 which is 60. So the number of diamonds in the treasure is a multiple of 60. But then, one diamond was added by the monkey, so actual number of diamonds could be 60-1 or 120-1 or 180 -1 or any multiple of 60 subtracted by 1.

But we know that the total number of diamonds is a multiple of 7. So the answer cannot be 59. 119 is a multiple of 7. So, the answer can be 119 and 119 is the least possible number which follows all the required properties. So, the answer is 119.

Technique Summary

1- Write down the information

Divided by	2	3	4	5	6	7
Remainder	1	2	3	4	5	0

2- Strategy
Add one to the total number of diamonds

Divided by	2	3	4	5	6	7
Remainder	0	0	0	0	0	1

3- Number of diamonds+1 should be divisible by 2,3,4,5,6, so it should be divisible by 60

4- Number of diamonds+1 can be 60, 120, 180 or any positive multiple of 60

5- Number of diamonds can be 59, 119, 179 or ((any positive multiple of 60) -1)

6- Number of diamonds should be a multiple of 7, so it cannot be 59, it is 119.

Questions:

Q1. Why did we assume that a monkey dropped a diamond?

Q2. What was the advantage of increasing the number of diamonds by 1? Why did we want the number to be divisible by 2,3,4,5,6?

Q3 If a number is divisible by 2,3,4,5,6, why should it be divisible by its LCM?

Q4 How did we get the numbers 59, 119 and 179?

Q5 Why should the number be divisible by 7?

Comments

1- In Mathematics, there are a lot of new techniques which could be used. It is alright if you can't think of a technique. Most students can't think of the idea of adding 1 to the total number of diamonds.

2- The idea is now that you have the mathematical experience of solving this problem, how do you use this same technique in other situations.

3- So, you might want to write down the technique (an overview of the steps) on a piece of paper and then critique the steps.

Design more Problems which can use the same technique

Divided by	2	3	4	5	6	7
Remainder	1	2	3	4	5	6

Divided by	2	3	4	5	6	7
Remainder	1	1	1	1	1	1

Divided by	2	3	4	5	6	7
Remainder	1	2	3	1	5	6

Case Study-5: Algebra

Find the lowest value of $x^2 + 10x + 101$

Solution:
Complete the perfect square: $x^2 + 2 * 5 *x + 5^2 + (101- 5^2)$ [As $a^2 + b^2 + 2 *a *b = (a + b)^2$]

$=(x + 5)^2 + (101-25)$

$= (x+5)^2 + 76$

$(x+5)^2$ is a perfect square and its only lowest value is 0, if x is real

So, lowest value of $(x+5)^2 + 76$ has to be 76

Questions to Ask

1- Why did we complete the perfect square?

2- Why is a perfect square's value either zero or positive? Is a negative number's square negative?

3- How did you get the idea of completing a perfect square?

4- Why did we add and subtract 25?

5- How do we complete a perfect square?

6- Can the same technique be used to find lowest value of cubes? Do cubes have a 'lowest' value?

7- Can the same technique be used to find lowest value of 4th powers? Do they have a lowest value?

8- Do even powers have a lowest value? When x is negative and running towards infinity, what happens to even powers of x?

9- Do odd powers have a lowest value? When x is positive and running towards infinity, what happens to odd powers of x?

10- Where else can I apply this technique?

Design More Problems using the same technique

1- Express the following expression in the form $a^2 + N$

(i) x2 + 6x + 60

(ii) x2+ 12x+ 11

2- Can we use the same technique to solve $x^4 + 100x^2 + 101$?

Summary