

## BITS APOGEE Aarohan Socratic Dialogue

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### General Instructions

- Students can send in their research write-ups in teams of three
- There are two parts- Analysis and Synthesis
- The best team which would have submitted the best research shall present during the event.
- Describe the background work which was done to complete the research report.
- If you disagree with any implicit assumptions in the question, please state explicitly.
- All Analysis questions are to be answered within 400 words (all answers together)
- All Synthesis questions are to be answered within 400 words (all answers together)
- Sciensation is very generous when it comes to awarding points!
- Interesting wrong answers receive more credits than correct answers.

### Selection Criterion

- Originality- The originality of the thought process involved.
- Reasoning- The arguments/assertions need to be justified.
- **Perspectives** - exploring the issues from the point of view of all stake holders.
- Rigor- have you evaluated the arguments critically?
- Creativity- Out of the box solutions to the problems

### Scoreboard

	Originality	Reasoning	Perspectives	Rigor	Creativity
Analysis: P1	/5	/5	/5	/5	/5
Analysis: P2	/5	/5	/5	/5	/5
Analysis: P3	/5	/5	/5	/5	/5

	Originality	Reasoning	Perspectives	Rigor	Creativity
First Theme	/5	/5	/5	/5	/5
Second Theme	/5	/5	/5	/5	/5

Best of Two:

Total (Analysis + Synthesis):

## Analysis Questions

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### **A1: Experiment Design**

Design an experiment to test any hypothesis which answers a question. For instance, in the orientation we discussed why female literacy rate in India is quite low. If your hypothesis is ignorance, you can test this hypothesis by testing a sample of people who are ignorant/not ignorant and if they are willing to send their girl child to a school.

### **A2: Identifying Variables**

Multiple variables may have to be factored in while analyzing a real life scenario. For instance in the cake example, we saw that quantity/quality of ingredients, presentation, expertise of the chef, procedure are some of the variables which affect the quality of the cake. Identify the variables in your experiment, which you've designed in A1.

### **A3: Engineering a solution**

While scientists study nature and develop our understanding of the world, engineers leverage this understanding to solve problems. Think of an example of how the wisdom developed through your experiment could be used to develop a solution for a certain problem. Alternatively you could also design an experiment to understand your problem and then think of a solution.

For instance, if your experiment suggests that bad sanitation is the root cause of low female literacy, you could think of technological solutions for this. Maybe a mobile app which lets citizens communicate the conditions of government schools.

## Synthesis Questions

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### **S1: Solving friction due to the rails**

This question is based on the hyperloop passage given in Aarohan's questionnaire. A vehicle faces resistance from the surface on which it rests. How can this friction be reduced or eliminated?

### **S2: Solving friction due to air stream**

Aarohan's questionnaire explains that we do not observe a linear effect- that the effort involved in changing speed from 10 to 20kmph is quite different from that in accelerating from 110 to 120. The vehicle has to oppose the air stream which hits it. This air stream gets stronger as the speed of the vehicle goes up. How can this friction be reduced or eliminated?