SATIS 2.0

What if...?

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INTRODUCTION AND SYLLABUS

From an early age, many young 'people delight in fantasising and exploring new situations in their imaginations" This unit can build on this by encouraging students to imagine what the world would be like if various scientific facts or relationships were to change. Students can respond to a 'What if ...?' at a variety of levels and the experience offers a 'fun way'of extending their grasp of both theoretical ideas and the practical implications or applications of science.

Although there are few direct links with syllabuses this unit could be used both in programmes of general education and as a way of raising a variety of issues with students following specialist science courses...

USING THE UNIT

TIMING

A 'What if ...1' discussion usually needs about an hour of class time.

A SUGGESTED APPROACH

The 'What if ...?' may be written on the board or displayed on a screen with an overhead projector. Page 1 of this unit can be copied onto an acetate sheet for this purpose.

Students, either in small groups or together as a class, are then encouraged to display their knowledge, aspirations and problem solving powers in discussion. The teacher acts as coordinator attempting to keep discussion going and perhaps sometimes acting as an expert adviser.

More students will get involved if the discussion starts in small groups of three to five students. Experience suggeststhat such groups should be encouraged to continue to generate ideas for five to ten minutes after their thinking seems to have run dry. Some of the best ideas can arise at this stage. Each group might be asked to present a summary of their thinking to the rest of the class.

Next, some of the major ideas can be developed in more detail. It may be convenient to share out these ideas between small groups for further elaboration before a second reporting back session.

EXAMPLE: 'WHAT IF... THE SUN DISAPPEARED'

This 'What if...?' has been used successfully in a variety of contexts.. There are two possible scenarios. The second version avoids speculation about the Earth's path in space.

1. The Sun has been plucked from the heavens leaving its partners in the solar system behind. Can the human race survive this completely unexpected catastrophe?
2. An enormous cloud of dust has drifted across the Sun so that no sunlight can reach the Earth's surface.

A POSSIBLE STRATEGY FOR TACKLING THE QUESTION:

STEP 1:

Discuss in a class group the implications:

- immediate,
- in the short term - up to one year,
- in the long term - longer than one year.

Take them in order and record the principal problems. It might be appropriate to build up' a spider diagram to summarise the suggested implications.

For example

Immediate

- Warmth and light
- Food and water
- Emergency aid
- Communications
- Ensure the survival of the most 'useful' members of society?

Short term

- Food production in the absence of natural photosynthesis
- Atmospheric cooling - to what extent?
- Will respiration be possible?
- Energy production .
- Re-establishment of communications - radio? TV? Shlps
- ice-bound? Air travel- will the atmosphere freeze?

Long term

- Living with surface temperature near absolute zero.
- Could life continue underground tapping geothermal!
- nuclear energy sources?

STEP 2:

Break up into smaller groups each discussing a major issue in greater depth

STEP 3:

Come together again and allow each group to present its findings.

STEP 4:

Finally:
A: Assess whether long-term human survival is possible,

B: If the answer to A is yes, estimate what proportion of today's world population of 5-6 billion has a long-term future in the circumstances.

OTHER POSSIBILITIES FOR 'WHAT IF?' DISCUSSIONS

The following questions for discussion have been suggested by students and teachers.

What if ...

- Ice were denser than water?
- All transparent substances had the same refractive index?
- All metals ceased to conduct electricity?
- The Earth stopped rotating about its axis?
- The Earth was not tilted?
- The Earth did not have a geomagnetic field?
- The core of the Earth cooled?
- There was suddenly no gravity?
- The Earth and everything on it were reduced to half its present size?
- Humans did not need to sleep?
- Humans did not grow old?
- Humans lived for ever?
- Humans could see other electromagnetic waves besides light?
- The percentage of oxygen in the atmosphere were doubled?
- There was no ozone in the Earth's atmosphere?
- The ice-caps melted?
- There was a nuclear holocaust?