



Is There Life On Earth?

Middle grades

Lesson Summary

Students imagine they are Titanian scientists planning a mission to search for life on planet Earth. Students research the instruments carried aboard Cassini-Huygens and then work as a group to determine what questions the Titanian scientists would want their mission to answer.

Prior Knowledge & Skills

- Web research

AAAS Science Benchmarks

The Nature of Science

Scientific Inquiry

NSES Science Standards

- **Science as inquiry:** Abilities necessary to do scientific inquiry, Understandings about scientific inquiry
- **Science and technology:** Understandings about science and technology

Teaching Time: One 45-minute period

Materials

Each group needs:

- Access to a computer or other source of Cassini-Huygens background information

Advanced Planning

Preparation Time: 30 minutes

1. Review the background material
2. Review the lesson plan

Science context

NASA's first Mars landers, Viking 1 and 2, set down on Mars in 1976 armed with a set of experiments designed look for life on the Red Planet. Most scientists agree that Viking did not detect life, though some of its instruments may not have been sensitive enough to find Mars microbes even if they did exist. Most missions since Viking, like NASA's Spirit and Opportunity rovers, haven't looked for life itself; instead, they have checked for conditions—like liquid water—that life needs to survive. The Beagle 2, which was intended to pick up the search for life where Viking left off, suffered a failure after landing on Mars in 2003, and hasn't been heard from since.

Suggested background reading

The Recipe for Life

Debate on Mars life rages long after Viking

Mars rocks once "water drenched"

Source: *Particle Physics and Astronomy Research Council*

Is there life on Earth?

You are President of the Titanian Scientific Council (TSC). That means that you are allowed to wear three shiny red pointy hats. One for each of your heads. It also means that you have to supervise planning of a space mission to a faraway planet called Earth. The big question on Titan is, "Is there life on Earth?"

Some Titanians think it's a silly question. "How could anything survive so close to the Sun?" they say. "And they could be hideous monsters. Perhaps they only have two heads. Or worse, only one. Gross! Perhaps a lot of the surface is covered in green material that grows. Amongst that green stuff there could be all sorts of creepy-crawlies."

But you are determined that the mission should go ahead. Your spacecraft will not carry any Titanians. The journey is too far. You will have to send instruments that detect features of the Earth. Perhaps you can use a carefully designed parachute to send some instruments down to the Earth's surface. The instruments will send information back to Titan by using radio waves.

You call a meeting of the Council. You ask for suggestions about what are the most important things you want to find out about Earth.

Useful Links:

<http://saturn.jpl.nasa.gov/overview/index.cfm>

<http://saturn.jpl.nasa.gov/overview/mission.cfm>

<http://saturn.jpl.nasa.gov/mission/index.cfm>

Action

Now imagine that you are in a classroom on Earth. (That part should be quite easy.)

Make a list of the questions that you think the Titanian scientists will want to ask about Earth.