



Satellite Mobiles K-2

Lesson Plan

Overview

In this lesson, students will explore satellites and their functions. A provocative photo essay will introduce students to many kinds of satellites and the jobs they do (e.g., communication, collect weather information, take imagery of the Earth and space, relay information, etc.). Students will then design and construct their own "satellite" out of readily available materials.

Suggested Lesson Sequence	Please see Foundations: Maps and Images module description.
Level	Entry
Science Connections	<ul style="list-style-type: none">Students will identify various functions and purposes of satellites.
Technology Connections	<ul style="list-style-type: none">Students will extend their understandings of space technology by designing, constructing, and describing their own satellites.
Lesson Assessment Tools	<ul style="list-style-type: none">Assessment and Standards Summary TableAssessment Activity DescriptionExtensions for Authentic Assessment

Materials

- Satellite Mobiles slideshow ([Powerpoint](#))
- Satellite Mobiles movie ([Quicktime](#)), starring Pixel the Satellite. Note: this file is stored in the Satellite Mobiles (3-5) folder.
- Various materials for satellite construction that may include:
 - Cardboard tubes
 - Scissors
 - Glue
 - Toothpicks
 - Aluminum foil
 - String
 - Colored paper
 - Crayons

- Paper plates
- Various other materials for decoration and construction

Vocabulary

Satellite: An object (natural or man-made) that orbits another larger object (a planet, a star, etc.).

Procedure

This lesson introduces the various functions that satellites perform as students observe pictures and diagrams of real satellites.

I. Assessing Prior Knowledge

You may wish to begin your assessment of students' prior knowledge of satellites by asking the following question:

- How is it possible that millions of people all around the world could watch the Super Bowl "live" on television - that is, as it actually happens - even though they might be hundreds or thousands of miles from the stadium?

This question will help you assess whether or not students understand that information can be transferred great distances, and very rapidly, through the help of satellites. More generally, teachers might also ask students to share what they know about satellites - what they look like, what they do, and where they might be found. As another pre-instruction assessment, you might have students draw a picture of a satellite.

II. Contextual Preparation

Background Information

Using your assessment of prior knowledge, engage students in further discussion about satellites. In addition to man-made satellites, it is also important to recognize natural satellites. The moon - a natural orbiting object - is a satellite of the Earth. You might wish to encourage conversation about the primary functions of satellites - aiding in communication, transferring data, taking images of the Earth, collecting data in the atmosphere, relaying/transmitting signals (such as TV), and aiding in weather description and prediction.

To help introduce this lesson, a one-minute Pixel the Satellite "[Satellite Mobiles](#)" movie is

available for your use in the classroom. You may wish to play this animation using a computer on a large screen at this time. This animation has been designed to help excite students about the lesson, as well as to set the stage for the lesson context. The transcript of this Pixel the Satellite Animation is as follows. (This and all other Pixel the Satellite Animation [transcripts](#) can be printed for students with hearing impairment.)

SATELLITE MOBILES ANIMATION:

(Pixel is looking quizzical) "1. Can you help me answer a question? 2. What exactly *am* I?? 3. My name is Pixel, and I am a satellite, but *what is* a satellite?? (4. looking pensive, saying "Let's see here..." then grabbing a book and leafing through 2 book pages until finding the right one) 5. Aha! My handy little dictionary says, 6. 'a satellite is a natural or human-made object that orbits around another larger object such as a planet'. 7. Now it all makes sense! 8. I orbit around a large object, the Earth, many times each day! 9. Watch me as I orbit once (camera backs up to show entire Earth with Pixel orbiting once around it and then coming back to the camera). 10. Wow, I saw a lot of neat things down on the Earth during that orbit! 11. Now, I'm off to check out a storm I saw developing over the Pacific Ocean. 12. So I'll turn it back over to your teacher, who will help you learn even more about satellites. 13. See you soo-oon!

III. Student Activities

1. View the [Satellite Mobiles Slideshow](#) with students. In this series of images and photos, students will view pictures that show real satellites and illustrate the various functions that they perform. Children may compare their original ideas about satellites with the pictures in the photo essay. Teachers should monitor discussions that highlight how students revise their impressions of both the form and function of a satellite.
2. The remainder of the lesson is devoted primarily to creating a satellite out of readily available materials. Students should be given random building materials to construct their satellite mobiles. Using their models along with the images in the photo essay, students should be prepared to discuss the various features of their satellites, as well as the services they might provide humans on Earth. Students may wish to hang the mobiles from the ceiling of the classroom.

IV. Assessment

Many informal opportunities for assessment exist in this lesson. Some of these ideas include the following:

- Have students share their satellites with their peers (large or small groups). They should be encouraged to explain *why* they chose certain materials for the satellite. Teachers should look for convergence between the stated purpose of the satellite, and the design of the satellite. (For example, a communication satellite would have a large satellite dish to send and retrieve data.)
- Questions for further assessment might include:

- How do satellites assist humans?

(By facilitating communication (e.g., TV or cellular phones), by providing images of the Earth, by helping to predict weather patterns, etc.)

- How do satellites take pictures of the Earth?

(With special cameras that collect data from the Earth as they orbit above in the satellite.)

- Where do satellites travel?

(Satellites typically orbit the Earth.)

- How are satellites able to reach (and travel) in space?

(Satellites are propelled by rockets into orbit.)

Lesson Extensions for Authentic Assessment

- Students can write or narrate a story about the life of a satellite. They should use their own satellite creation as a model for the story. They should be encouraged to share their knowledge of satellites as they tell the story.
- Students may also be interested to have their satellites take pictures of the classroom or playground. Strap a camera to the bottom of a satellite and use a chair to take "satellite images" from high off the ground. Students can then examine these photos and discuss them in the context of actual imagery gathered from satellites or other cameras. For example, students can examine how objects look different in photos when photographed from the top vs. from the side.