



Sensing Something

Lesson Plan

Overview

In this lesson children will learn that they can gather information about objects using the five senses of vision, touch, smell, taste, and hearing. They will then learn that some sensing, like sight, is done remotely. This lesson sets the stage for young children to understand that interesting and important information about the Earth can be gathered using various devices that create images.

Suggested Lesson Sequence	Please see the Foundations: Maps and Images and Global Visions module descriptions.
Lesson Level	Entry
Science Connections	<ul style="list-style-type: none"> Students will gather information about objects using the five senses of smell, taste, touch, sight, and hearing. Students will explore how visual sensing information is gathered remotely, that is, without touching an object. Students will investigate how visual remote sensing can be used to study the Earth using our eyes, cameras, and other devices that create images.
Math Connections	<ul style="list-style-type: none"> Students learn how to represent spatial patterns by drawing and describing them.
Technology Connections	<ul style="list-style-type: none"> Students will observe how a camera can capture an image that can be kept and studied. Students will learn about similarities and differences between a camera and the human eye.
Lesson Assessment Tools	<ul style="list-style-type: none"> Assessment and Standards Table (Word) Assessment Activity Description Authentic Assessments

Materials

- Powerpoint Reader ([Windows / Mac](#)), [Quicktime Player](#), and [Adobe Reader](#)
- A remote control device (such as for the TV, VCR, or any other electronic device)
- A small edible object for each student (something not messy--e.g. an apple slice, small

- cookie, potato chip, etc.)
- Some pebbles and rocks that have been rinsed off in a sink
- Scrap paper
- A computer with screen and/or computer projection device (audio speakers desired but not required)
- Sensing Something activity sheet ([Word](#))
- Meet Pixel the Satellite movie ([Quicktime](#))
- Sensing something Assessment Slideshow ([Powerpoint](#)). May be shown on a computer screen (or projected) or printed out on paper for students to view. This slide show is meant to be viewed together, as a class. You might have different students read the questions on the different slides.

Vocabulary

- Image: a visual representation of a person or thing
- Information: facts, or data, about something
- Remote sensing: the act of gathering information about an object without touching it
- Remotely: the act of interacting with an object while you are some distance away from the object
- Signal: the way that information is remotely sent from one object to another

Vocabulary Note: Students will likely be unfamiliar with other vocabulary presented in this lesson. This is done intentionally, to spur additional conversations and discussion about these words and their meanings. Encourage your students to ask about unfamiliar words.

Procedure

I. Assessing Prior Knowledge

Introduce this lesson by asking the class to share how they learn (gather information) about things. During this discussion, take note of how each of these learning methods relate to the five senses of touch, sight, hearing, smelling, and tasting, and highlight these five senses to the students on the blackboard. Guide the students to think about and discuss how they use various combinations of their senses to gather information about objects. Perhaps you may have a student in the class who has impaired vision or hearing. If this is the case, ask the student to share how they depend more on their other senses to gather information.

II. Contextual Preparation

This lesson is to build students' awareness of how information can be transferred between objects that are near and far from each other. To build this context in a way that is meaningful to the students' lives, hold up a typical TV or VCR remote control device. Ask what information they think is sent from the remote control to its electronic device (turn on/off,

change the channel, turn the volume up/down, etc.). But what happens if the remote control is lost? How is this information transferred? The students should surmise that the information is transferred by physically touching buttons on the TV/VCR. So, information can sometimes be transferred between things through **physical contact**, and sometimes it can be transferred between things **remotely**. That's why it's called a "remote"! The information is remotely carried between the objects by way of a **signal** that is produced by the remote. Ask students to think about and discuss other remote signals they know about (for example, a lighthouse can send a signal of light to a sailor on a dark and stormy night to relay the information that the shoreline is close by; a remotely controlled car uses the signals it receives to turn and go forward/backward).

III. Student Activities

1. Have each student put a clean and dry rock, a crumpled piece of scrap paper, and a small piece of food on their desk.
2. Pass out a copy of the [Sensing Something Activity Sheet](#) to each student, and instruct them to first draw what they see on their desk using a pencil or crayons. Then, have them describe each object using their other four senses in the corresponding boxes. One-word descriptions such as "cold" or "rough" or "quiet" or "sweet" are fine. The students should also write the object's name in the corresponding box at the bottom.
3. Select some of the students' completed activity sheets and read the descriptions of the objects aloud to the class. Have the class guess which object is being described. Compare and contrast the words used to describe like objects.
4. Ask students to describe which sensory information they gathered by physical contact with the object, and what sensory information they gathered remotely. You may wish to list which senses work through **remote sensing** (sight, sound, smell) vs. which required direct contact (taste, touch) in a table on the board.
5. Now, prepare to show the [Meet Pixel the Satellite movie](#) on a computer screen or projection system. As you prepare, ask students to imagine that they are in a spaceship (satellite) above the Earth and to think silently about how they might gather information about the Earth below. If you do not have a sound system, you may read the movie text aloud to your students:

"1. Hi kids, I'm Pixel the Satellite. 2. I spend my days and nights orbiting the Earth, gathering photos and other information about our planet's many interesting places and living things. 3. From up here, I can see that the Earth is one connected system: 4. see how the Earth looks from hundreds of miles high in the sky? (Shows the big blue marble, in close up view, scans around it for a moment, with Pixel narrating the scene: 5. "Here's the land of North America, the Atlantic Ocean, and some clouds here and there") 6. Together with your teacher, I'll be your guide as we look closer at the Earth and its many related parts. 7. As for

now, I'm off to snap some pictures of some lakes, a few mountains, and maybe even your home town! 8. See you soo-oon!" (Pixel fades off into orbit around Earth.)

You may wish to play the movie more than once, to allow students to fully appreciate the text and animated images.

6. Ask students to think about how Pixel gets information about the Earth. Does Pixel get it by touching the Earth, or remotely? You may remind the students that Pixel was "hundreds of miles high in the sky". After students determine that Pixel must be doing *remote* sensing, follow students' leads and continue a discussion about whether Pixel might smell or hear the Earth if Pixel had a nose or ears like people do. Have students think about how far away they can smell various "smelly" objects, or how far away they can hear loud noises. If time allows, you may even wish to do an experiment in the classroom or on the playground for students to determine smelling/hearing/seeing distances of various objects. Students will build a sense that Pixel would most likely to remotely sense the Earth using some sort of vision or sight. Satellites and their many functions will be discussed at length during later lessons. At this time students may be interested to know that satellites have special cameras that allow them to take visible pictures, or **images**, of the Earth when it is sunlit.

IV. Assessment

Through this lesson, students should be able to:

- List the five senses that people use to gather information,
- Distinguish between senses that are used to gather information remotely vs. those used to gather information through direct contact,
- Understand that some devices (e.g. remote controls, telephones, cameras) can transfer and record information remotely,
- Understand that some spaceships (specifically called satellites) can gather information about the Earth through remote sensing.

Display the [Sensing Something Assessment Slideshow](#) on a computer screen or projector, reading the various assessment questions from the screen. Students may answer orally or in written form. Answers to the questions are self-explanatory.

Lesson Extensions for Authentic Assessment

- What happens when a remote sensing signal is blocked? To find out, do an experiment with the class to try to turn on a TV using its remote control with through more and more sheets of paper. Depending on the strength of the remote control, it may take only one sheet to block the signal, or it may take many sheets. Another question that could be explored is: how far does a remote sensing signal travel? For this experiment, move

progressively farther and farther away from the TV, with students measuring the distance at which the signal drops out. A combination of these experiments can also be done to learn the interaction of signal distance and signal strength (i.e. how enough signal may travel through more pieces of paper at closer range).

- Have students write a story about remote sensing by incorporating each of the vocabulary words listed above. Students may pretend that they are a remote control device or a spaceship. What information would they want to send or gather?
- Students are often curious as to what life would be like without use of one of the five senses. Some students may have friends or relatives who are hearing or sight impaired. Invite a blind or deaf person to your classroom and have them share experiences about how they gather their information. Depriving students of the use of one of their senses (through a blindfold, earplugs, etc.) during part of a school day can also give students excellent experiences along these lines.