

Satellite Missions

Lesson 1 of 2

Grade Level: 5-8

Subject(s): Space Science, Technology, Mathematics

Prep Time: < 10 minutes

Activity Duration: 2-3 class sessions

Materials Category: Special requirements

National Education Standards				
Science	Mathematics	Technology		Geography
		ISTE	ITEA	
5b, 5c, 6a, 6b	2a, 2b, 3a	7a, 7b, 12a, 12b	7a, 8a, 12c	

Objective: To research NASA satellite missions, build a model, and position it on scale showing its relationship to the Sun and the planets.

Materials:

- Internet access
- Craft materials (recyclables, cardboard tubes, toothpicks, aluminum foil, tinker toys, legos, marshmallows, construction paper, glue, pipe cleaners, etc.)
- Adding machine tape
- Markers
- Tape (cellophane, masking, and duck)

Related Links:

Lesson derived from Satellite Creations

<http://set.lanl.gov/programs/LASSO/ACE/ACETchr/Smith/Satellite.html>

Planetary Orbits

http://www.nasaexplores.com/lessons/01-060/9-12_2-t.html

Windows to The Universe

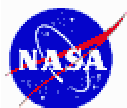
<http://www.windows.ucar.edu/>

Spacelink

<http://spacelink.nasa.gov/.index.html>

Orbital simulation

http://observe.arc.nasa.gov/nasa/education/referance/orbits/orbit_sim.old.html



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Teacher Sheets

Pre-lesson Instructions

- Divide the class into teams of two to four students.
- This lesson requires research. Schedule library and computer time for your class.
- Remind students of your school policy for Internet usage.
- Have students bring in miscellaneous craft and recyclable materials several days prior to beginning this lesson.

Guidelines

1. Read orally the 5-8 NASAexplores article, “What Is Orbit?”
2. Ask students what satellites are used for, where they go, how they travel, what they look like, and the names of any they remember.
3. Explain to the class that they will be exploring several Internet sites to learn about space exploration and satellites. They will choose a satellite mission to research and report to the class.
4. Send teams to your library or computer area.
5. Write the following web sites on the board for the teams to check first to aid in choosing a satellite mission: Spacelink and Windows to the Universe. (See Related Links.)
6. Explain that when using Spacelink, students need to type “satellite missions,” in the search box, and when previewing the Windows to the Universe site they need to go to “Enter the Site,” then “Space Missions.”
7. Instruct the teams that as soon as they find a satellite mission they would like to research, come list it with you. The first team to sign up for a particular satellite mission may do their report on it.
8. Explain that once the teacher approves the topic, the teams will collect information on the mission. (See the chart below.)
 - Mission name
 - Dates
 - Location in the universe (If students need to covert kilometers to miles they will multiply by 0.6.)
 - Size of craft
 - Mission purpose
9. Instruct the teams to make a diagram of their satellites. If a printable picture from the web site is available, the students may use it. The diagram must include labels and clearly indicate the materials to be used to make their models.
10. They will create a model of their satellite with the miscellaneous materials brought to class. It is to be no larger than 3” X 3”, and that it is to accurately match the labeled diagram.



Discussion / Wrap-up

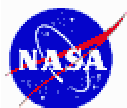
- After teams have completed research and their satellite models, they will share their reports and models with the class.
- Have the class help prepare a scale model of the solar system.
- Use butcher paper to make the planets. The Earth's diameter will be the unit of measure (Earth diameter = 1). Figure out how big the other planets are compared to Earth. Hint: divide each planet's diameter by the Earth's diameter.
- Use adding machine tape to measure distances with 5cm=1 million miles, and display the model on a bulletin board or hallway.
- Have students use the chart for the planets' distance from the Sun and their radiuses. (See the chart on next page.)
- The teams will use the same scale as above, and attach their satellites to the model at the appropriate distance from the Sun.
- Observe the scale models and discuss the following:
 1. Are there any concentrations of satellite missions in a particular area? Why?
 2. What are some of the purposes of NASA missions?
 3. Why do we use satellites?
 4. Why do we explore the universe?
 5. What can space exploration tell us about the Earth?
 6. How do satellites affect our daily lives?

Extensions

- Teams design a larger model of their satellites to be displayed from the ceiling.



Planet Radius And Distance From The Sun		
Planet	Radius (mi)	Distance from Sun (mi)
Mercury	1,516	35,991,300
Venus	3,761	67,246,700
Earth	3,964	92,977,000
Mars	2,111	141,665,630
Jupiter	44,432	483,735,200
Saturn	37,457	888,377,900
Uranus	15,885	1,784,331,900
Neptune	15,380	4,504,300,000
Pluto	721	3,675,276,600



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Student Sheets

No Student Sheets are necessary.

