

2: BUILD A SATELLITE



Materials

A

- construction paper
- [SatCom Relay images](#)
- [Design a Satellite cards](#)
- [Design a Satellite handouts](#)

B

- markers

C

- pipe cleaners
- popsicle sticks
- foil
- tape

Loose Items

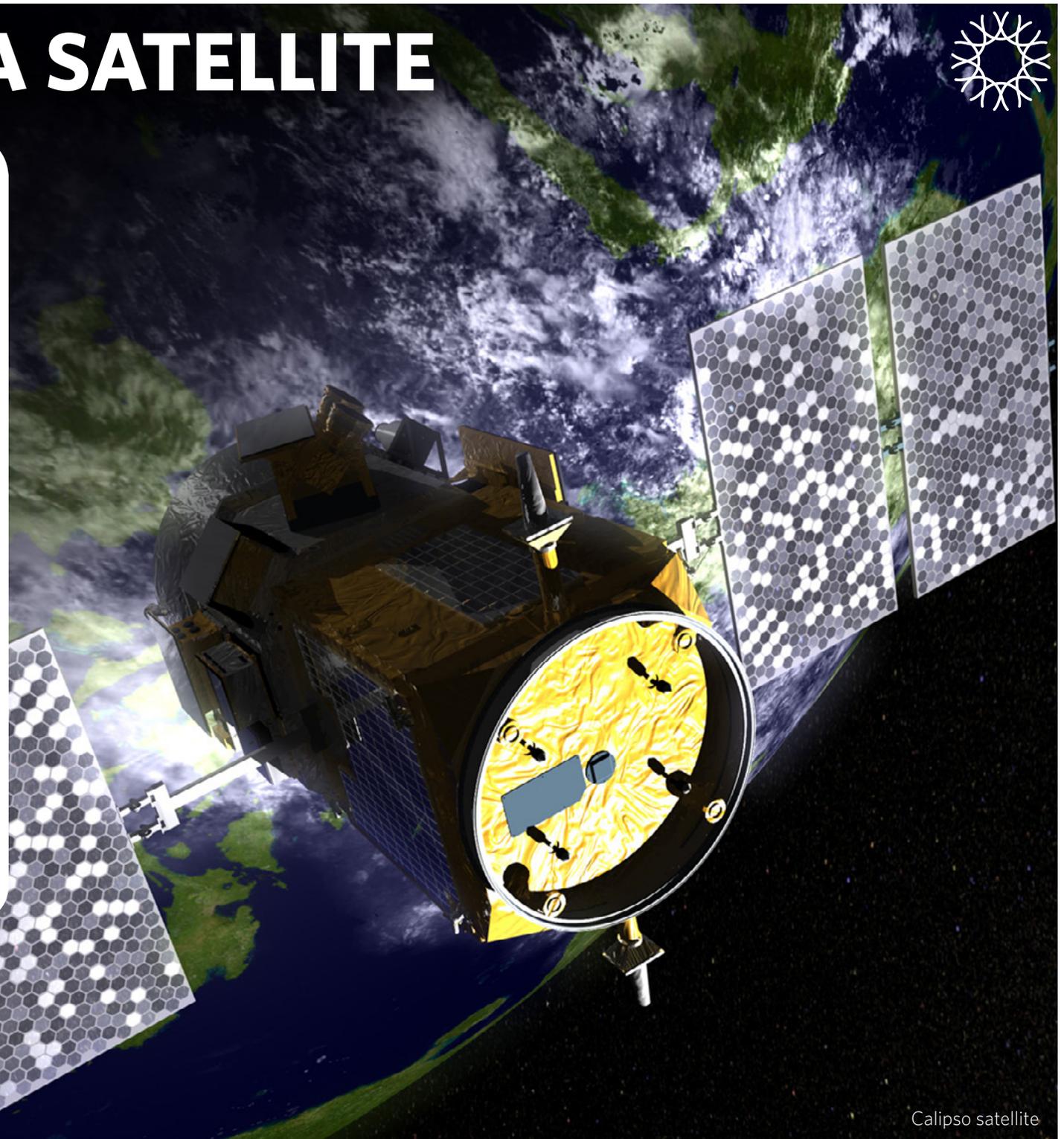
- SAC notebooks

You provide

- recyclable materials

Preparation

- Collect recyclable materials.



Your mission today is to design and build a model satellite.

Satellite Communication (SatCom) Relay

25 min. | inside or outside

What do you think of when you hear the word satellite? What do satellites do? Share some ideas with a friend.

A **satellite** is anything that orbits another object (for example, the Moon is a satellite of Earth). People build satellites to observe Earth and send signals. You most likely use satellites in some way every day, perhaps through television or a map app on your phone.

When a satellite collects data, like photos of objects from space, that information gets translated several times on its way back to Earth—from a photo to computer code to radio signal, and then the same in reverse.

This game simulates that experience, as teams compete to relay information correctly from a satellite's camera to a computer on Earth. This is not a race. The goal is for the final image to match the original *SatCom Relay* photo most closely. The team with the most accurate image at the end wins.

To begin, create five stations at least 20 steps apart from each other. Then, place the four *SatCom Relay* images face down in Station 1 and place markers and paper in Stations 2, 4, and 5. Only players—not materials—can move between stations.

1. Form teams of four players and assign each player a number (1-4).
2. In Station 1—the satellite's camera—Player 1 must look at the *SatCom Relay* image, memorize it, and travel to Station 2 to write a description of it. Make sure no other players see the original image.
3. In Station 2—the satellite's computer encoder—Player 2 must memorize the written description, travel to Station 3, and repeat the description to Player 3. Make sure only Player 3 hears the description.
4. In Station 3—the radio transponder—Player 3 will listen to the description and travel to Station 4 to record it in writing.
5. In Station 4—the radio receiver—Player 4 will read the written description and travel to Station 5 to draw the final image.
6. Station 5 is the computer on Earth. Compare the final image to the original *SatCom Relay* image.

Set up summary:

- Station 1: Four *SatCom Relay* images, face down.
- Station 2: Paper and markers (one set per team).
- Station 3: No materials, but station must be out of earshot.
- Station 4: Paper and markers (one set per team).
- Station 5: Paper and markers (one set per team).

Design a Satellite

25 min. | inside

The goal of this activity is to build a model satellite out of a limited set of supplies.



1. Form five or fewer groups and distribute the *Design a Satellite* cards. These are five satellites that collect data

about Earth’s atmosphere, land, ocean, and energy: Terra, Aqua, Suomi NPP, Calipso, and CloudSat.

2. Look at the cards and talk with your group: What parts do satellites need in order to be able to stay in space for long periods of time? To gather information? To send that information back to Earth?
3. Pass out the *Design a Satellite* handouts, pipe cleaners, popsicle sticks, foil, and recycled materials. Your challenge is to design and build a model satellite that includes the components listed on the handout and at least one moving part.

10 min. | inside

Explore more:

 [Wanna Launch a Satellite? You Can!](#)



Label and Share Your Satellites

1. Put a piece of paper under your satellite. Draw arrows to label the different components on your satellites and describe what they do.
 - What is each component? Why have you decided to place it where it is? How does it move?
 - How will the satellite’s camera and communication device stay pointed toward the Earth as it orbits?
2. Share your satellites with the rest of the club.

Explore more: Watch [Wanna Launch a Satellite? You Can!](#) (3 min.) to learn how to launch your own satellite into space!

Call to action: Human-made satellites can look like stars moving slowly across the sky.

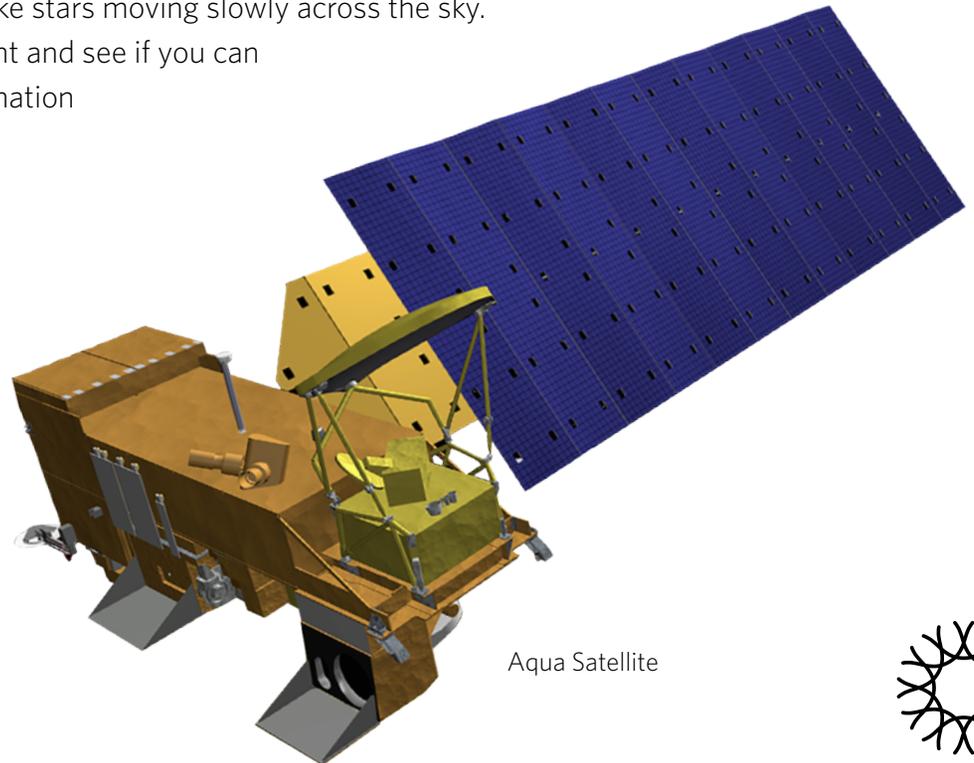
With your friends and family, head outside at night and see if you can spot a satellite orbiting overhead. For more information check out [How to Observe Satellites](#) (5 min.).

 **Call to action:** [How to Observe Satellites](#)



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Attendance & feedback: How many youth attended? How did it go? Record notes here, then click or scan the link to let us know.

How did it go?
[Let us know!](#)



Aqua Satellite

