



Ground Tracks

What path on Earth's surface does the *International Space Station* pass over during its orbit?

To know where the Sally Ride EarthKAM camera can capture images, you need to know where the *International Space Station* (ISS) travels in its orbit around Earth. The path on Earth's surface that lies directly below the space station's orbit is called its ground track.

The ISS doesn't orbit directly around the equator or directly from pole to pole. Instead, it orbits at an angle, as shown in the diagram. The angle of the station's orbit in relation to the equator is its orbital inclination. The point where the space station's orbit crosses the equator on the way up is called the ascending node. The point where it crosses the equator on the way down is the descending node.

If you could mark the space station's ground track on a flat map, what would it look like? Let's find out.

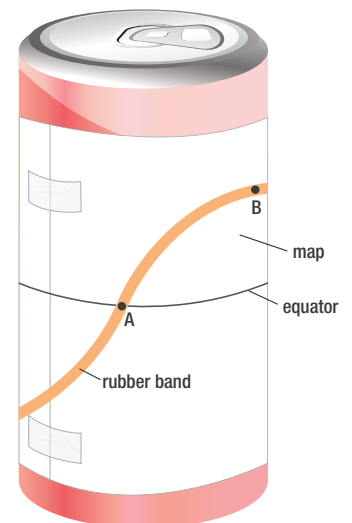
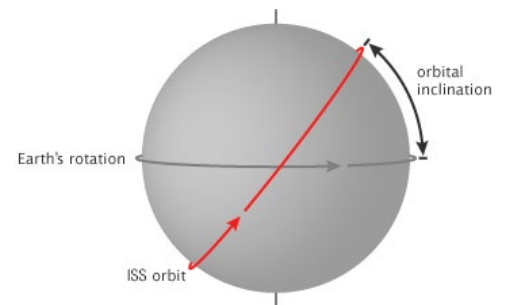
Do the activity

1. Cut out the map on page 3 of the *Ground Tracks* Student Handout.
2. Wrap the map around the soda can and secure it with tape, as shown in the diagram.
3. Place the rubber band around the can at the point where the equator is shown on the map.
4. Use small pieces of tape to secure the rubber band at Point A and Point C on the map.
5. Stretch one side of the rubber band up to Point B on the map. Stretch the other side of the rubber band down to Point D. (If you stretch the rubber band a little higher than point B and a little lower than point D, it will slowly unstretch back to points B and D.)
6. Secure the rubber band to points B and D with tape.
7. Take the tape off points A and C so the rubber band lies smoothly around the can.
8. Use the rubber band as a guide to trace the ground track on the map with a felt-tip pen.
9. Carefully remove the rubber band.
10. Untape the map and take it off the can. Lay it out flat to see the ground track you have drawn.

MATERIALS

For each student group:

- > *Ground Tracks* Student Handout
- > Scissors
- > Soda can
- > Tape
- > Rubber band
- > Felt-tip pen



Interpret your results

1. Describe the space station's ground track. _____

2. Label with arrows on the map the direction the space station moves. What is the direction of its orbit?

3. Label the ascending node. What is the longitude of the ascending node? _____

4. Label the descending node. What is the longitude of the descending node? _____

5. What is the farthest north latitude of the space station's orbit? _____
Mark that point on the map.

6. What is the farthest south latitude? _____ Mark that point on the map.

7. What continents does this particular orbit cross? _____

