



## Teacher Guide

### Ground Tracks

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

**Time:** 40 minutes

#### Objective

Students wrap a world map around a soda can and then use a rubber band to represent the orbit of the *International Space Station* (ISS). They trace the rubber band's position on the map to reveal what the ISS's ground track looks like during a typical orbit.

#### Do the activity

Give students the Ground Tracks Student Handout and have them cut out the map on page 3. Following the directions on the handout, they will wrap the map around a soda can and secure it with tape, as shown in the diagram. They will use tape to secure the rubber band in an orientation that represents the space station's orbit. Then they will use a felt-tip marker to trace the rubber band around the can.

When students remove the map from the soda can, they will see a curved path representing the space station's ground track. They will answer questions about the ground track to help them understand the ISS's orbit.

#### Interpret your results

1. Describe the space station's ground track. *[The ground track of the space station is an S-curve. The track curves down below the equator and then up above the equator.]*
2. Label with arrows on the map the direction the space station moves. What is the direction of its orbit? *[The orbit moves to the East.]*
3. Label the ascending mode. What is the longitude of the ascending mode? *[The longitude of the ascending mode is about 135° W.]*
4. Label the descending mode. What is the longitude of the descending node? *[The longitude of the descending mode is about 5° E.]*
5. What is the farthest north latitude of the space station's orbit? *[The farthest north latitude is about 50° N.]*  
Mark that point on the map.
6. What is the farthest south latitude? *[The farthest south latitude is about 50° S.]*  
Mark that point on the map.
7. What continents does this particular orbit cross? *[The orbit crosses North America and Africa.]*

#### STANDARDS ALIGNMENT

##### Geography

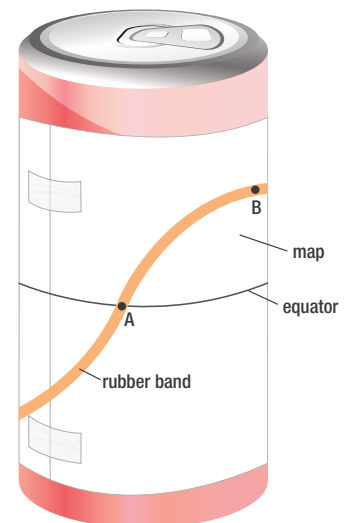
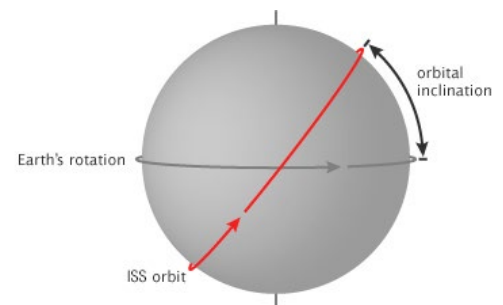
**I.1:** The World in Spatial Terms: How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

**I.3:** The World in Spatial Terms: How to analyze the spatial organization of people, places, and environments on Earth's surface.

#### MATERIALS

For each student group:

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



## Ground Track

