

MAPPING MARS

Background Information

This lesson introduces students to some common map projections and representations (e.g., globes or close-ups) and asks them to consider the ways that each representation can be used to show specific features of [Mars](#). Students will draw three different representations of Mars and will illustrate each one with details of research they have conducted on the planet.

Objective

Upon completion of this activity, students will be able to:

- read and answer questions about different map projections.
- look at pictures of Mars, and explain how they think it would be different to map Mars versus mapping Earth.
- draw pictures representing Mars in three different ways, and illustrate the pictures with details they've learned in their research.

Instructional Time

45–90 Minutes

Materials per team:

Computer with Internet access
Writing and drawing materials

Procedure

1. Show the group a globe and a map, and ask them to explain the benefits of each type of representation of Earth. When does it make more sense to use a globe? When is it better to use a map?
2. Have students read about different types of map projections at [Xpeditions' Globe Projector](#) (click on Standard 1 on the navigation across the top of the page). Ask them to answer these questions in writing:
 - a. Which projection is best to use for navigation? Why?
 - b. What is the advantage of using a polar projection?
 - c. When would it be better to use one of these maps rather than a globe? When would it be better to use a globe?
3. Have students look at [maps of Mars at the MapMachine](#). Ask them what they think would be the differences between mapping Earth and mapping Mars.

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4. Have students look more closely at the Mars map on the MapMachine, and have them zoom in to see the surface of Mars in more detail. Ask them to explain the advantages and disadvantages of drawing a map at this close-up level. What can be shown on this type of map (e.g., specific features such as craters or boulders)? What cannot be shown (e.g., the "big picture" of the Martian surface or surrounding mountains)?
5. Ask students to go to the Web sites on the student pages to gather information about Mars and to find out about some recent research into the red planet. Have them take notes on the topics as they go through the sites. They should note at least three facts or features for each of the three topics.

Discussion

Discuss students' research findings as a class. What have they learned about the technology used to explore Mars and the planet's geology and climate?

Assessment

Have students draw two or three pictures of Mars. Each picture should represent Mars in a different way. One picture should show Mars as a globe, and the other one or two should show Mars in different flat map forms (e.g. a standard Mercator-type projection and a close-up of a specific area).

Once students have drawn their basic representations, have them illustrate each drawing with one specific thing they have learned about in their research, including the technology used to study Mars and its geology and climate. For example, on the Mars globe image, they might draw a picture of Pathfinder approaching Mars and landing on its surface. Before illustrating their pictures of Mars, they should think carefully about which type of Mars representation (e.g. globe, map, or close-up) would be the best to use to illustrate the things they want to show.

Have students conclude by writing sentences explaining why each projection is best for showing that aspect of Mars.

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Extentions

- Have kids do the [Red Album activity](#) on the Expeditions site. Be sure to explore the extras, interactive features, and links on the left side of the page.
- Have students use National Geographic's [Return to Mars](#) site and NASA's [Mars Exploration Program](#) site, as well as other Internet or print resources to find out what evidence exists to indicate that Mars could once have supported life. Have them list this evidence and then list the steps that scientists are planning to take to investigate this question further.

Related Links

[NASA: Mars Exploration Program](#)

[National Geographic: MapMachine—Mars](#)

[National Geographic: Return to Mars](#)

[National Geographic: Xpeditions Activity—The Red Album](#)

Student Name _____ Date _____

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10. Draw two or three pictures of Mars. Each picture should represent Mars in a different way. One picture should show Mars as a globe, and the other one or two should show Mars in different flat map forms (e.g. a standard Mercator-type projection and a close-up of a specific area).