

# Astronomy

## ...and Your Community

### Getting Started

Throughout time, all systems in the universe are affected by processes and outside influences that change them in some way. This includes Earth and the solar system in which it exists. You have years of experience with life on the third planet from the Sun, and you know a lot about your tiny corner of the universe. Think about the Earth in relation to its neighbors in the solar system.

- What objects make up the solar system?
- How far is the Earth from other objects in the solar system?
- Which objects in the solar system can influence the Earth?
- Can you think of any objects or processes outside the solar system that might affect the Earth?

Write a paragraph about Earth and its place in this solar system. After that, write a second paragraph about processes or events in the solar system that could change Earth. Describe what they do and how Earth is, or might be, affected. Try to include answers to the questions above.

### Scenario

Scientists recently announced that an asteroid 2-km wide, asteroid 1997XF11, would pass within 50,000 km of Earth (about one-eighth the distance between the Earth and the Moon) in October 2028. A day later, NASA scientists revised the estimate to 800,000 km. News reports described how an iron meteorite blasted a hole more than 1 km wide and 200 m deep, and probably killed every living thing within 50 km of impact. That collision formed Arizona's Meteor Crater some 50,000 years ago. Such a collision would wipe out a major city today. These reports

have raised concern in your community about the possibility of a comet or asteroid hitting the Earth. Your class will be studying outer space and the effects that the Sun and other objects in the solar system can have on the Earth. Can you share your knowledge with fellow citizens and publish a booklet that will discuss some of the possible hazards from outer space?

### Chapter Challenge

In your publication, you will need to do the following:

- Describe Earth and its place in the universe. Include information about the formation and evolution of the solar system, and about the Earth's distance from and orbit around the Sun. Be sure to mention Earth's place in the galaxy, and the galaxy's place in the universe.
- Describe the kinds of solar activities that influence the Earth. Explain the hazardous and beneficial effects that solar activity (sunspots and radiation, for example) have on the planet. Discuss briefly the Sun's composition and structure, and that of other stars.
- Discuss the Earth's orbital and gravitational relationships with the Sun and the Moon.
- Explain what comets and asteroids are, how they behave,

how likely it is that one will collide with Earth in your lifetime, and what would happen if one did.

- Explain why extraterrestrial influences on your community are a natural part of Earth system evolution.

The booklet should have a model of the solar system that will help citizens understand the relative sizes of and distances between solar-system bodies.

### Assessment Criteria

Think about what you have been asked to do. Scan ahead through the chapter activities to see how they might help you to meet the challenge. Work with your classmates and your teachers to define the criteria for assessing your work. Record all of this information. Make sure that you understand the criteria as well as you can before you begin. Your teacher may provide you with a sample rubric to help you get started.