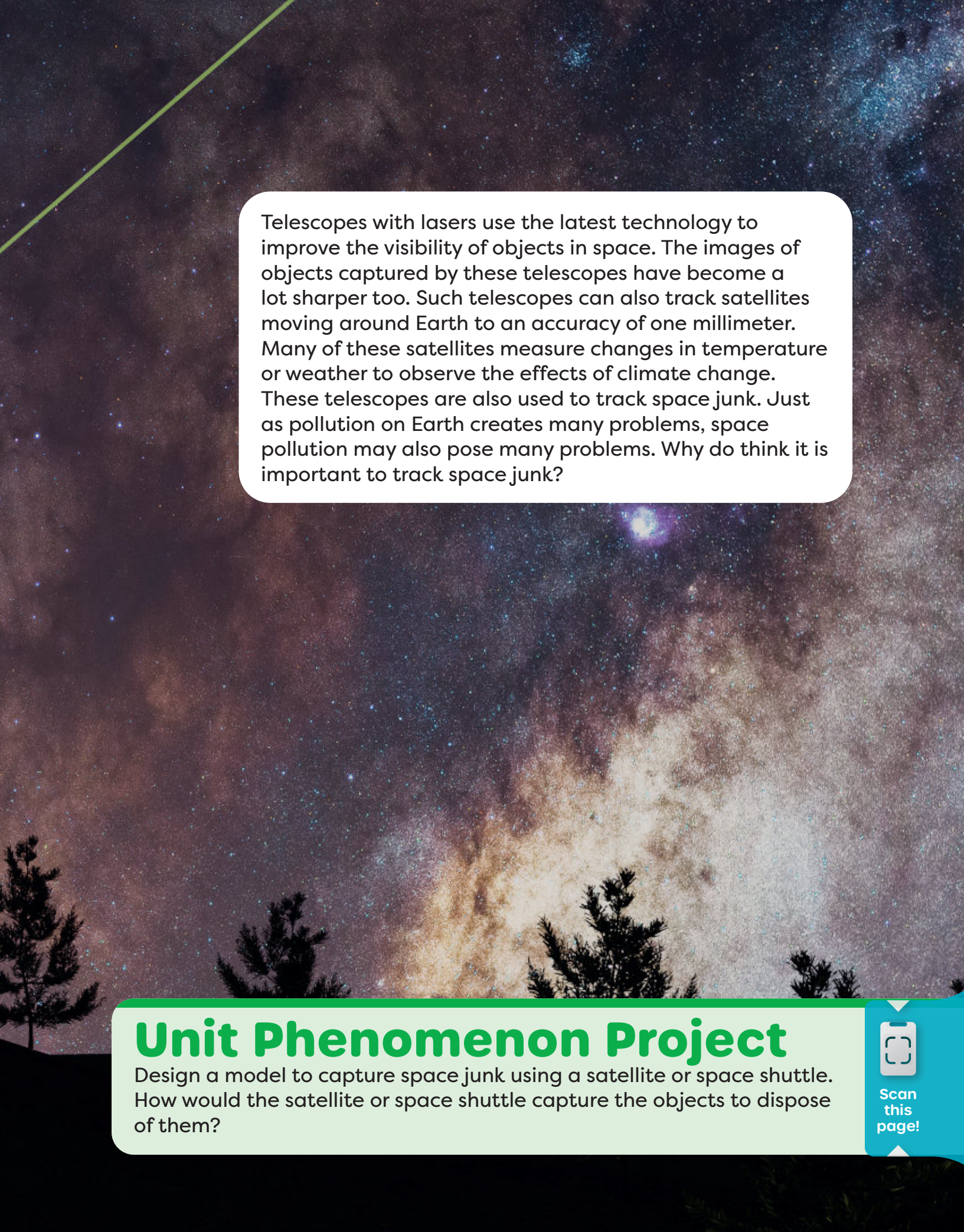
UNIT

3

Earth Sciences

Chapter 3A:
A Sustainable Future

Chapter 3B:
Space Systems



Telescopes with lasers use the latest technology to improve the visibility of objects in space. The images of objects captured by these telescopes have become a lot sharper too. Such telescopes can also track satellites moving around Earth to an accuracy of one millimeter. Many of these satellites measure changes in temperature or weather to observe the effects of climate change. These telescopes are also used to track space junk. Just as pollution on Earth creates many problems, space pollution may also pose many problems. Why do think it is important to track space junk?

Unit Phenomenon Project

Design a model to capture space junk using a satellite or space shuttle. How would the satellite or space shuttle capture the objects to dispose of them?

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Chapter

3A A Sustainable Future

Essential Question
What effects do human activities, such as agriculture, have on Earth?

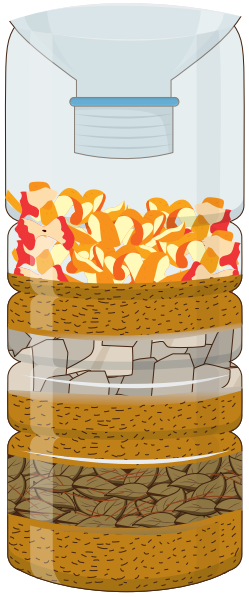
Chapter Project

Compost is a mixture of decayed plants or vegetable waste. It is added as a fertilizer to enrich soil and help plants grow. Composting is a natural process to recycle organic matter, such as food scraps and dead leaves.

A compost bin converts food scraps into compost that can be used in your garden. Make your own compost bin using a recycled bottle.

Build your model using the steps below.

1. Your teacher will provide you with a plastic bottle with the top cut off.
2. Use a thumbtack to make small holes in the bottom of the bottle.
3. Put the bottle upright on a plastic tray or plate.
4. Place soil at the bottom.
5. Add dead plant scraps followed by a layer of soil.
6. Next add shredded paper and then a layer of soil.
7. Use a spray bottle to wet the bottom layers of the compost bin. Make sure it is not soaking wet, but reasonably moist.
8. Add a layer of fresher items, such as fruit or vegetable peel.
9. Place the bottle top upside-down in the bottle to create a funnel.



10. Place the compost bin on a tray. Keep it in a sunny location.
11. Cover the compost bin with a cloth.
12. Spray water into the compost bin every day for the next few weeks. After watering, mix the contents in the bottle. Close the top of the bottle and cover with a cloth again.
13. After a few weeks, the plant scraps and vegetable waste should have fully decomposed. The compost is ready for use.

Lesson 1 Impact of Human Activities on Earth's Systems

Key Terms

agriculture livestock industrialization
urbanization smog space debris

Recall

1. Explain the term *environment*.

2. Name any two natural disasters.

Engage

An Oily Mess

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1. Describe what you see in the picture above.
2. What could have caused this?
3. What happens if the crab rolled or burrowed in sand?

Explore

Simulating an Oil Spill in Water

In **Engage** on page 6, you learned about the effects of oil spills. Aquatic animals, such as crabs, can be covered in oil from an oil spill. What can the animal do to clean itself if it were covered with oil? Now, you will **Explore** ways to clean up oil that has spilled.

Work in pairs.

1. Put a few feathers and small plastic objects into a cup of water.
2. Simulate the oil spill by adding a tablespoon of oil to the water. What do you notice?

3. Remove the feathers and objects from the cup. Place them on a paper towel.

   What do you notice about the objects and feathers that you removed?

4. Use yarn or wool to create a barrier on the surface of the water. Try to collect all the oil in one place.

5. Now that the oil is collected in one place, how can you remove the oil from the water? Think of different methods and write them down.

6. Try to clean the plastic objects. First, try to clean them by only patting or wiping them down with a paper towel.

   Is this method effective in removing all the oil from the objects? Explain your answer.

7. Next, try removing the oil using soapy water. Is this method more effective in removing all the oil from the objects? Explain your answer.

8. Now, try to clean the feathers using the same methods for cleaning the objects. Using a scale of 1 to 5, where 1 means *very bad* and 5 means *very well*, rate how effective each cleaning method was.

	Method 1: Wiping or patting the feathers with a paper towel	**Method 2: Using soapy water to wash the feathers**
Rating		

9. From this experiment, what do you think the impact of oil spills is on animals that live in or feed from water that is contaminated?