Reading for Information

Settling in Space

Use with "All Summer in a Day," page 68.

What's the Connection?

In "All Summer in a Day," you read about people living in a colony on Venus. What is Venus *really* like? What would it be like to live in a space colony? Study the articles and images on the next few pages to get the science facts about Bradbury's science fiction setting.

Skill Focus: Synthesize Ideas Across Texts

READING 10D Synthesize and make logical connections across three texts representing different genres. **12B** Interpret factual, quantitative, and technical information presented in illustrations. **RC-6(E)** Synthesize texts in ways that maintain meaning and logical order across texts.

When you read several texts on the same topic, you naturally connect the ideas you find in each piece. You can then synthesize this information by putting it all together. Follow these steps to synthesize the ideas in the selections that follow:

1. **Find the Main Idea** The **main idea** is the most important point the writer makes about a topic. When you have to find the main idea of a piece of nonfiction, ask yourself, "What's the subject?" Sometimes the title tells you what the subject is. Now ask yourself, "What about it?" Your answer to that question is the main idea. Remember that a text may contain more than one main idea.
2. **Make Connections** Think about the relationships among the main ideas of all of the texts. In what ways are they connected? How are they different? How does one idea relate to or expand on another?
3. **Synthesize Ideas** To **synthesize** information means to take individual pieces of information and combine them in order to gain a better understanding of a topic.

Organize your ideas about each of the three selections in a chart like the one below.

Selection	Main Ideas	Supporting Details
"Weather That's Out of This World"	• Venus's weather is much worse than Earth's weather.	• The temperature on Venus can melt lead. • Acid rain constantly falls on Venus.
"Space Settlements"		

Weather That's Out of This World!

Alan Dyer Play Audio

If you think Earth's weather is wild, just wait until you see what it's like elsewhere in the solar system.

Hot, Sizzling Venus

"This is VTN—the Venus Television Network—with the latest forecast for the second planet from the Sun: hot today, hot tomorrow, and hot the following day. It will also be cloudy, with no sign of any sunshine. Take your glass umbrella—we're in for more acid rain."

If there were meteorologists on Venus, that's the kind of forecast they would have to give. Venus is a nasty place to live. Think of the hottest day you can remember. Then imagine what it would be like if it were 10 times hotter—that's what it's like on Venus.

Venus is the hottest planet in the solar system. The temperature at its surface is a searing 860 degrees Fahrenheit, day and night. The superhigh temperature surprised many astronomers, who once thought Mercury would be hotter, since it is closer to the Sun. But Venus has something very important that Mercury lacks—an atmosphere. Unlike Earth's atmosphere, which is made of oxygen and nitrogen, the air on Venus is mostly carbon dioxide gas, one of the so-called greenhouse gases. Like the glass in a greenhouse, carbon dioxide in the air traps heat coming from the Sun. With no place to go, the heat builds up. In the case of Venus, its thick carbon dioxide blanket has made the planet so hot that some metals, such as lead, would melt on its surface.

Adding to Venus's unpleasant weather is a constant drizzle from the thick clouds that surround the planet. But it's not water that falls from the sky there. Instead, the rain is made of droplets of sulfuric acid, a corrosive liquid that burns anything it touches. Between the blistering heat and the sizzling acid rain, Venus's weather is much worse than anything we could find on Earth. A

FOCUS ON FORM

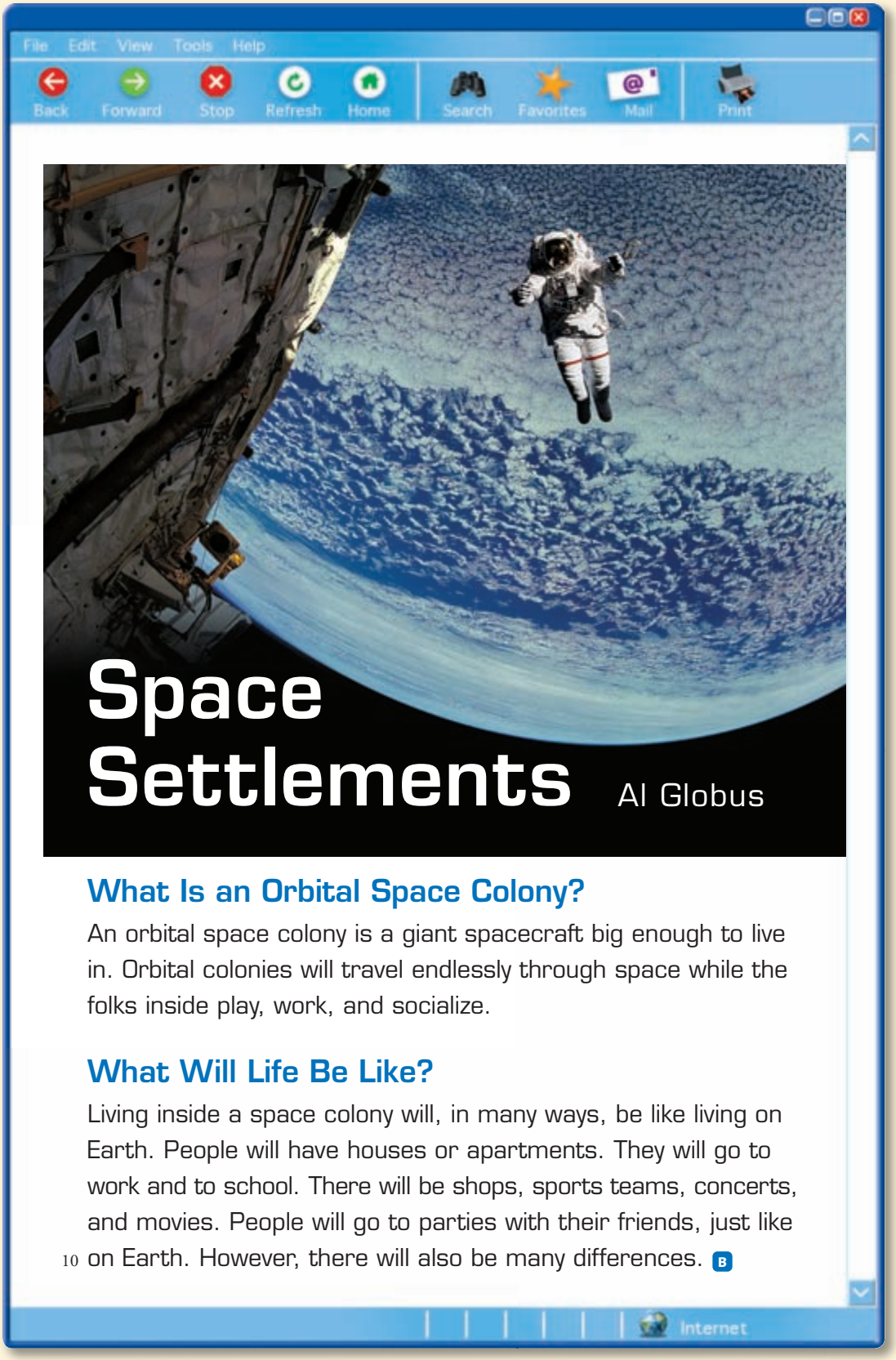
A **science article** is a short piece of nonfiction about a scientific subject. The author's purpose for writing a science article is usually to inform or explain. Science articles often use **text features,** like illustrations and bulleted lists, to help present information more clearly.

For more information about text features, see page R3 in the ***Reading Handbook.***

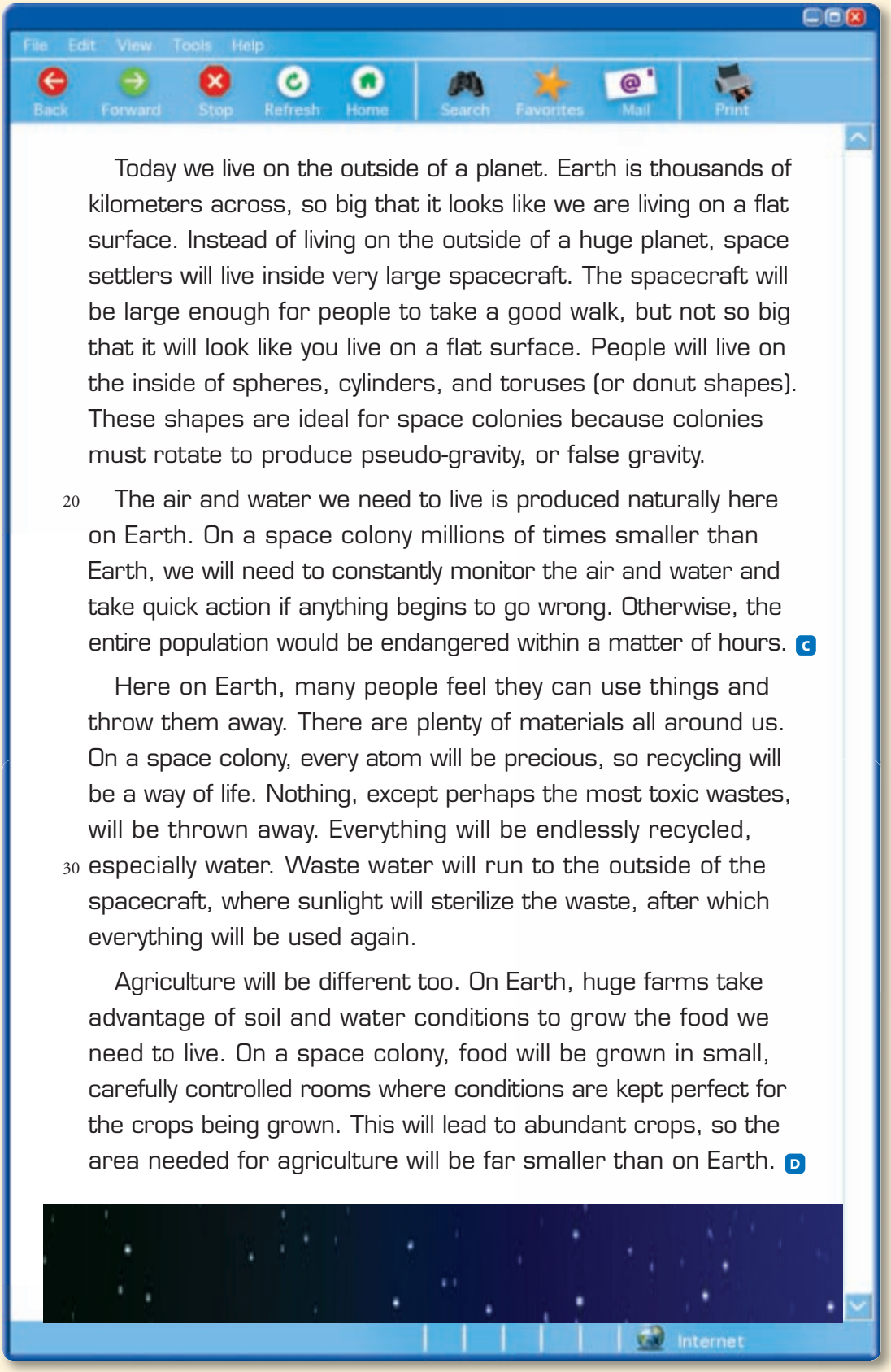
A FIND THE MAIN IDEA

State the **main idea** of this article. What details support the main idea? Add this information to your chart.

Play Audio



B SYNTHESIZE IDEAS ACROSS TEXTS
What is the topic of this online article? How might space colonies enable people to study Venus?



Today we live on the outside of a planet. Earth is thousands of kilometers across, so big that it looks like we are living on a flat surface. Instead of living on the outside of a huge planet, space settlers will live inside very large spacecraft. The spacecraft will be large enough for people to take a good walk, but not so big that it will look like you live on a flat surface. People will live on the inside of spheres, cylinders, and toruses (or donut shapes). These shapes are ideal for space colonies because colonies must rotate to produce pseudo-gravity, or false gravity.

The air and water we need to live is produced naturally here on Earth. On a space colony millions of times smaller than Earth, we will need to constantly monitor the air and water and take quick action if anything begins to go wrong. Otherwise, the entire population would be endangered within a matter of hours. C

Here on Earth, many people feel they can use things and throw them away. There are plenty of materials all around us. On a space colony, every atom will be precious, so recycling will be a way of life. Nothing, except perhaps the most toxic wastes, will be thrown away. Everything will be endlessly recycled, especially water. Waste water will run to the outside of the spacecraft, where sunlight will sterilize the waste, after which everything will be used again.

Agriculture will be different too. On Earth, huge farms take advantage of soil and water conditions to grow the food we need to live. On a space colony, food will be grown in small, carefully controlled rooms where conditions are kept perfect for the crops being grown. This will lead to abundant crops, so the area needed for agriculture will be far smaller than on Earth. D

C SYNTHESIZE IDEAS ACROSS TEXTS
What information about air and water quality on a space colony is provided in this paragraph? How does the quality of life in a space colony compare to the quality of life on Venus as described in the previous article? Add this information to your chart.

D SYNTHESIZE IDEAS ACROSS TEXTS
How will conditions for growing food enable people to survive in space?

E FIND THE MAIN IDEA
Reread lines 40–44. Then skim the bulleted items that follow. How does each support the main idea?

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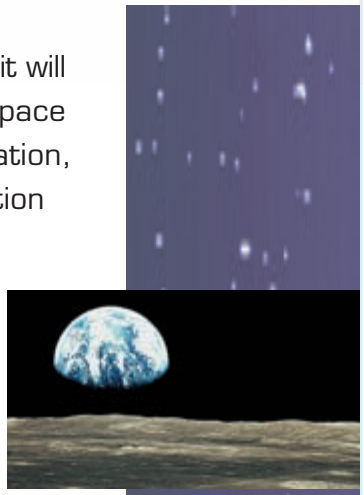
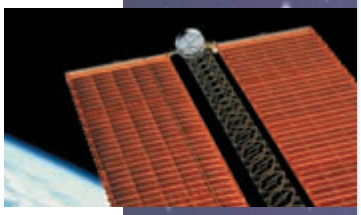
How Will We Build One?

No one has ever built a space colony, and it will be very difficult to do. Building cities in space will require materials, energy, transportation, communications, life support, and radiation protection. E



- **Materials** Launching materials from Earth is very expensive, so bulk materials will have to come from the Moon or asteroids and comets near Earth.

- **Energy** Solar energy is abundant and reliable. Massive structures will be needed to change sunlight into large amounts of electrical power for settlement use.



- **Transportation** Present launch costs are very high, ranging from $2,000 to $14,000 per pound. To settle space, much better launch vehicles would be needed to avoid serious damage to Earth's atmosphere from the thousands, perhaps millions, of launches required.

- **Communications** Compared to the other requirements, communication is relatively easy. Much of our current communications—cell phone signals, for example—already pass through satellites.

Internet

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- **Life Support** People will need air, water, food, and reasonable temperatures to survive. In space settlements, a relatively small, closed system must provide all of these to support life. F

- **Radiation Protection** Cosmic rays and solar flares create deadly radiation in space. To protect life, settlements must be shielded from most incoming radiation.

How Big Will the Colonies Be?

Since space colonies are for permanent living, not just a few months' work, they are expected to be about 100 times larger than today's space stations. Currently available materials could be used to build colonies that would be home to a population of ten or twenty thousand people. Designs even exist for colonies that would fit millions of people, but the first colonies will almost certainly be smaller.

Right now, space colonies are just an idea, but someday space colonies may crisscross the solar system, providing homes for a trillion people. What an achievement that will be. G

internet

TEKS 10D

F SYNTHESIZE IDEAS ACROSS TEXTS

To fully understand a topic like space exploration, you need to **synthesize,** or combine facts, details, and ideas from different sources. When you synthesize this information, you will be able to form new ideas about the topic. Recall what you learned about Venus's weather in "Weather That's Out of This World" (page 79). How does that information add to your understanding of the necessity of the life support described in lines 69–74?

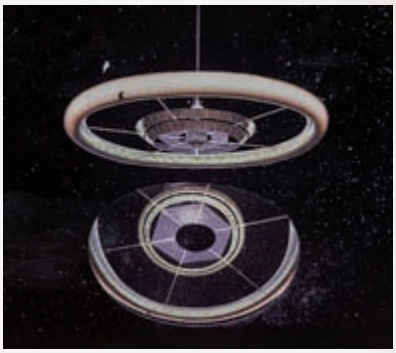
G SYNTHESIZE IDEAS ACROSS TEXTS

How did the information from this online article improve your understanding of living in space? Why is it more likely that people would live in space colonies rather than try to settle on the surface of planets like Venus?

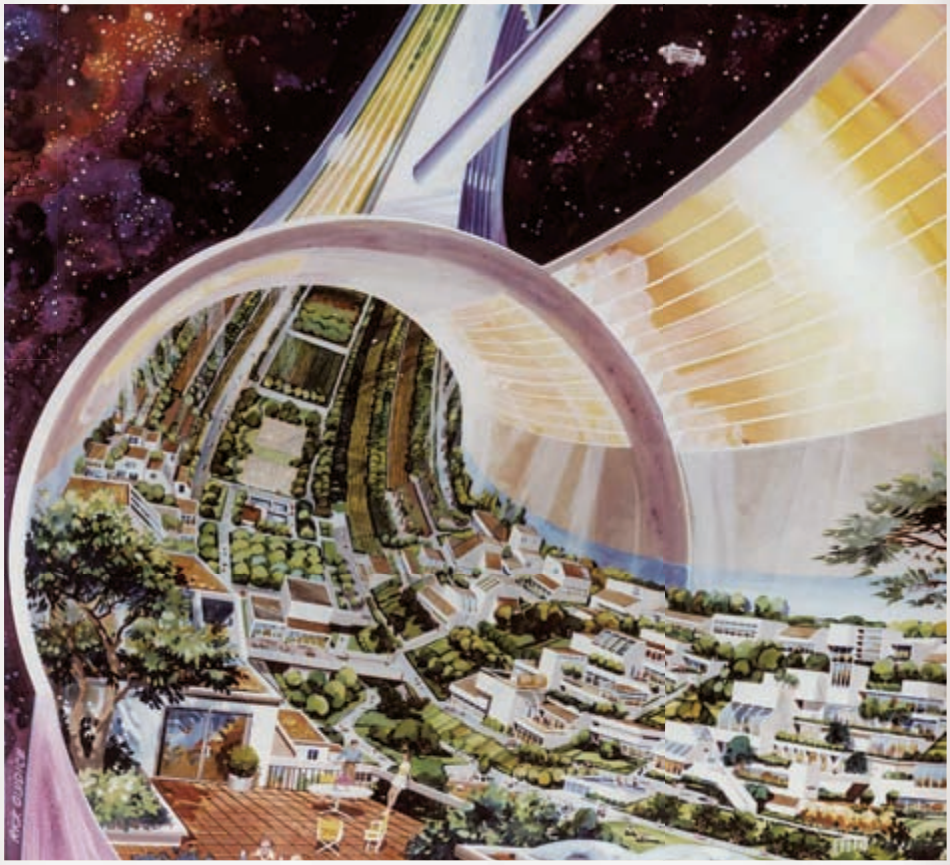
ARTISTS' VIEWS OF A

SPACE COLONY

As scientists explore the possibilities of how to colonize space, many of the concepts they present to the public can be difficult to visualize. For that reason, artists often work with scientists to help convey their ideas. Here, artists have illustrated inside and outside views of a possible space colony.



Exterior view of a space colony H



Interior view of a space colony

TEKS 12B

H SCIENCE ARTICLE

In an informational text, the visual elements on the page are deliberately instructive. In scientific articles, an artist's illustrations provide supporting and clarifying information. How do these illustrations add to your understanding of living in a space colony?

Comprehension

1. **Recall** What do you learn about Venus from the Venus Television Network "broadcast"?
2. **Summarize** Briefly describe the main features of the orbital space colony shown in the two illustrations on page 84.

Critical Analysis

3. **Find the Main Idea** Name three ways that life on a space colony would differ from life on Earth, according to "Space Settlements."
4. **Analyze Characteristics of Form** What are three characteristics of "Space Settlements" that make it a **science article?** Explain.
5. **Synthesize Ideas Across Texts** Consider what you know of neighborhoods on Earth and what you learned about orbital space colonies in the articles you read. Do you think the illustrations of an orbital space colony are realistic? Why or why not?

READING 10D Synthesize and make logical connections across three texts representing different genres. **12B** Interpret factual, quantitative, and technical information presented in illustrations. **RC-6(E)** Synthesize texts in ways that maintain meaning and logical order across texts.

Read for Information: Synthesize Ideas Across Texts

WRITING PROMPT

The three texts you just read provide different ideas about living in space. In a paragraph, explain what you learned about living in space. Consider the facts in "Weather That's Out of This World!" and the facts in "Space Settlements." Think about how the illustrations in "Artists' Views of a Space Colony" added to your understanding. Finally, use the chart you created as you read to **synthesize,** or combine, what you learned into a paragraph.

To answer this prompt, follow these steps:

1. Review the chart you created as you read each selection.
2. Make sure the information in the chart represents the main ideas in each selection and includes details that support each selection's main idea.
3. Make connections between the texts by drawing lines on your chart to link ideas that appear in more than one text.
4. Write a paragraph in which you sum up what you've learned about living in space.