



# Constellations

[www.sciencea-z.com](http://www.sciencea-z.com)

## Constellations

*A Science A-Z Picture Book*

When Each Constellation Is Visible in the Northern Hemisphere	
Winter	Orion, Gemini, Taurus, Ursa Minor
Spring	Leo, Virgo, Ursa Minor
Summer	Scorpius, Sagittarius, Cygnus, Ursa Minor
Autumn	Pegasus, Pisces, Ursa Minor

# Constellations



**Photo Credits:**

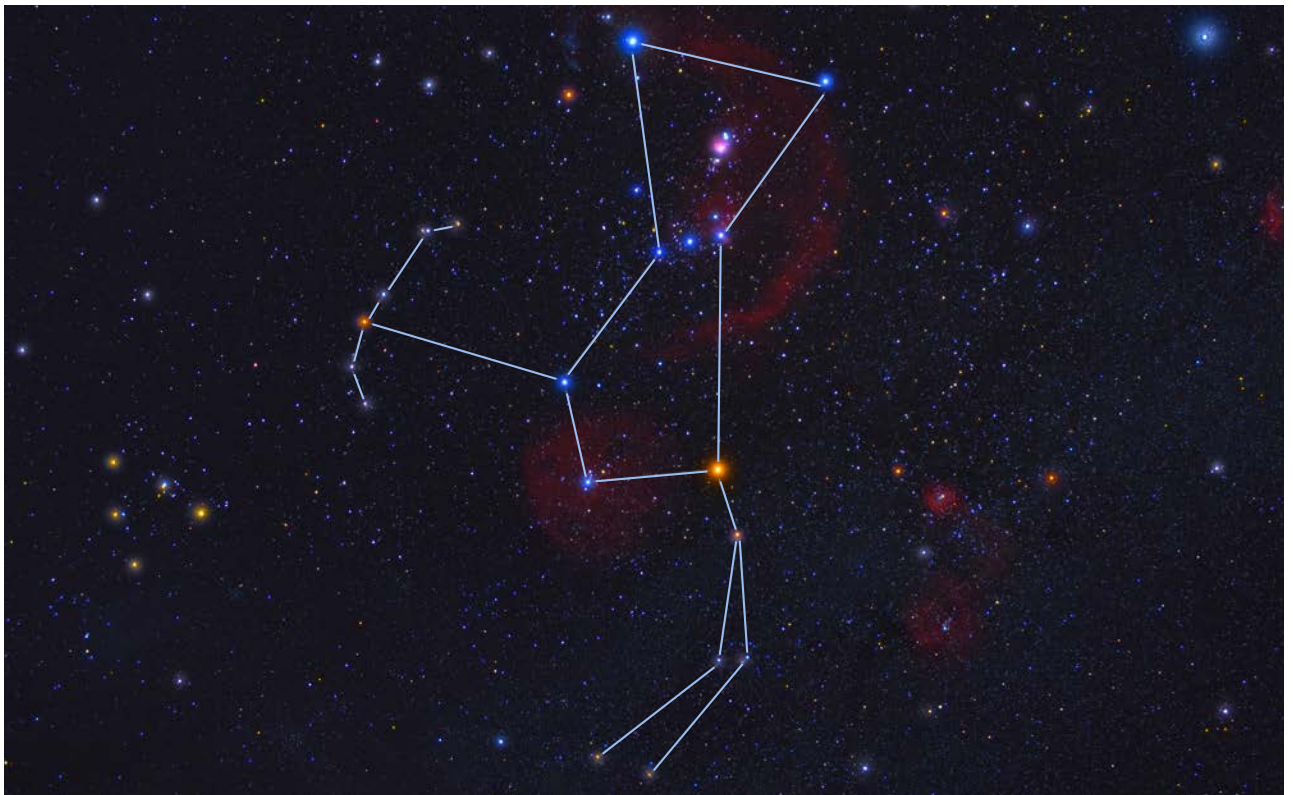
Front cover: © iStock.com/Rastan; title page: © Martin Dohrn/NPL/Minden Pictures; pages 2, 3, 4, 5, 6, 10, 11, 12: © Gerard Lodriguss/Science Source; pages 7, 8, 9: © Larry Landolfi/Science Source

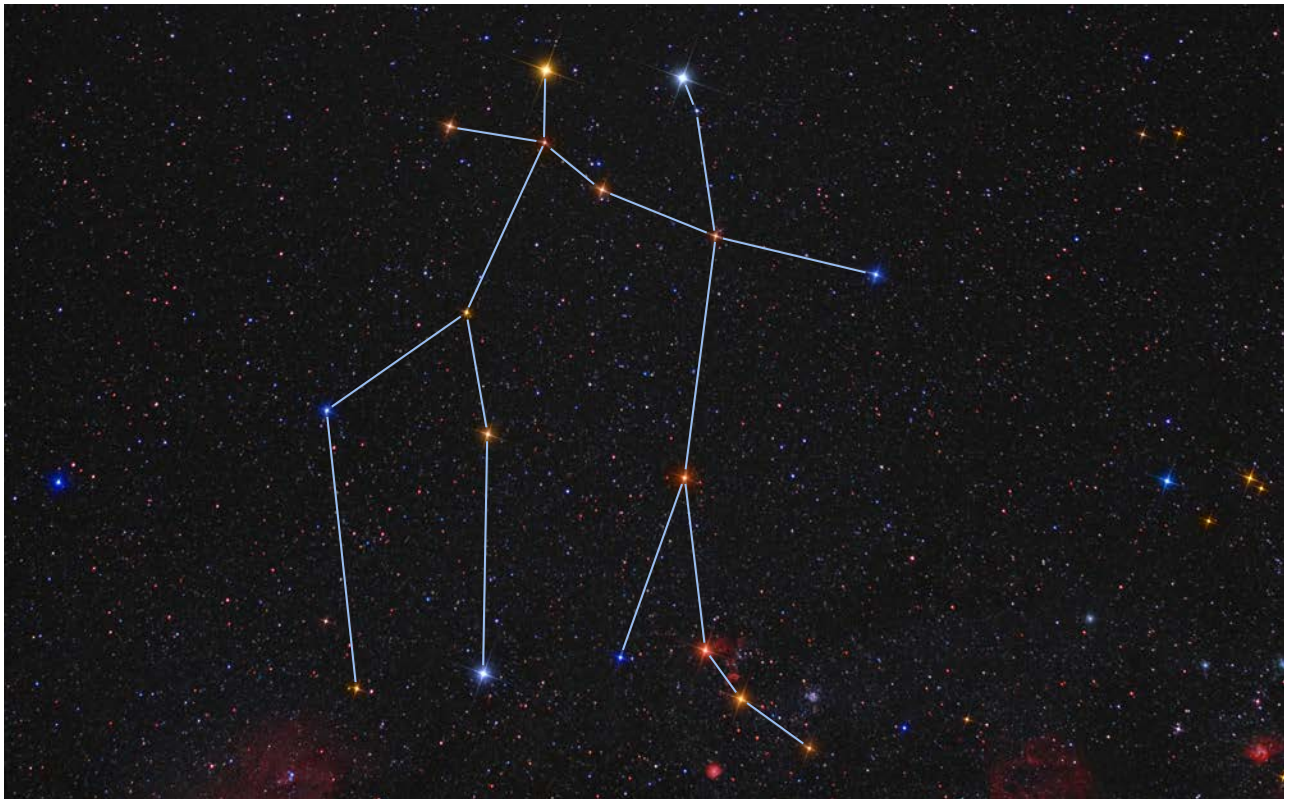
Constellations  
© Learning A-Z

All rights reserved.

[www.sciencea-z.com](http://www.sciencea-z.com)

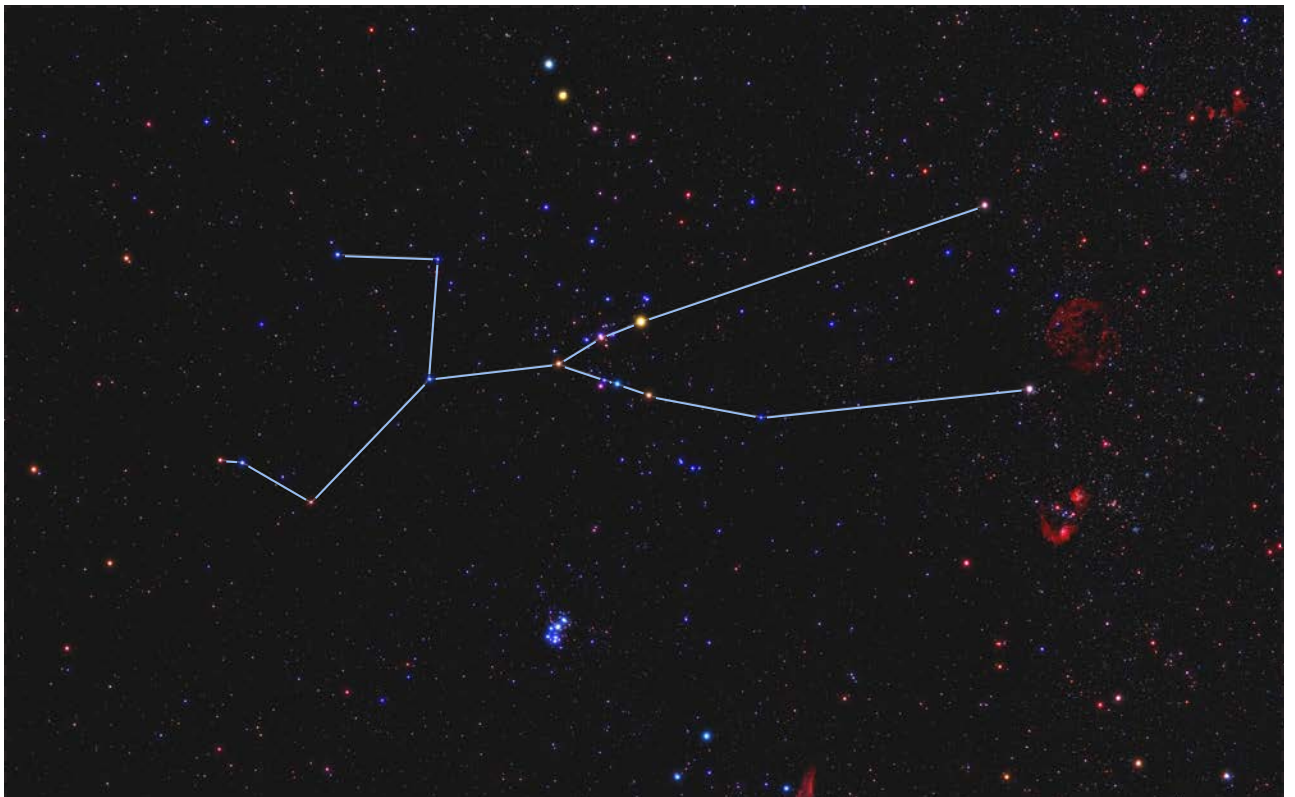
Orion is visible in the night sky during winter in the Northern Hemisphere.

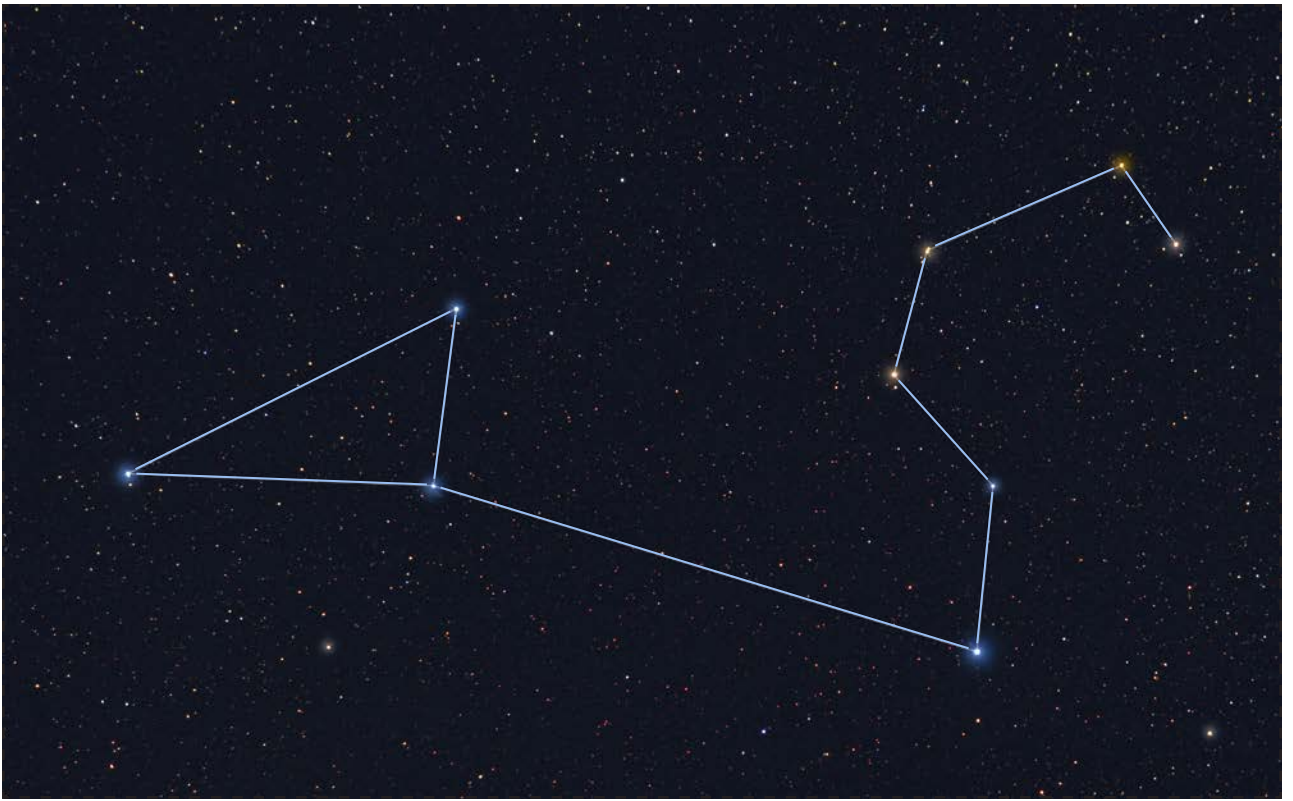




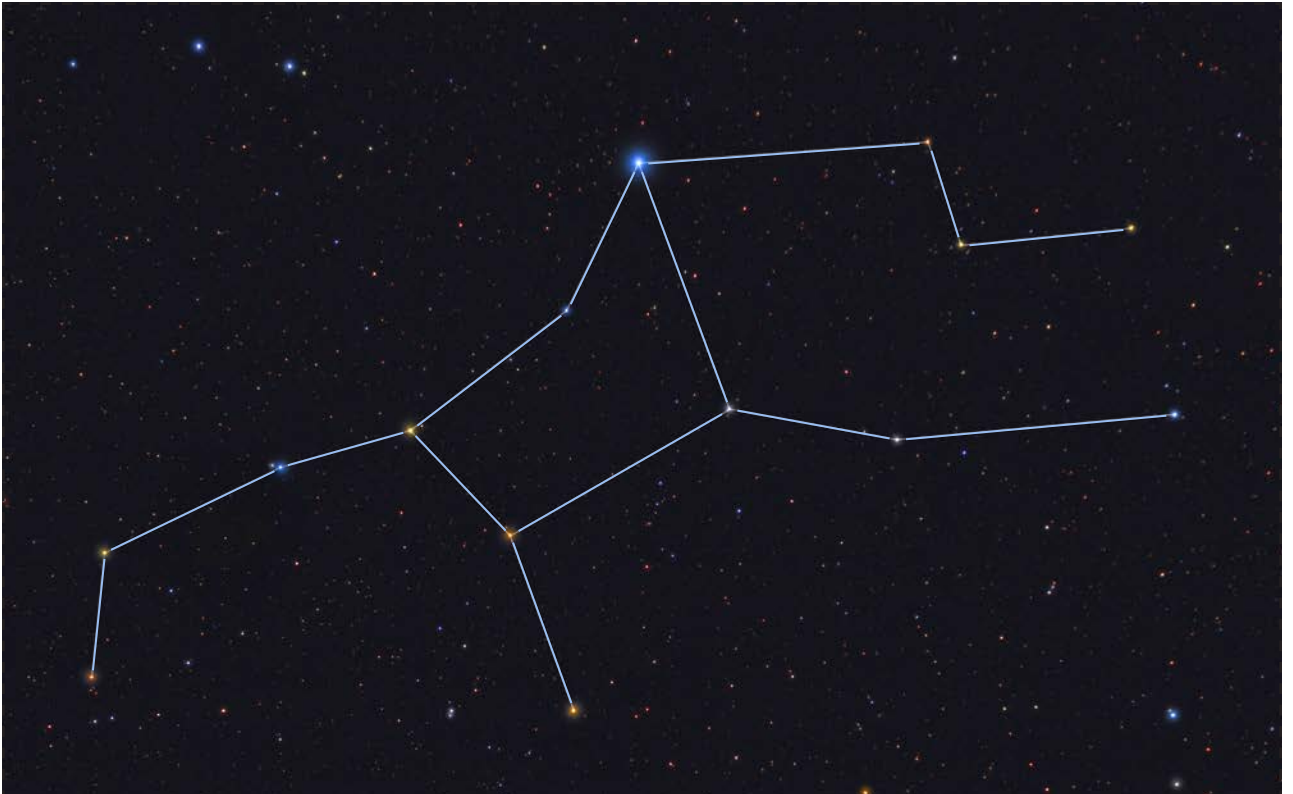
Gemini is visible in the night sky during winter in the Northern Hemisphere.

Taurus is visible in the night sky during late winter/early spring in the Northern Hemisphere.

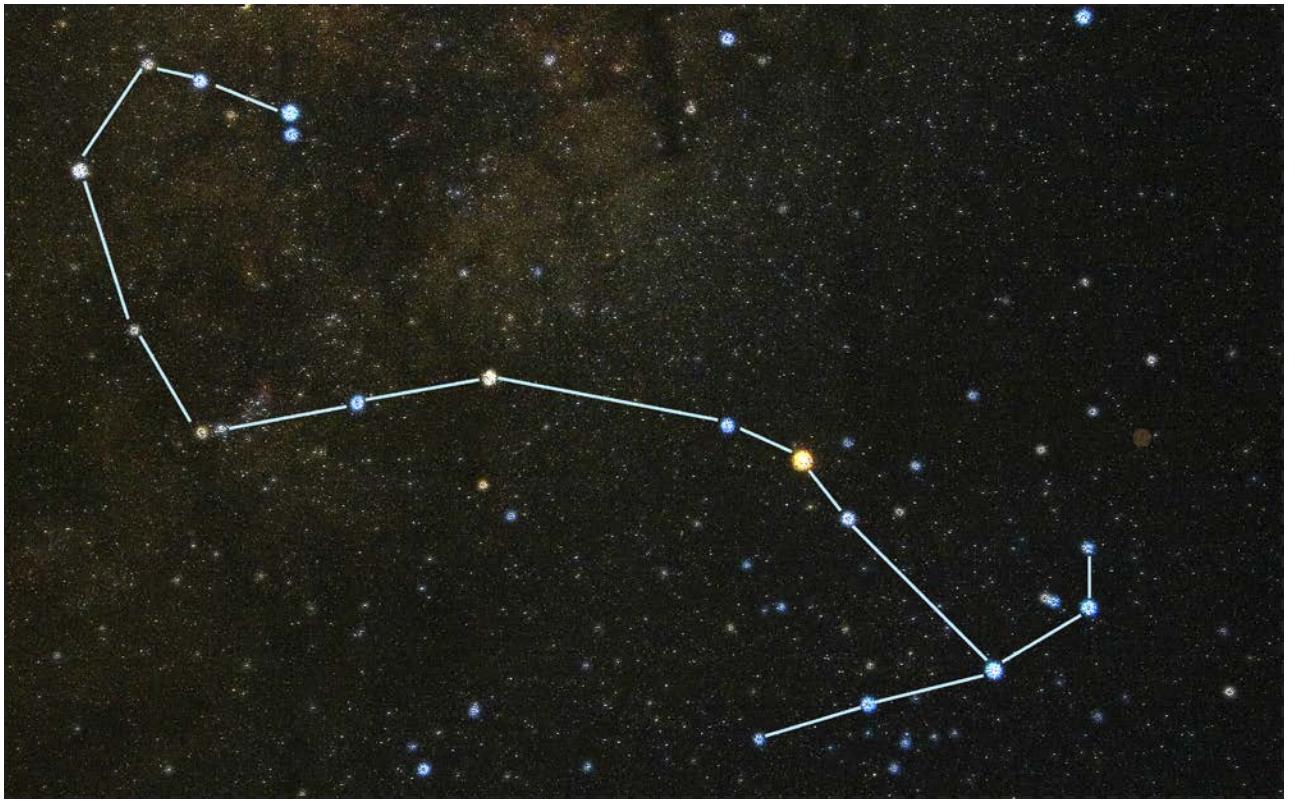




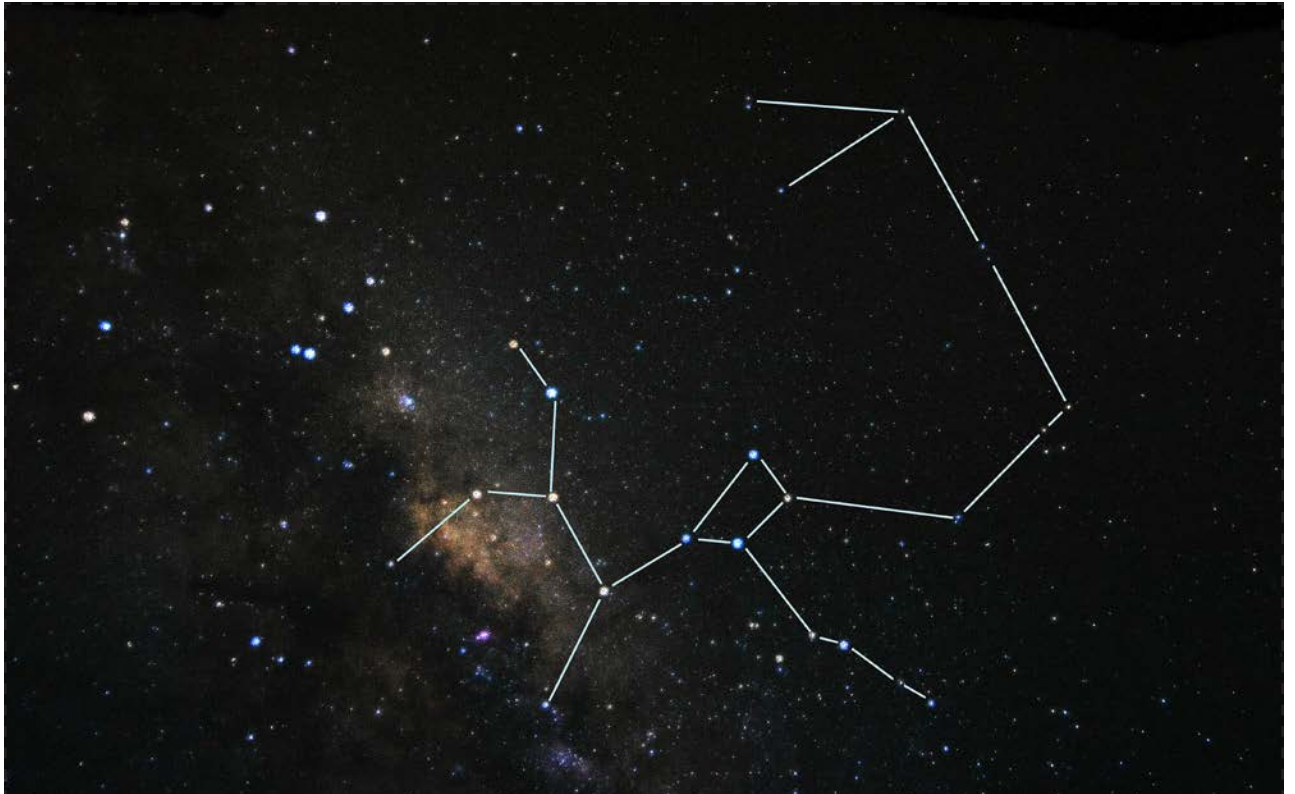
Leo is visible in the night sky during spring in the Northern Hemisphere.



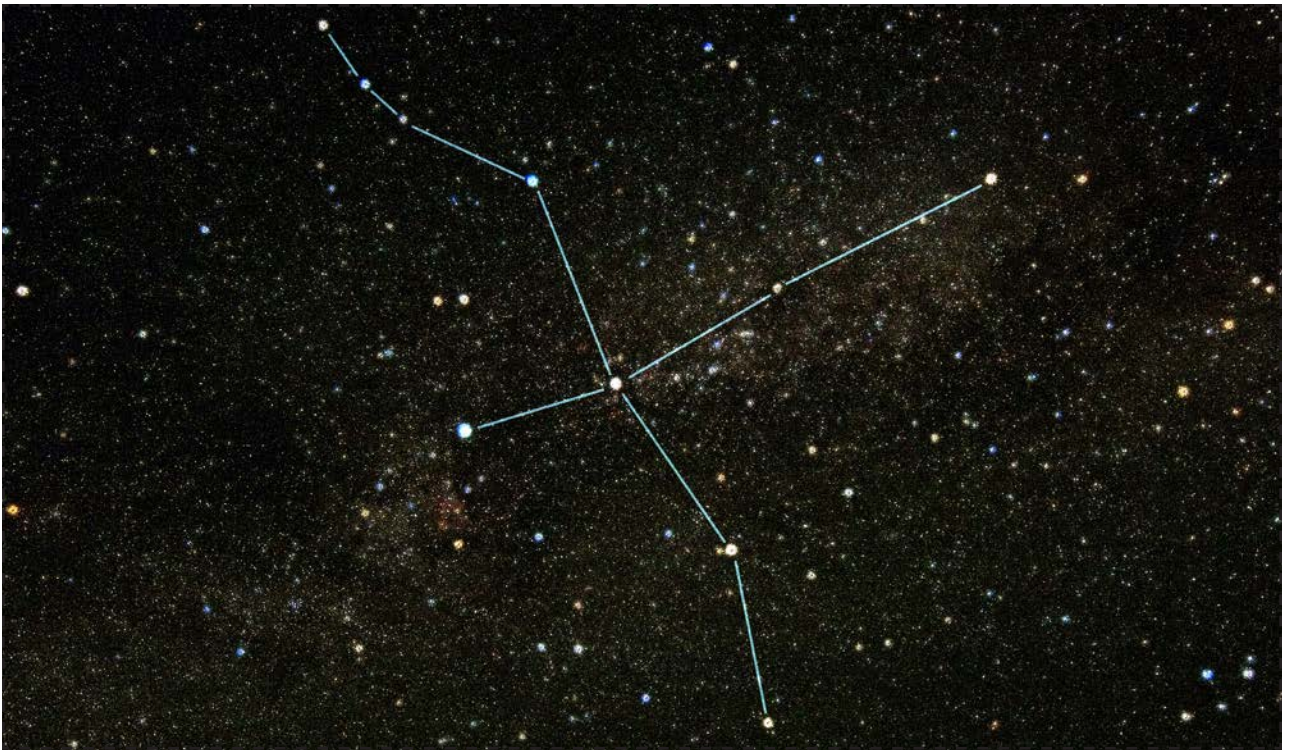
Virgo is visible in the night sky during spring in the Northern Hemisphere.



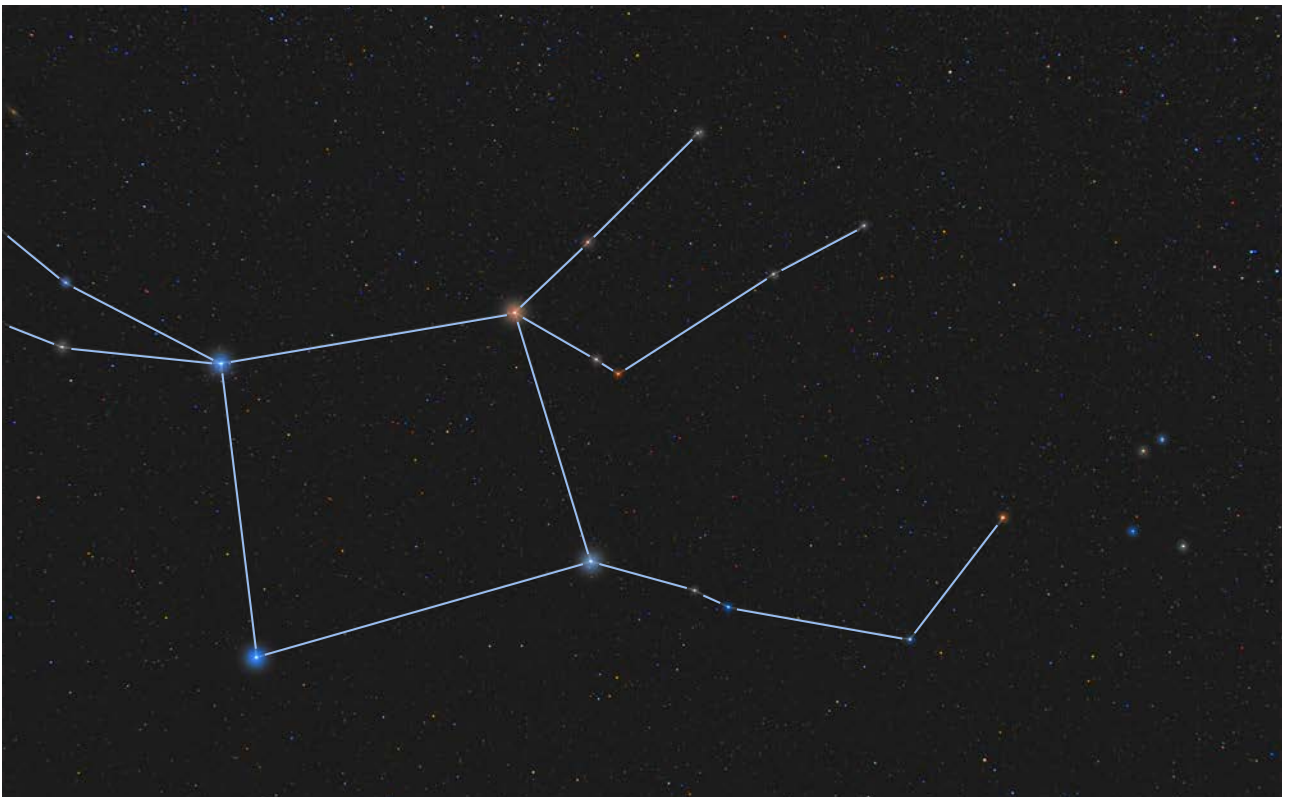
Scorpius is visible in the night sky during summer in the Northern Hemisphere.



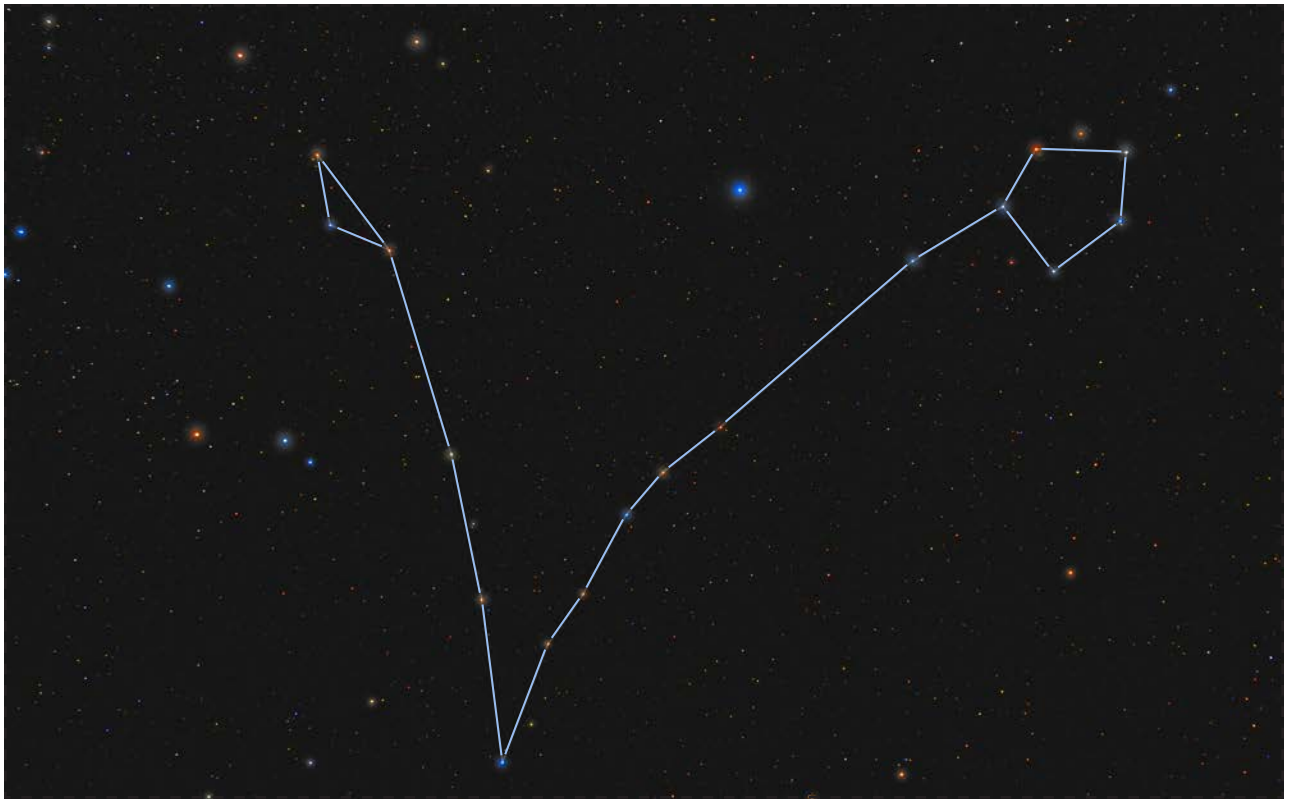
Sagittarius is visible in the night sky during summer in the Northern Hemisphere.



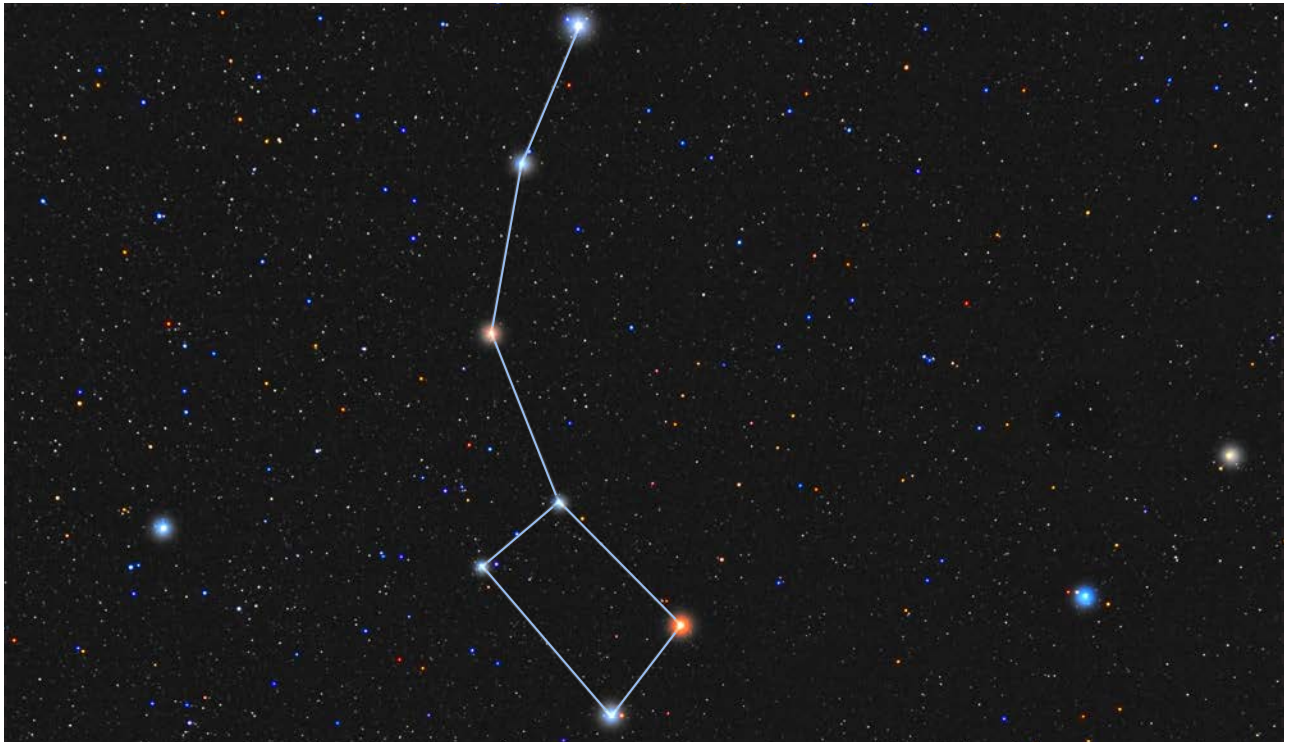
Cygnus is visible in the night sky during late summer/early autumn in the Northern Hemisphere.



Pegasus is visible in the night sky during autumn in the Northern Hemisphere.



Pisces is visible in the night sky during autumn in the Northern Hemisphere.



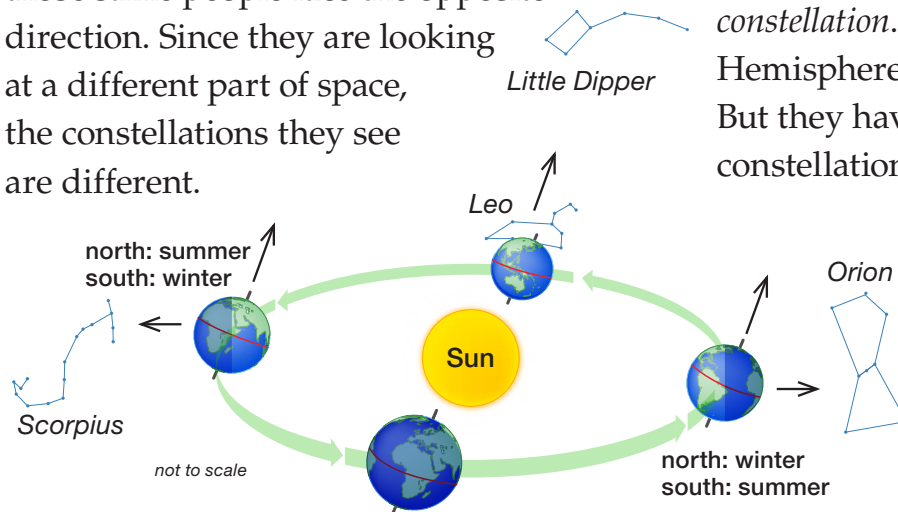
The Little Dipper (Ursa Minor) is visible in the night sky all year long in the Northern Hemisphere.

# Seasonal and Circumpolar Constellations

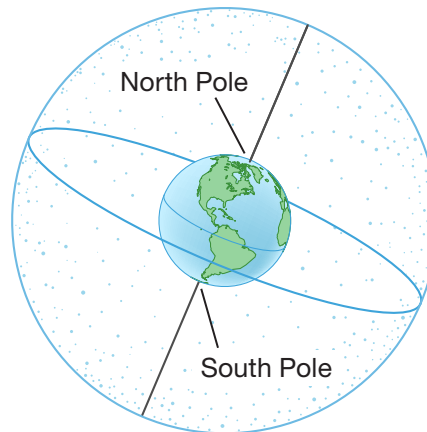
Step outside on a clear night and you'll likely see a beautiful sight—countless twinkling stars. If you connect the dots, you might imagine shapes called *constellations*. The constellations you see depend on where you live and the season.

People near the North Pole can see the constellations that are to the north of Earth in space. People near the South Pole can see the constellations that are to the south. People who live in between can see some of both, depending on how close they are to the equator.

But Earth doesn't sit still. As it orbits the Sun, the constellations that are visible change throughout the year. Some *seasonal constellations* disappear from view, while others become visible. On a summer night, people in a certain location on Earth face one direction in space. On a winter night, those same people face the opposite direction. Since they are looking at a different part of space, the constellations they see are different.



Scorpius, Leo, and Orion are seasonal constellations. But people in the Northern Hemisphere can see the Little Dipper (Ursa Minor) all year.



From Earth, it appears as if the planet is surrounded by a *celestial sphere* of stars. In reality, the stars are at very different distances from Earth.

## Do You Know?

The constellations are still there during the day. You just can't see them because the Sun is so bright.

The Little Dipper is a constellation directly north of Earth's axis. Because of its position, people in the Northern Hemisphere can see the Little Dipper throughout the year. The dipper appears to move in a circle around the sky as Earth orbits the Sun, so it is a *circumpolar constellation*. People in the Southern Hemisphere cannot see the Little Dipper. But they have a few circumpolar constellations of their own.

## Brain Check

- What is a seasonal constellation?
- What is a circumpolar constellation?
- Why is the Little Dipper only visible in the Northern Hemisphere?

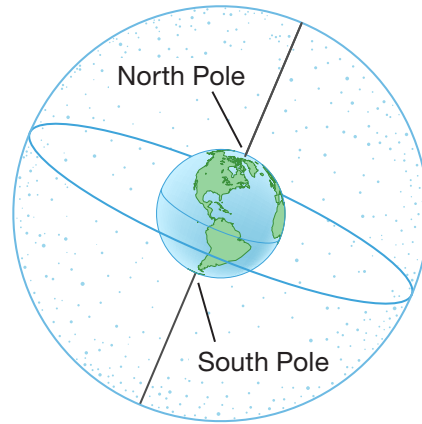


# Seasonal and Circumpolar Constellations

Step outside on a clear night and you'll see a sky full of twinkling stars. If you connect the dots, you might imagine shapes. These shapes are called *constellations*. The constellations you see depend on where you live and the season.

People near the North Pole can see the constellations that are to the north of Earth in space. People near the South Pole can see the constellations that are to the south. People who live in between can see some of both, depending on how close they are to the equator.

But Earth doesn't sit still. It orbits the Sun. As it moves, the constellations that are visible change. People can see the *seasonal constellations* during certain seasons. On a summer night, people on Earth are looking out toward one direction in space. On a winter night, those same people are looking at a different part of space. Therefore, they see different constellations.

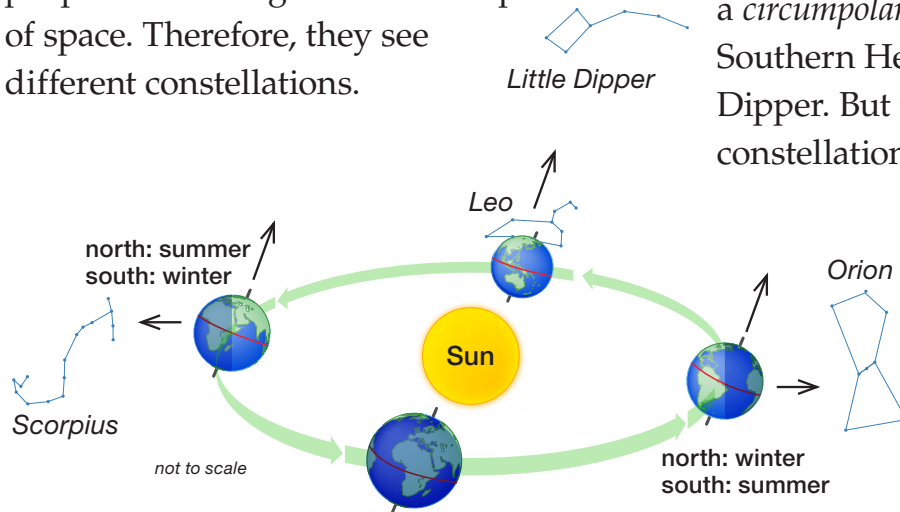


From Earth, it appears as if the planet is surrounded by a *celestial sphere* of stars. In reality, the stars are at very different distances from Earth.

## Do You Know?

The constellations are still there during the day. You just can't see them because the Sun is so bright.

People in the Northern Hemisphere can see the Little Dipper all year long. That's because this constellation is directly north of Earth's axis. As Earth orbits the Sun, the dipper appears to move in a circle around the sky. For this reason, it is called a *circumpolar constellation*. People in the Southern Hemisphere can't see the Little Dipper. But they have a few circumpolar constellations of their own.



## Brain Check

- What is a seasonal constellation?
- What is a circumpolar constellation?
- Why is the Little Dipper only visible in the Northern Hemisphere?

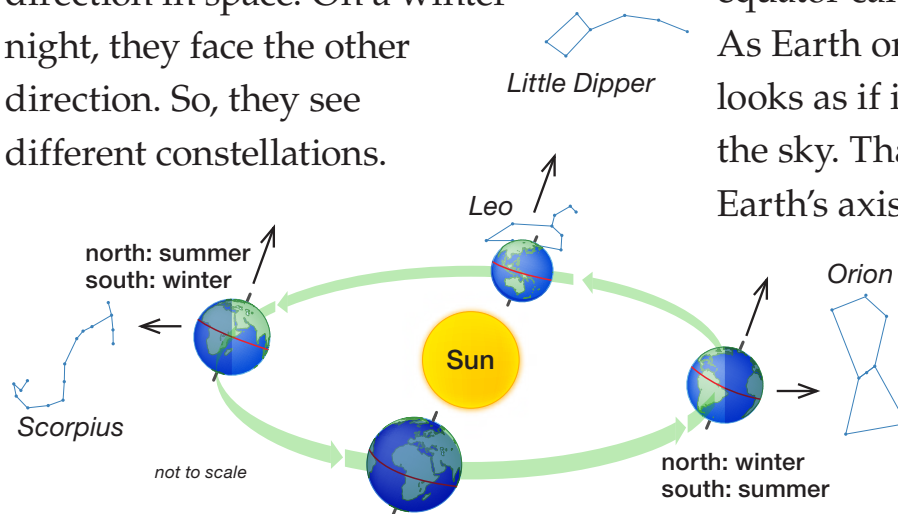
Scorpius, Leo, and Orion are seasonal constellations. But people in the Northern Hemisphere can see the Little Dipper (Ursa Minor) all year.

# Seasonal and Circumpolar Constellations

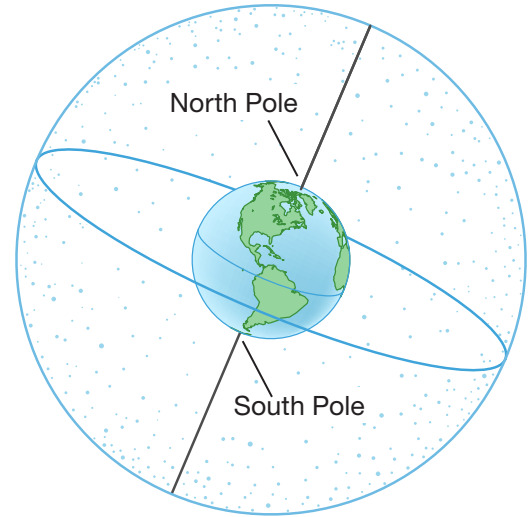
Look up at the sky on a clear night. It is full of stars! You might even picture shapes made by the stars. These shapes are called *constellations*. The constellations you can see depend on where you live. They also depend on the season.

People near the North Pole can see the constellations that are to the north of Earth. People near the South Pole can see the ones that are to the south. People who live in between can see some of both. It depends on how close they are to the equator.

But Earth doesn't sit still. It orbits the Sun. As it moves, the seasons change. The constellations that people can see change, too. At nighttime during the summer, people on Earth face one direction in space. On a winter night, they face the other direction. So, they see different constellations.



Scorpius, Leo, and Orion are *seasonal* constellations. The Little Dipper (Ursa Minor) is a *circumpolar* constellation.



From Earth, all the stars seem to surround Earth like a big ball. But some of the stars are closer to Earth, while others are much farther away.

## Do You Know?

The constellations are still there during the day. You just can't see them because the Sun is so bright.

People can see some constellations all year long. People who live north of the equator can always see the Little Dipper. As Earth orbits the Sun, the dipper looks as if it moves in a circle around the sky. That's because it is north of Earth's axis.

## Brain Check

- Why are some constellations only visible during a certain season?
- Why are some constellations visible all the time?

Name \_\_\_\_\_ Date \_\_\_\_\_

### Part 1: Analyze the Data

Read the tables and then use the information to answer the questions.

Constellations Visible in the Northern Hemisphere	
Winter	Orion, Gemini, Taurus
Spring	Leo, Virgo
Summer	Scorpius, Sagittarius, Cygnus
Autumn	Pegasus, Pisces
All Year	Little Dipper

Constellations Visible in the Southern Hemisphere	
Winter	Lyra, Scorpius, Cygnus
Spring	Andromeda, Pegasus
Summer	Dorado, Orion, Taurus
Autumn	Hydra, Leo
All Year	Southern Cross

- When and where is Taurus visible? \_\_\_\_\_  
\_\_\_\_\_
- Is Taurus a *seasonal* or *circumpolar* constellation? How can you tell? \_\_\_\_\_  
\_\_\_\_\_
- When and where is the Southern Cross visible? \_\_\_\_\_  
\_\_\_\_\_
- Is the Southern Cross a *seasonal* or *circumpolar* constellation? How can you tell? \_\_\_\_\_  
\_\_\_\_\_
- Which circumpolar constellation is visible in the Northern Hemisphere? \_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_

**Part 2: Use the Diagram**

Using the tables in Part 1, write the name of each constellation in the correct position on the diagram. Use all the constellations from both tables, but write each constellation only once. Then answer the questions.

north: all year  
south: never

\_\_\_\_\_

north: spring  
south: autumn

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

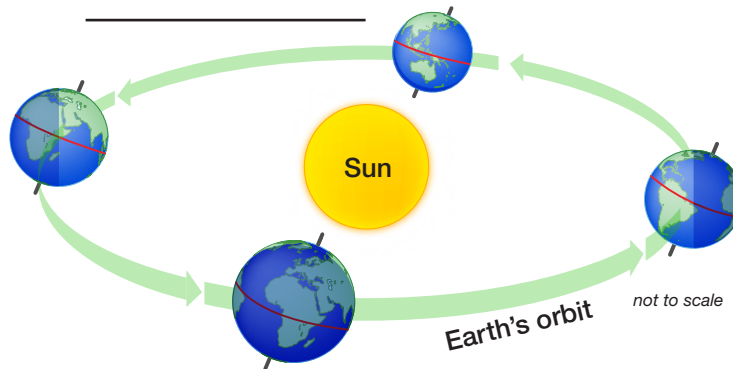
north: summer  
south: winter

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



north: winter  
south: summer

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

north: autumn  
south: spring

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

north: never  
south: all year

\_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_

1. Why is Scorpius visible during summer in the Northern Hemisphere but visible during winter in the Southern Hemisphere? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

2. Using the diagram, describe one *pattern* about the seasonal appearance of constellations.

\_\_\_\_\_  
\_\_\_\_\_

3. What is the relationship between Earth's position around the Sun and the constellations that are visible at night? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

4. How would the constellations people can see at night be different if Earth stayed in one place instead of orbiting the Sun? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## ANSWER KEY AND TEACHING TIPS

### Connections to the Next Generation Science Standards\*

#### **Target Science and Engineering Practice:** *Analyzing and Interpreting Data*

- Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.

**Associated Performance Expectation:** *5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.*

All questions in this assessment relate to the Disciplinary Core Ideas **DCI** of this Performance Expectation. Look for the **SEP** and **CCC** symbols for questions that specifically address Science and Engineering Practices and Crosscutting Concepts.

### Summary

Students analyze data from tables, complete a diagram, and answer questions to demonstrate their knowledge of the relationship between the constellations that are visible in the night sky and the position of Earth during its orbit around the Sun.

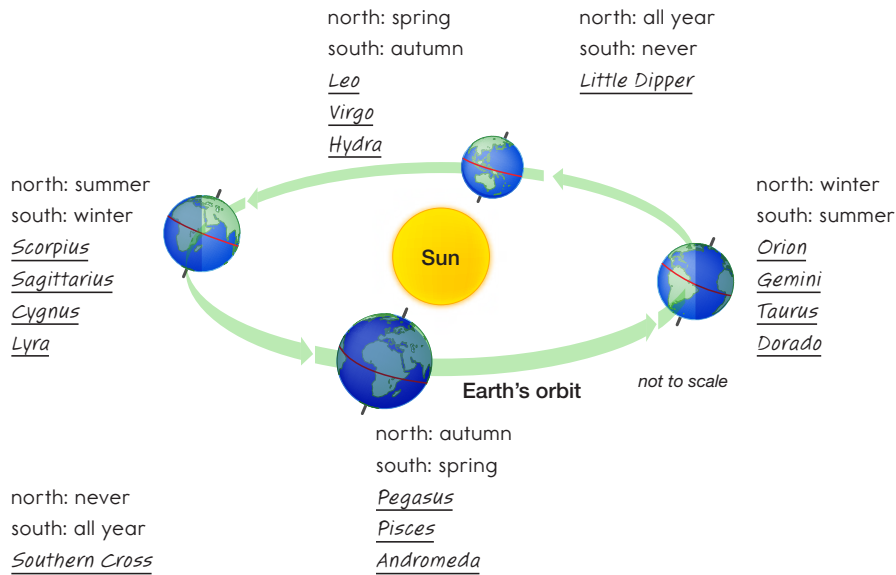
### **Part 1: Analyze the Data**

1. *Taurus is visible during winter in the Northern Hemisphere and during summer in the Southern Hemisphere.*
2. *Taurus is a seasonal constellation because it is only visible during a specific season.*
3. *The Southern Cross is visible all year in the Southern Hemisphere. It is never visible in the Northern Hemisphere.*
4. *The Southern Cross is a circumpolar constellation because it is visible throughout the year.*
5. *the Little Dipper*

### **SEP** Part 2: Use the Diagram

*Students should list all the correct seasonal constellations in each of the four positions around Earth's orbit of the Sun. Note that within each group, certain constellations are visible from both hemispheres, while others are only visible from one hemisphere or the other. The northern and southern circumpolar constellations should be written on the appropriate single lines.*

\* Next Generation Science Standards is a registered trademark of Achieve. Neither Achieve nor the lead states and partners that developed the Next Generation Science Standards was involved in the production of, and does not endorse, this product.



1. *Scorpius is visible when the nighttime (dark) side of Earth is facing it. This occurs during summer in the Northern Hemisphere and during winter in the Southern Hemisphere, which happen at the same time of year.*
- ccc 2. *Student answers will vary, depending on which pattern they choose to write about. Examples include that the four seasons repeat year after year as Earth orbits the Sun, the seasonal constellations appear during the same season each year, and some constellations are visible to people in the Northern and Southern Hemispheres during opposite seasons.*
3. *As Earth travels around the Sun, the nighttime side of Earth faces a different part of outer space. Because of this, different constellations are visible, depending on the time of year. But certain constellations can be seen all year long in some places because they are above the North Pole or below the South Pole.*
4. *If Earth stayed still instead of orbiting the Sun, we would always see the same constellations. The nighttime side of Earth would always be facing the same part of space.*

**Teaching Tips**

If students have trouble performing the tasks on this assessment, have them explore the working models they created during Lesson 5. Remind students that during the daytime, the Sun's light blocks our view of other stars, so we can only see constellations when they are on the nighttime side of Earth. Demonstrate with one of the models to show students that as Earth moves around the Sun, the nighttime side of Earth faces different constellations in space. This is why many constellations are seasonal. The seasonal appearance of many constellations is a pattern that repeats each time Earth orbits the Sun. Other constellations are circumpolar, so they are visible all year long to people in one of the hemispheres. Use the model again to help students visualize why people in the Northern Hemisphere can see the Little Dipper at night all year long (it is always "above" the North Pole), and do the same with the Southern Cross in the Southern Hemisphere.

**Extensions**

For students who complete their work early or are ready for an extra challenge, assign additional resources related to this topic found on the [Grade 5 Space Systems NGSS page](#) on Science A-Z.