Overview
The Solar System and Beyond

Directions: Complete the concept map using the terms in the list below.

240 million years | Earth | 27.3 days | Moon
Sun | 365 days | Milky Way galaxy

The 1. ______________ takes about
2. ______________
to revolve around

3. ______________ which takes about
4. ______________
to revolve around

the 5. ______________ which takes about
6. ______________
to revolve around

the center of the
7. ______________
Section 1  Earth’s Place in Space

Directions: Use the illustration below to identify the phases of the Moon as new, waxing, full, or waning. Write the correct phase on the lines provided.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

Directions: Answer the following questions on the lines provided.

9. How long does it take the Moon to revolve around Earth?

10. What is the spinning of Earth on its axis called?

11. What season is it when your part of Earth is tilted away from the Sun?

12. Place the Moon and Earth in the spaces below as they would line up during a solar and a lunar eclipse.
   a. Solar eclipse  SUN → __________________ → __________________
   b. Lunar eclipse  SUN → __________________ → __________________
Directions: Identify and describe each type of galaxy below.

1. Type: ____________________________
   Description: ____________________________

2. Type: ____________________________
   Description: ____________________________

3. Type: ____________________________
   Description: ____________________________

Directions: Complete the following sentences using the correct terms.

4. Our ______________________ is made up of the nine planets and other objects that orbit the Sun.

5. The ______________________ is at the center of our solar system.

6. A(n) ______________________ is a group of stars, gas, and dust held together by gravity.

7. Our solar system is in the ______________________ galaxy.

8. The Milky Way is a ______________________ galaxy.

9. The distances between the planets are measured in ______________________.
Directions: Complete the following sentences using the terms listed below.

astronomical unit  comet  light-year  constellations
meteorites  revolution  supernova  eclipse
rotation  solar system  orbit

1. The spinning of Earth on its axis is called ____________________.
2. It takes a year for Earth to make one ____________________ around the Sun.
3. When the moon blocks all or part of the Sun, it is called a
   solar ____________________.
4. A(n) ____________________ is equal to 150 million km and is used to measure long distances.
5. Our ____________________ is made up of nine planets and numerous other objects that orbit the Sun.
6. Groups of stars that form patterns in our sky are ____________________.
7. A(n) ____________________ is the distance light travels in a year—about 9.5 trillion km.
8. Earth moves around the Sun in a regular, curved path called a(n) ____________________.
9. After a(n) ____________________ occurs, for a few days it might shine more brightly than a whole galaxy.
10. A large body of frozen ice and rock that travels toward the center of the solar system is a(n) ____________________.
11. Chunks of rock and metal from space that fall to Earth are known as ____________________.
### Earth’s Place in Space

**Directions:** Match the cause in Column I with its effect in Column II by writing the correct letter in the space provided.

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. revolution of Earth around the Sun</td>
<td>a. night and day</td>
</tr>
<tr>
<td>2. rotation of Earth</td>
<td>b. eclipses</td>
</tr>
<tr>
<td>3. tilt of Earth’s axis</td>
<td>c. Moon phases</td>
</tr>
<tr>
<td>4. position of Earth, the Sun, and the Moon</td>
<td>d. seasons</td>
</tr>
<tr>
<td>5. new moon and half moon</td>
<td>e. years</td>
</tr>
</tbody>
</table>

**Directions:** For each cause-and-effect pair that you matched above, write one or two complete sentences explaining the relationship. The first one is done for you.

6. It takes one year for Earth to revolve all the way around the Sun.

7. 

8. 

9. 

10. 

The Solar System

Directions: Use the clues below to complete the crossword puzzle.

Across
3. These pieces of rock form a belt that separates the inner planets from the outer planets.
4. Pluto is the ________ planet in size.
6. Saturn is known for its dazzling ________.
8. Jupiter, Saturn, Uranus, Neptune, and Pluto make up the ________ planets.
9. This force holds the objects in the solar system in place.
10. This is the number of planets that are in our solar system.
11. Earth is the ________ planet from the Sun.
13. A piece of rock or metal that plunges through the atmosphere and falls to Earth is called a(n) ________.

Down
1. This is made up of the nine planets and numerous other objects that orbit the Sun.
2. This large body of frozen ice and rock sometimes forms what appears to be a bright, glowing tail when it gets near the Sun.
5. Jupiter is the ________ planet in size.
7. This is what we call the star in the center of our solar system.
12. Mars looks ________ because the rocks on its surface contain iron oxide.
Directions: Explain the relationship among the following groups of words. Use complete sentences.

1. star’s color, temperature, cool, medium, hot

2. supergiant, supernova, neutron star, black hole

3. giant, white dwarf, black dwarf

4. elliptical, spiral, irregular, Milky Way

5. astronomical units, light-years

6. huge clouds of gas and dust, gravity, fusion

7. Milky Way, galaxies, universe
Section 1  Earth’s Place in Space

A. Earth _______________, even though it appears that the Sun does.
   1. Rotation—spinning of Earth on its ______________, which occurs once every 24 hours
   2. Earth moves around the Sun in a regular, curved ______________ called an orbit.
   3. It takes one year for Earth’s __________________ around the Sun.
   4. ______________ occur due to Earth’s tilted axis and its revolution around the Sun.

B. The Moon __________________ around Earth every 27.3 days.
   1. The Moon’s changing shapes are known as ________________ of the Moon.
   2. The Moon’s phases are caused by the __________________ of Earth, the Moon, and
      the ____________.
      a. When the Moon changes from new to full, it is called ________________.
      b. When the Moon changes from full to new, it is called ________________.
   3. A solar ________________ occurs when the Moon is between the Sun and Earth and
      the Moon’s shadow falls on Earth.
   4. A _______________ eclipse occurs when Earth is between the Moon and the Sun and
      Earth’s shadow falls on the Moon.

Section 2  The Solar System

A. ________________—the Sun, its nine planets, and other objects that orbit the Sun
   1. ________________ in space are so vast they require different units of measurement
      than are used to measure things on Earth.
   2. An ________________ is about 150 million km, the mean distance from
      Earth to the Sun.
B. Inner planets are ______________, with minerals similar to those on Earth.

1. ______________—second-smallest planet and closest to the Sun
   a. Little atmosphere, resulting in extremes of temperature
   b. Heavily cratered surface
2. ______________—second-closest to the Sun
   a. Heavy cloud layer
   b. Clouds trap solar energy, making the planet extremely hot—about 470° Celsius.
3. ______________—third planet from the Sun
   a. Atmosphere allows life to flourish
   b. Water exists as a solid, liquid, and gas.
4. ______________—fourth planet from the Sun
   a. Has seasons and polar ice caps
   b. May have water shaping its surface
5. The ________________ separates the inner and outer planets.

C. Outer planets—most are huge balls of ____________

1. ______________—fifth planet from the Sun and largest
   a. Has 16 moons
   b. Great Red Spot is a giant storm on the planet’s surface.
2. ______________—sixth planet from the Sun
   a. Has 18 moons
   b. Several broad rings of ice and dust
3. ______________—seventh planet from the Sun
   a. Axis makes the planet spin nearly sideways
   b. Has rings and at least 18 moons
4. ______________—eighth planet from the Sun
   a. A gas planet with rings and 8 moons
   b. Methane and helium in its atmosphere give planet a blue color.
Note-taking Worksheet (continued)

5. ______________—smallest planet and farthest from the Sun
   a. Rocky and frozen crust
   b. One moon

6. ______________—large body of frozen ice and rock that travels toward the center of the solar system

7. ______________—fragments of space material that land on Earth’s surface
   a. Pieces may be iron, rock, or both
   b. Age (4.5 billion years) provides a clue to the Solar System’s age

Section 3  Stars and Galaxies

A. ______________—groups of stars that form a pattern in the sky

B. A star has a ______________ that depends on its size.
   1. Stars begin as huge clouds of dust and gas that contract and heat up to the point of ______________.
   2. Small stars shine ______________ than larger stars.
   3. A medium-sized star ends up as a black dwarf, while a larger star explodes as a ______________ that could eventually become a black hole.

C. ______________—group of stars, gas, and dust held together by gravity
   1. ______________-shaped galaxies are most common.
   2. ______________ galaxies look something like a pinwheel.
   3. ______________ galaxies are smaller and less common than other galaxies.
   4. Earth is located in the ______________ Galaxy.
   5. A ______________ is the distance light travels in a year, approximately 9.5 trillion km.
   6. The ______________, containing billions of galaxies, seems to be expanding.
Part A. Vocabulary Review

Directions: Use the words in the list to fill in the blanks below.

<table>
<thead>
<tr>
<th>constellation</th>
<th>galaxy</th>
<th>rotation</th>
<th>eclipse</th>
<th>solar system</th>
<th>revolution</th>
</tr>
</thead>
</table>

1. When the Moon’s shadow travels across part of Earth, a(n) ____________________ has occurred.
2. The term for the nine planets and other objects that orbit the Sun is ____________________.
3. The spinning of Earth on its axis is called Earth’s ____________________.
4. The movement of Earth around the Sun is known as Earth’s ____________________.
5. A group of stars that forms a pattern in the sky is called a(n) ____________________.
6. A(n) ____________________ is a group of stars, gas, and dust held together by gravity.

Part B. Concept Review

Directions: Answer the following questions using complete sentences.

1. What causes day and night on Earth?

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________

2. What causes seasons?

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________

3. Describe the movement of the Moon in relation to Earth.

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________

4. In which galaxy is Earth located? How many galaxies might there be?

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________
5. In the space below, draw a model of the solar system. Indicate and label all of the following.

- comets
- the outer planets
- Pluto
- Neptune
- Uranus
- Jupiter
- the smallest planet in the solar system
- the largest planet in the solar system
- the asteroid belt
- the inner planets
- Mars
- Earth
- Venus
- Mercury
- the Sun
- an astronomical unit
## The Solar System and Beyond

### I. Testing Concepts

**Directions:** Match the description in Column I with the item in Column II by writing the correct letter in the space provided.

<table>
<thead>
<tr>
<th>Column I</th>
<th>Column II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. a group of stars, gas, and dust held together by gravity</td>
<td>a. galaxy</td>
</tr>
<tr>
<td>2. all galaxies and all their stars</td>
<td>b. elliptical</td>
</tr>
<tr>
<td>3. the spinning of Earth on its axis</td>
<td>c. revolution</td>
</tr>
<tr>
<td>4. a group of stars that forms a pattern in the sky</td>
<td>d. axis</td>
</tr>
<tr>
<td>5. the movement of Earth around the Sun</td>
<td>e. rotation</td>
</tr>
<tr>
<td>6. the imaginary line around which Earth rotates</td>
<td>f. solar system</td>
</tr>
<tr>
<td>7. a huge star that begins to use the gases in its core</td>
<td>g. universe</td>
</tr>
<tr>
<td>8. the nine planets and other objects that orbit the Sun</td>
<td>h. solar eclipse</td>
</tr>
<tr>
<td>9. when the Moon’s shadow travels across part of Earth</td>
<td>i. constellation</td>
</tr>
<tr>
<td>10. the most common form of galaxy</td>
<td>j. supergiant</td>
</tr>
</tbody>
</table>

**Directions:** For each of the following, write the letter of the term or phrase that best completes the sentence or answers the question.

11. Which statement is true?
   a. Earth spins on its axis.
   b. The Moon revolves around Earth.
   c. Both Earth and the Moon revolve around the Sun.
   d. all of the above

12. Which takes the least amount of time?
   a. Earth rotates once.
   b. Earth revolves once.
   c. The Moon revolves once.
   d. All take the same amount of time.

13. Seasons are a result of ______.
   a. Earth’s rotation
   b. Earth’s tilted axis
   c. the Moon’s rotation
   d. the Moon’s revolution

14. What is an astronomical unit?
   a. average distance from Earth to the Sun
   b. amount of time it takes Earth to orbit the Sun
   c. average distance from Earth to the Moon
   d. amount of time it takes light to travel from the Sun to Earth
Chapter Test (continued)

15. What is the Sun?
   a. star  b. galaxy  c. planet  d. solar system

16. Which is the largest?
   a. supergiant  c. solar system
   b. constellation  d. galaxy

17. Earth is the ______ planet from the Sun.
   a. first  b. second  c. third  d. fourth

18. What is the best estimate of the number of galaxies in the universe?
   a. one  b. thousands  c. millions  d. billions

19. When the Moon is waxing, it appears to be getting ______.
   a. closer  b. farther away  c. larger  d. smaller

20. What is the largest planet in the solar system?

II. Understanding Concepts

Skill: Making Diagrams

Directions: Read and complete the following sets of directions.

1. Make a diagram of a solar eclipse. Label Earth, the Moon, the Sun, and the Moon’s shadow.

2. Make a diagram of a lunar eclipse. Label Earth, the Moon, the Sun, and Earth’s shadow.
Chapter Test (continued)

Skill: Sequencing

3. Number the following planets and the asteroid belt to show their location in the solar system. Number the object closest to the Sun 1, the second closest object 2, and so on.

___ a. Pluto
___ b. Jupiter
___ c. Earth
___ d. Saturn
___ e. Neptune
___ f. Venus
___ g. Uranus
___ h. Mars
___ i. the asteroid belt
___ j. Mercury

III. Applying Concepts

Directions: Match the planets on the right with their descriptions on the left.

___ 1. has an atmosphere of thick clouds that trap solar energy and can get as hot as 470°C

___ 2. has a very thin atmosphere and can get very hot during the day and very cold at night

___ 3. looks blue and has a moon that shoots gaseous nitrogen into space

___ 4. has a surface temperature that allows water to exist as a solid, a liquid, and a gas

___ 5. is a small, rocky planet with a frozen crust

___ 6. looks red because rocks on its surface get rusty

___ 7. is known for its dazzling rings and a moon whose atmosphere seems to be much like that of Earth long ago

___ 8. is the largest planet and has a giant storm called the Great Red Spot

___ 9. looks blue-green and has an axis that is tilted almost even with the planet's plane of orbit

a. Jupiter
b. Earth
c. Neptune
d. Saturn
e. Mars
f. Pluto
g. Uranus
h. Venus
i. Mercury
IV. Writing Skills

Directions: Answer the following questions using complete sentences.

1. Which other planet in the solar system seems most like Earth? Explain the reason for your choice.

2. Compare and contrast the outer planets of the solar system with the inner planets.

3. What causes the phases of the Moon?

4. How is a star formed?

5. List what makes up a galaxy and describe the three major shapes of galaxies.