



## TEACHER GUIDE

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## STUDENT HANDOUTS

- Reading Comprehension

1. <i>An Introduction to the Universe</i> .....	
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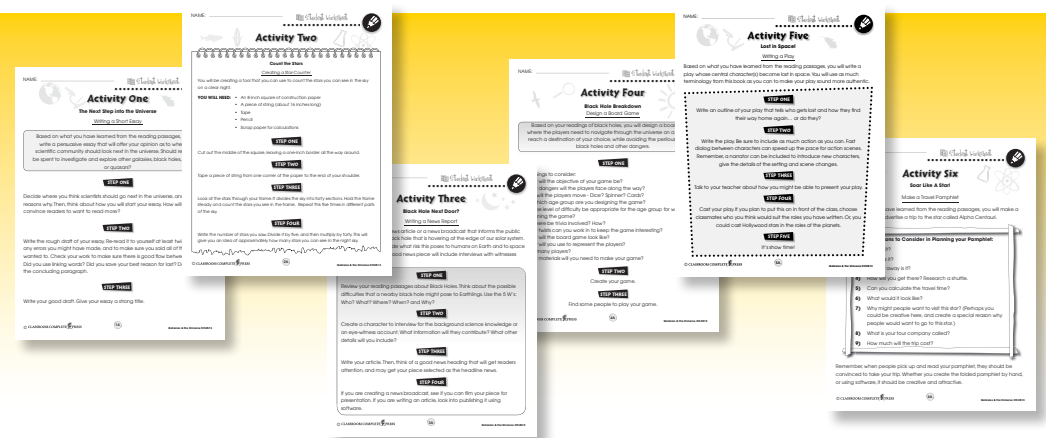
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**FREE!**

**6 Bonus Activities!**

**3 EASY STEPS** to receive your 6 Bonus Activities!

- Go to our website:  
[www.classroomcompletepress.com/bonus](http://www.classroomcompletepress.com/bonus)
- Click on item CC4513 – Galaxies & the Universe
- Enter pass code CC4513D





# Galaxies

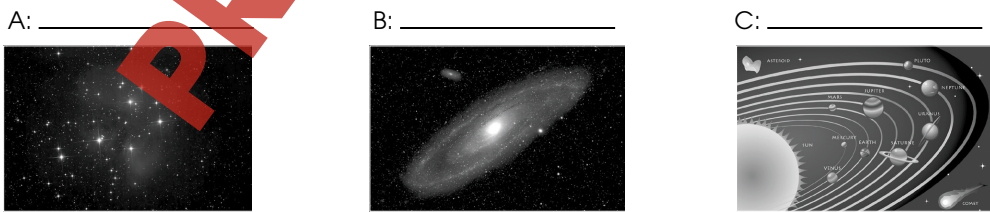
1. **Activate your prior knowledge:** You might already know that the solar system is part of the Milky Way galaxy. What else do you know about the Milky Way? Give as much detail as you can.

2. Complete each sentence with a word from the list. Use a dictionary to help you.

- |      |        |         |     |           |              |
|------|--------|---------|-----|-----------|--------------|
| star | galaxy | gravity | Sun | Milky Way | solar system |
|------|--------|---------|-----|-----------|--------------|

- The stars in a galaxy are held together by a strong pull called \_\_\_\_\_. This is the same force that holds things onto the Earth.
- A \_\_\_\_\_ is a ball of hot gas that is burning in the Universe. Eventually, they all burn out, explode or cool off.
- Stars are gathered into large groups. Each large group of stars is called a \_\_\_\_\_.
- The Sun is the center of our \_\_\_\_\_. All of the planets orbit around the Sun.
- The \_\_\_\_\_ is just one of the stars that are part of our galaxy. It rotates around the center of the galaxy like all of the other stars in it.
- Our galaxy is called the \_\_\_\_\_ because of how it looks when you see it spread out across the sky.

3. a) Label the diagrams using the following words: star, solar system, galaxy.



b) List the above objects in order from smallest to largest.



# Galaxies

## The Milky Way Galaxy

**T**he Sun is just one of the millions of stars in the spiral **Milky Way** galaxy. When we look out at the night sky from Earth, we are seeing just a small portion of the millions of stars in our galaxy. The Milky Way belongs to a cluster of about thirty other galaxies called the **Local Group**. Some larger clusters can have up to 2,500 galaxies in them.

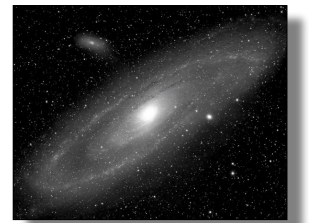


The Milky Way is a large galaxy. It is about 100,000 light years across. Like all other galaxies, the stars **rotate** around the center. Our solar system is rotating around the center of the Milky Way. It is about 32,000 light years from the center. It is such a large galaxy that it takes about 250 million years to orbit around just once. That means that since the time of dinosaurs on Earth, we have only orbited around the Milky Way once!

It is possible to see the Milky Way without a telescope on a clear night. It looks like a wide, thick band of stars stretching across the sky. In ancient times, people thought it looked like a band of spilled milk. That's how our galaxy got its name. The best time to see it is between the months of July and September. It also looks impressive on dark, winter nights.

## The Andromeda Galaxy

**T**he Andromeda Galaxy, M31, is the farthest object that can be seen from Earth without a telescope. It is 2.5 million light years away. It is similar looking to the Milky Way, but larger and with more stars. It would take about 150,000 light years to get across it. The Andromeda Galaxy is the largest spiral galaxy known, and the largest member of our **Local Group** of galaxies.



**Think about this:** If the Andromeda Galaxy and Milky Way are just two of thirty galaxies in our local group, and there are millions of galaxies, just how big must the universe be?



# Galaxies

1. Use the words in the box to answer each question.

- |                |                    |                        |             |               |
|----------------|--------------------|------------------------|-------------|---------------|
| elliptical red | Milky Way Big Bang | interstellar Andromeda | spiral blue | Ice Age Local |
|----------------|--------------------|------------------------|-------------|---------------|

- \_\_\_\_\_ What is the shape of the Milky Way galaxy called?
- \_\_\_\_\_ What is the space between the stars called?
- \_\_\_\_\_ Which group of galaxies does the Milky Way belong to?
- \_\_\_\_\_ Which event marked the beginning of time in our Universe?
- \_\_\_\_\_ Which galaxy is the farthest object in the Universe that can be seen with the naked eye?
- \_\_\_\_\_ Which stars are hotter: red or blue stars?

2. Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

- Galaxies are groups of stars, held together by gravity that rotate around their own center.  
**TRUE**      **FALSE**
- Galaxies come in different shapes, like the spiral, whirlpool, starburst and carousel galaxies.  
**TRUE**      **FALSE**
- The Earth and its solar system are just a tiny part of the Milky Way galaxy.  
**TRUE**      **FALSE**
- The Milky Way galaxy is the only galaxy that can be seen from Earth with the naked eye. The others are too far away to be seen.  
**TRUE**      **FALSE**
- The Milky Way galaxy is only slightly larger than the solar system.  
**TRUE**      **FALSE**
- The Andromeda galaxy is larger than the Milky Way galaxy, and is the same shape as well.  
**TRUE**      **FALSE**



# Galaxies

3. Answer each question with a complete sentence.

- Why do you think new galaxies are being discovered all of the time?  
\_\_\_\_\_  
\_\_\_\_\_
- Where are new galaxies forming?  
\_\_\_\_\_  
\_\_\_\_\_
- Which is larger, the size of the galaxies or the space in between them?  
\_\_\_\_\_  
\_\_\_\_\_

## Research & Extension

**Light pollution** is an environmental problem that threatens to erase our night sky. You will research this problem and write a report to help inform others about it. Follow the steps below:

- Conduct research on the growing problem of light pollution.
- Organize your findings on the graphic organizer provided.
- Once you have filled each box to your satisfaction, write a report about the problem of light pollution. Organize your report into three paragraphs, based on the boxes from the organizer.
- Re-read your report at least three times. Edit any mistakes that you find. Don't be afraid to change the order of things you wrote, and add in more information.
- Write, or type, a good draft of your report. Don't forget to include a title.





# Try It!

## A COMPARISON OF THE SUN AND EARTH

In this activity you will gain a better understanding of the size of the Sun compared to the Earth.

### You will need:

- about 125 pennies
- piece of chalk
- ball of string
- ruler or tape measure
- scissors

- Step One:** Cut a piece of string 115 cm (46 inches) long.
- Step Two:** Attach a piece of chalk to the end of the string making the entire length, end-to-end, 105 cm (42 inches).
- Step Three:** Have a friend hold the end of the string on the ground while you draw a full circle with the chalk at the other end.
- Step Four:** Draw a chalk line from the center of the circle (where your friend is standing) straight through the middle from one side to the other. This model represents the diameter of the Sun.
- Step Five:** Place the pennies side-by-side on the chalk line. Then, count the pennies and jot down the number.
- Step Six:** Now place a single penny next to the Sun. This penny is the entire planet Earth! One penny!
- Step Seven:** Use your math skills to determine how many times larger the diameter of the Sun is than the diameter of the Earth.



# Word Search

Find all of the words in the Word Search. Words are written horizontally, vertically, diagonally, and some are even written backwards.

- |                    |                     |           |            |
|--------------------|---------------------|-----------|------------|
| universe           | nebula              | quasar    | light year |
| interstellar space | gravitational force | Milky Way | atoms      |
| Big Bang           | astronomer          | hydrogen  | collide    |
| galaxy             | black hole          | gravity   |            |
| mass               | satellite           | matter    |            |
| explosion          | theory              | compress  |            |



### Part A

## Comprehension Quiz

Circle the word **TRUE** if the statement is TRUE or Circle the word **FALSE** if it is FALSE.

- The solar system consists of the Sun and everything that orbits it.  
**TRUE**      **FALSE**
- Looking out into the universe is like looking back in time.  
**TRUE**      **FALSE**
- A *light year* is not quite as long as a year. It is only 300 days.  
**TRUE**      **FALSE**
- A *nebula* is a cloud of dust and gas in space.  
**TRUE**      **FALSE**
- Gravity is a force that pushes two objects away from each other.  
**TRUE**      **FALSE**
- The Sun is a star in the Milky Way galaxy.  
**TRUE**      **FALSE**
- The force of gravity is so weak near black holes that they are invisible.  
**TRUE**      **FALSE**
- Scientists continue to discover new things about the universe.  
**TRUE**      **FALSE**

### Part B

Sort the words in the Word Bank into logical groups by writing each word into a space that makes the best fit. (e.g. PETS: cat, dog, rabbit)

- Quasar: old far a) \_\_\_\_\_
- Galaxies: elliptical barred b) \_\_\_\_\_
- Big Bang: explosion fireball c) \_\_\_\_\_
- Light year: measure travel d) \_\_\_\_\_
- Nebula: gas dust e) \_\_\_\_\_
- Milky Way: Local Group stars f) \_\_\_\_\_

**WORD BANK**  
distance  
spiral  
cloud  
galaxy  
bright  
theory

## The Andromeda Galaxy



### Different Shapes of Galaxies



BARRED SPIRAL



ELLIPTICAL



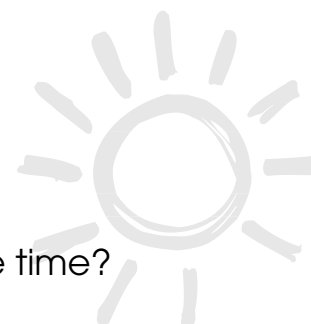
IRREGULAR



After You Read

NAME: \_\_\_\_\_

# Galaxies



### 3. Answer each question with a complete sentence.

a) Why do you think new galaxies are being discovered all of the time?

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

b) Where are new galaxies forming?

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

c) Which is larger, the size of the galaxies or the space in between them?

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

### Research & Extension

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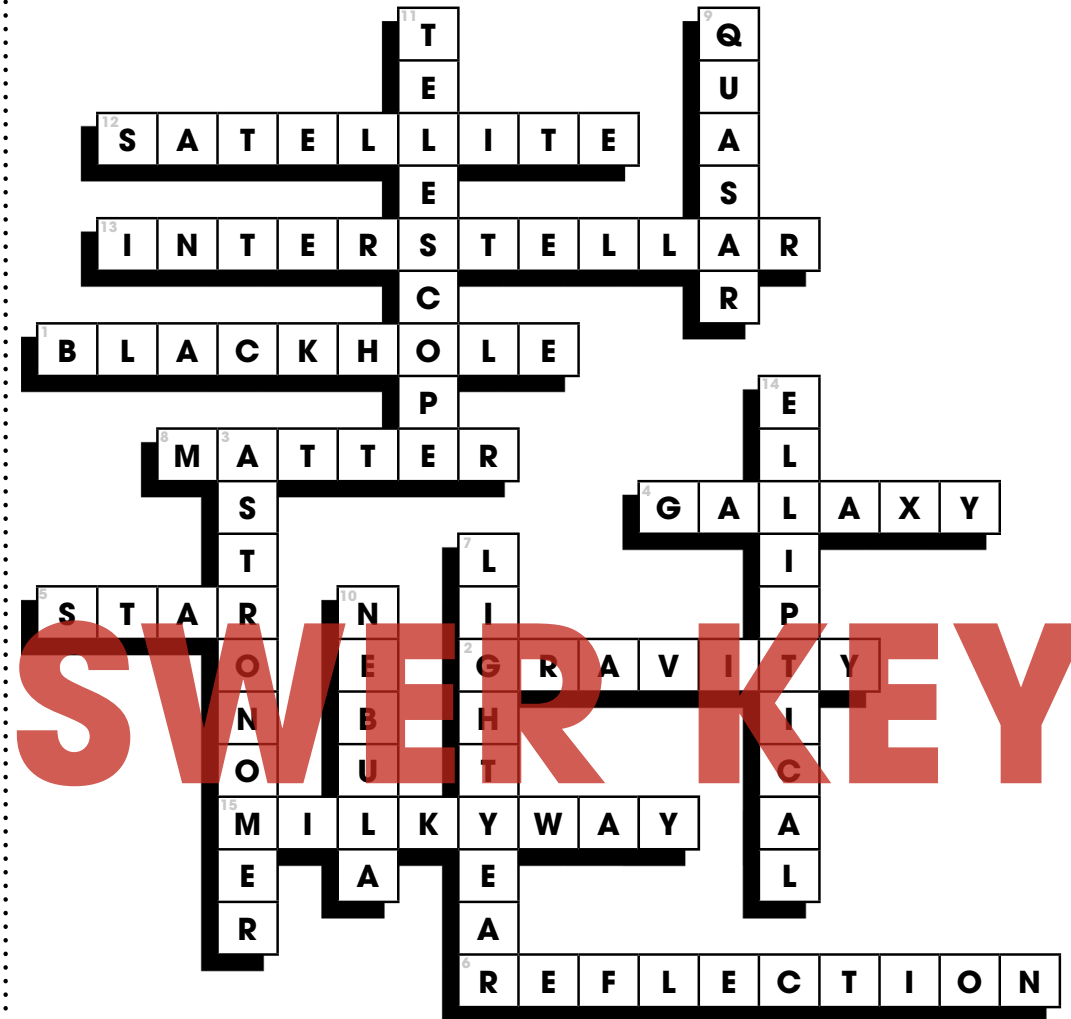
3.

a) more powerful telescopes being invented or universe continues to expand

b) at the 'edge' of the universe

c) space between them

## Crossword Puzzle!



# EASY MARKING ANSWER KEY

