

SOLAR SYSTEM UNIT STUDY WORKBOOK

Five ready-to-use activities generated through HomeTrail's Nest pack system for a fourth-grade learner. Print the pages you need and use the separate audio episode alongside the workbook.

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Deep Dive

Gravity's Solar System Team

Look up at the night sky and you are seeing a busy family of worlds. The Sun, planets, moons, asteroids, and comets all belong to our solar system. Gravity helps organize this family, while careful measurements help scientists compare objects that are very far apart.

Gravity Pulls Objects Together

Gravity is a pull between objects. A planet's gravitational pull can act like a scale, helping scientists learn how much the planet weighs. Gravity also helps organize the solar system by affecting planets, moons, and other objects.

Why Planets Orbit the Sun

An orbit is a regular, repeating path that one object takes around another object. Each planet travels around the Sun in its own orbit. The time needed to complete one trip is different for each planet. Earth takes about 365 days, while Mercury takes 88 days.

Comparing Worlds Across Space

Scientists compare planets by studying measurements such as weight and the length of a year. They can also compare distances. For example, the distance between Earth and the Sun is different from the distance between Earth and the Moon. These measurements help scientists describe worlds they cannot reach easily.

A Solar System with Many Kinds of Objects

Our solar system includes eight planets, dwarf planets such as Pluto, moons, asteroids, and comets. The Kuiper Belt contains icy objects past Neptune's orbit. Farther out, the Oort Cloud marks a much more distant region of the solar system.

Remember these

- Gravity is a pull that helps organize objects in the solar system.
- An orbit is a regular, repeating path around another object.
- The planets orbit the Sun, but each planet takes a different amount of time to complete a trip.
- Scientists can use gravitational pull like a scale to compare how much planets weigh.
- Measurements of time, weight, and distance help scientists study faraway worlds.

Try this

Make a simple solar system path with objects on a table. Put a large ball in the center for the Sun and place smaller objects around it for planets. Draw or trace a repeating path for each planet.

Discuss: Which object is at the center? Which objects travel around it? How could you compare the planets without picking them up?

Think about it

If you were a scientist comparing two planets, which measurement would you want to study first: their weight, their distance, or the length of their year? Why?

Sources

- [Solar System Exploration](https://science.nasa.gov/solar-system-exploration/)science.nasa.gov
- [Solar System | NASA Space Place – NASA Science for Kids](https://spaceplace.nasa.gov/solar-system/)spaceplace.nasa.gov



Gravity, Orbits, and Comparing Objects in Space

Instructions: Read each question carefully and select the best answer. When you're ready, tap Submit to see your results.

0 of 10 answered

1. Why do the planets orbit the Sun?

- ☐ A. The planets are tied to the Sun by invisible strings
- ☐ B. The Sun's gravity pulls them while their forward motion keeps them moving around it
- ☐ C. The planets stay in place because space has no air
- ☐ D. The planets are pushed around by sunlight

2. Which object has the strongest effect on the paths of most planets in our solar system?

- ☐ A. Earth's Moon
- ☐ B. A nearby asteroid
- ☐ C. A cloud of space dust
- ☐ D. The Sun

3. What would most likely happen to Earth if the Sun suddenly had no gravity?

- ☐ A. Earth would move directly toward the Sun
- ☐ B. Earth would stop moving completely
- ☐ C. Earth would fall into the Moon
- ☐ D. Earth would continue moving in a mostly straight path through space

4. Which statement best explains why the planets do not all travel at the same speed around the Sun?

- ☐ A. Planets at different distances from the Sun experience different gravitational effects
- ☐ B. The planets are powered by different kinds of sunlight

☐ C. The planets choose different speeds so they do not bump into one another

☐ D. The planets farther away have less space to travel

5. Which measurement is most useful for comparing the distances between stars?

☐ A. Degrees Celsius

☐ B. Grams

☐ C. Light-years

☐ D. Liters

6. Scientists discover a new planet that is much larger than Earth but much smaller than Jupiter. Which tool would best help them compare the two planets?

☐ A. A map of Earth's continents

☐ B. A clock showing when each planet rises

☐ C. A scale showing their masses or sizes

☐ D. A thermometer used only in a classroom

7. Why do scientists use models, diagrams, and scale drawings of the solar system?

☐ A. Diagrams can show every detail exactly as it appears

☐ B. Models make gravity stop working

☐ C. The planets are not actually in space

☐ D. The real objects and distances are too large to show at their true sizes in one room

8. Gravity is a force that can pull objects toward one another.

☐ True

☐ False

9. The Sun's gravity affects only the planets and cannot affect moons, asteroids, or comets.

☐ True

☐ False

10. A picture that shows planets at their correct relative sizes must also show their distances at the same scale.

☐ True

☐ False

Word Search: the solar system, Sun, planets, dwarf planets, moons, asteroids, comets, gravity, orbit, rotation, and scale

Explore the solar system by finding words about planets, moons, comets, asteroids, and the forces that guide their motion. Watch for clues about orbits, rotation, gravity, and the vast scale of space.

12 words left to find.

C	X	X	M	H	L	S	F	V	A	A	R
N	P	W	J	E	T	U	T	T	C	S	O
G	E	L	G	X	R	S	B	M	S	T	T
A	K	P	U	O	A	C	O	J	G	E	A
L	V	N	T	T	U	O	U	R	J	R	T
A	A	A	U	U	O	P	A	R	V	O	E
X	J	R	W	J	N	V	L	K	Y	I	C
Y	N	H	D	B	I	E	P	A	J	D	O
V	M	S	E	T	I	L	Z	U	N	T	M
L	T	K	Y	M	O	O	N	Z	H	E	E
N	K	N	V	P	C	R	R	X	R	M	T
J	O	R	B	I	T	A	O	L	R	P	C

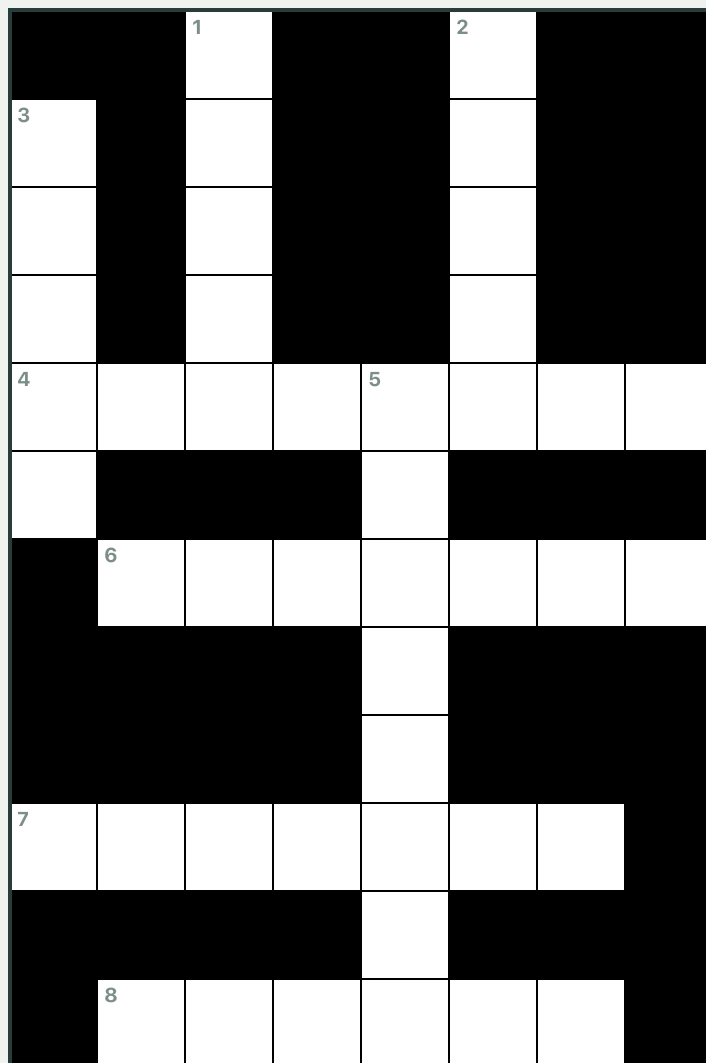
Find these words:

- ASTEROID
- GRAVITY
- MERCURY
- NEPTUNE
- PLANET
- ROTATE
- SATURN
- GALAXY
- ORBIT
- COMET
- PLUTO
- MOON

Exploring the Solar System

Instructions: Tap a clue, then fill each box with one letter. Tap again to switch between Across and Down.

8 clues left.



ACROSS

- 4.** A rocky object that travels around the Sun, usually smaller than a planet.
- 6.** The farthest major planet from the Sun, known for its blue color.
- 7.** The force that pulls objects toward one another and keeps planets in orbit.
- 8.** A large round body that travels around a star.

DOWN

- 1.** An icy space object that may form a glowing tail when it gets near the Sun.
- 2.** A dwarf planet found in a distant region called the Kuiper Belt.
- 3.** Related to the Sun, such as solar energy or the solar system.
- 5.** The spinning of an object, such as Earth turning on its axis.

