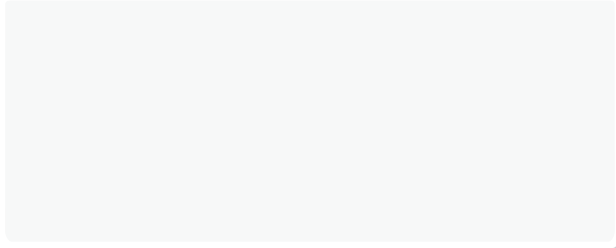




# How do the planets move?

**01** Draw a circle and an ellipse. With a classmate, discuss the differences.



**02** Read "Which planet are you on?" Write "T" if the statements are true and "F" if they are false.

- The planets move in circular orbits around the Sun.
- The planets maintain a steady speed as they orbit the Sun.
- The planets that are closer to the Sun have a shorter orbit than the planets that are further from it.
- Planets that are closer to the Sun experience a stronger gravitational pull.

☐☐☐☐

**03** Read the text again. Match the words with their definition.

- |                 |  |
|-----------------|--|
| 1. trajectories | a. relating to the circular movement of an object around another one |
| 2. orbital      | b. a curve describing something's path                               |
| 3. elliptical   | c. to move rapidly   |
| 4. zoom         | d. a shape like that of a flattened circle                           |
| 5. conversely   | e. forward movement with little speed                                |
| 6. slower-paced | f. opposite to   |

## Which planet are you on?

We already know that the Sun's gravitational pull keeps the planets from hurtling out into space, yet their path is not so straightforward. Firstly, the planets make an elliptical path, not a circular one, as German astronomer Johannes Kepler initially suggested in the first law of planetary motion, published in 1609. The law states that our star is at one of the foci of the planets' **elliptical** orbits, meaning that at some point in their **trajectories**, these heavenly bodies are closer to the Sun than at others.

These peculiar orbit patterns mean that the planets move at different velocities depending on their relative position to the Sun. As they move further from our star, they experience less gravitational pull and thus, are more **slow-paced**. **Conversely**, moving closer to it, they speed up, **zooming** about in their orbits.

The time a planet takes to rotate around the Sun is due to two factors stemming from each planet's position relative to our star. Firstly, the further away a planet is from the Sun, the longer its **orbital** path, while the converse is true for planets nearer to the Sun. Additionally, the more distant a planet is, the lower the gravitational pull it feels, so the slower it goes compared to closer planets. Therefore, although it takes us 365 days to orbit our star, Mercury, the closest to the Sun, takes 88 Earth days, and the most distant planet, Neptune, completes its yearly journey in over 60 thousand.



**04** Using the words in bold from the text, compare the elements below with a classmate.

- the distance between the Sun and a planet depending on its point in orbit
- the speed of the orbit of different planets around the Sun
- the distance travelled by different planets around the Sun

05 Decide if the underlined section describes the past “PA” or present “PR.”

1. Having written the first law of planetary motion, Kepler wrote two more.

2. Making observations with a telescope, Joanne discovered a new moon.

3. Living next to the observatory, he gets to attend most exhibitions for free.

4. Originally considered a planet, Pluto was reduced to dwarf planet status in 2006.

5. Having watched all of Sagan’s documentaries, she felt better informed.

6. Trying to understand the planet’s trajectories better, she’s drawing them out.

06 Write a summary in the organizer below describing the effect of gravity on the planets’ movement in space.

07 Complete the sentences with the correct form of the word in parentheses.

- \_\_\_\_\_ in a big city for 10 years, Sarah was surprised by how many stars she could see in the countryside when she moved there. (live)
- \_\_\_\_\_ an outcast in his time, Galileo is now taken as a genius. (consider)
- \_\_\_\_\_ for the big screen, the documentary about space seems less impressive on a phone. (write)
- After \_\_\_\_\_ at the planetarium for many years, Jane picked up several facts about space. (volunteer)
- \_\_\_\_\_ the Sun, the Earth maintains a safe temperature. (orbit)
- \_\_\_\_\_ Kepler’s laws for years, Alex understood a lot about the movement of the planets. (study)

08 Act out the movements of the planets as they orbit the Sun. In the organizer below, decide who will perform what role.

|         |  |
|---------|--|
| Sun     |  |
| Earth   |  |
| Mars    |  |
| Mercury |  |
| Jupiter |  |
| Neptune |  |
| Venus   |  |
| Saturn  |  |
| Uranus  |  |