THE SCHOOLS' OBSERVATORY

CALCULATE THE SPEED OF THE PLANETS

PROUD TO BE PART OF
LIVERPOOL
JOHN MOORES
UNIVERSITY

TASK 1

Complete the table below to calculate the speed at which each of the planets in the Solar System is travelling.

ASSUMPTION:

For this activity, you will assume that all planets travel in circular orbits around the Sun. In reality, their orbits are elliptical.

YOU WILL NEED:

- The Planet Datasheet
- The following formulae:
    - circumference of a circle = $2\pi r$
    - Speed = distance ÷ time

> **TIP!**
> Think about the units of measurement involved.

Planet	Distance travelled in 1 orbit (km)	Time taken for 1 orbit (hours)	Speed of travel (km/hour)
Mercury	357,186,518	2,112	169,122
Venus	676,774,456	5,400	125,328
Earth	939,964,522	8,766	107,228
Mars	1,428,746,073	16,488	86,654
Jupiter	4,887,815,514	104,315	46,856
Saturn	8,882,664,732	258,158	34,408
Uranus	18,047,318,822	736,344	24,509
Neptune	28,255,333,530	1,444,637	19,559

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TASK 2

Answer the following questions (it may help if you write them in order, from slowest to faster):

1. Which planet is the **fastest?**

2. Which planet is the **slowest?**

3. What is the **range** of the speeds?

Mercury
Neptune
149,536 km/hr

TASK 3

Draw a scatter graph of the **speed** of planets against **distance from the Sun** in AU.

Do you notice any pattern or correlation?

Planets speed decreases with distance from the Sun / planets speed increases as distance from the Sun decreases / correlation is not linear

What might cause any pattern or correlation you see?

Distance from the Sun / gravity of the Sun / gravity getting weaker with distance