

National Science Day maths for CBSE Class 9 and 10

CBSE Math Revision · CBSE Class 9 and 10 · Student sheet

Name _____

Class _____

Date _____

No calculator. Every answer works out exactly; each question gives the values to use.

Starter (5 minutes)

1. Write 300 000 000 in standard form.
2. Work out $(2.5 \times 10^3) \times (4 \times 10^2)$ in standard form.
3. A train covers 150 km in 2.5 hours. Find its average speed.
4. Simplify $(2^3)^2$ and write it as a number.

Main activity (35 minutes)

Task A: Light and standard form

Take the speed of light as 3×10^8 m/s and the distance from the Earth to the Sun as 1.5×10^{11} m (rounded values).

- a. How far does light travel in 1 minute? Give your answer in standard form.
- b. How many seconds does light take to travel from the Sun to the Earth?
- c. Write your answer to part (b) in minutes and seconds.

Task B: Pinhole cameras and shadows

Light travels in straight lines, so a pinhole camera and a shadow both make similar triangles.

- a. A pinhole camera is 10 m from a 2 m tall person. The screen is 20 cm behind the pinhole. How tall is the image?
- b. With the screen 15 cm behind the pinhole, a 6 m tall tree makes an image 3 cm tall. How far is the tree from the pinhole?
- c. At the same time of day, a 1.5 m stick casts a 2 m shadow and a tower casts a 48 m shadow. Find the height of the tower.

Task C: Halving and straight lines

Two patterns that scientists meet all the time. The numbers are made up.

- a. A 640 g sample of a radioactive substance halves every 5 days. How much is left after 20 days?
- b. After how many days are only 5 g left?
- c. The length of a spring is $L = 20 + 2m$ cm when a mass of m kg hangs from it. Find the length for 3.5 kg, and the mass that makes it 31 cm long.

Extension

1. You hear thunder 6 seconds after you see the lightning. How far away is the storm? (Light arrives almost at once.)
2. You clap and hear the echo from a cliff 1.5 seconds later. How far away is the cliff?