

Marble Math

A second trip through scale models, scientific notation, light-time rates, and the size-ratio trap.

[scale models] [scientific notation] [unit rates] [QUESTIONS ONLY] [PRINT-FRIENDLY]

NAME	PERIOD	DATE
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QUESTIONS ONLY - Practice independently or with a group. Use the class sheet as a model, but solve these numbers yourself.

PART A

Scale it down

A model uses 1 cm to represent 1,000 km. Earth's diameter is about 12,700 km.

1 What diameter should Earth have in the model?

2 A planet is 5 cm wide in the model. What is its actual diameter?

PART B

Notation in the wild

Mars is about 228,000,000 km from the Sun. Jupiter is about 778,000,000 km away.

1 Write both distances in scientific notation.

2 About how many times farther from the Sun is Jupiter than Mars? Round to the nearest whole number.

PART C

How old is the light?

Light travels about 300,000 km each second. Sunlight takes about 500 s to reach Earth.

1 How far does light travel in 60 s?

2 How many minutes is 500 s? Why is the answer a rate problem?

PART D

The volume trap

Jupiter's diameter is about 11 times Earth's diameter. A sphere's volume scales with the cube of its diameter.

1 Estimate how many Earth-volumes fit in Jupiter using 11^3 .

2 Why is 11 times too small for a volume comparison?
