
GEOMETRY: SCALE MODELS & RATIOS**Best Guess Mastery Worksheet (Target Grade 4/5)****I Do**

A plane has a length of 78 metres.

A scale model is made of the plane.

The scale of the model is 1 : 200

Work out the length of the scale model.

Give your answer in centimetres.

Length = cm

We Do

Jo makes a scale model of a ship.

The scale of the model is 1 : 150

The model ship has a length of 45 centimetres.

Work out the real length of the ship.

Give your answer in metres.

Length = m

GEOMETRY: SCALE MODELS & RATIOS**Best Guess Mastery Worksheet (Target Grade 4/5)****You Do 1**

A real skyscraper has a height of 320 metres.

Fin makes a scale model of the skyscraper.

The scale of the model is 1 : 500

Work out the height of the scale model.

Give your answer in centimetres.

Height = cm

You Do 2

A real car has a length of 4.2 metres.

Doug makes a scale model of the car.

The length of the scale model is 14 centimetres.

Work out the scale of the model.

Give your answer in the form 1 : n

Scale = 1 :

GEOMETRY: MAP SCALES & AREA FACTORS**Best Guess Mastery Worksheet (Target Grade 5/6)****Challenge 1**

A map has a scale of 1 : 50000

Sarah measures the distance between two towns on the map as 8.4 cm.

She walks between the two towns at an average speed of 5 km/h.

Work out how long it takes Sarah to walk between the two towns.

Give your answer in minutes.

Time = minutes

Challenge 2

Don builds a scale model of a large statue.

The scale of the model is 1 : 20

The surface area of the model statue is 150 cm².

Work out the real surface area of the statue.

Give your answer in square metres (m²).

Area = m²

Answers & Worked Solutions

I Do:

1. Convert the real length into centimetres: $78 \text{ m} \times 100 = 7800 \text{ cm}$.
2. Apply the scale (divide by 200 to scale down to the model): $7800 \div 200$
3. $7800 \div 200 = 78 \div 2 = \mathbf{39 \text{ cm}}$.

We Do:

1. Apply the scale (multiply by 150 to scale up to the real ship): $45 \text{ cm} \times 150$
2. $45 \times 150 = 6750 \text{ cm}$.
3. Convert centimetres back into metres: $6750 \div 100 = \mathbf{67.5 \text{ m}}$.

You Do 1:

1. Convert the real height into centimetres: $320 \text{ m} \times 100 = 32000 \text{ cm}$.
2. Apply the scale (divide by 500 to scale down to the model): $32000 \div 500$
3. $32000 \div 500 = 320 \div 5 = \mathbf{64 \text{ cm}}$.

You Do 2:

1. Ensure both lengths are in the same units. Convert real length to cm: $4.2 \text{ m} \times 100 = 420 \text{ cm}$.
2. Set up the ratio equation: Model Length : Real Length = $14 : 420$.
3. Simplify to the form $1 : n$ by dividing both sides by 14.
4. $420 \div 14 = 30$. Therefore, the scale is **1 : 30**.

Challenge 1:

1. Find real distance in cm: $8.4 \text{ cm} \times 50000 = 420,000 \text{ cm}$.
2. Convert to km: $420,000 \div 100 = 4200 \text{ m}$. $4200 \div 1000 = 4.2 \text{ km}$.
3. Calculate time in hours: Time = Distance $\div$ Speed = $4.2 \div 5 = 0.84 \text{ hours}$.
4. Convert hours to minutes: $0.84 \times 60 = \mathbf{50.4 \text{ minutes}}$.

Challenge 2:

1. The Linear Scale Factor (LSF) is 20.
2. The Area Scale Factor (ASF) is $\text{LSF}^2 = 20^2 = 400$.
3. Find real surface area in cm^2 : $150 \text{ cm}^2 \times 400 = 60,000 \text{ cm}^2$.
4. Convert cm^2 to m^2 (divide by 100^2 , which is 10,000): $60,000 \div 10,000 = \mathbf{6 \text{ m}^2}$.