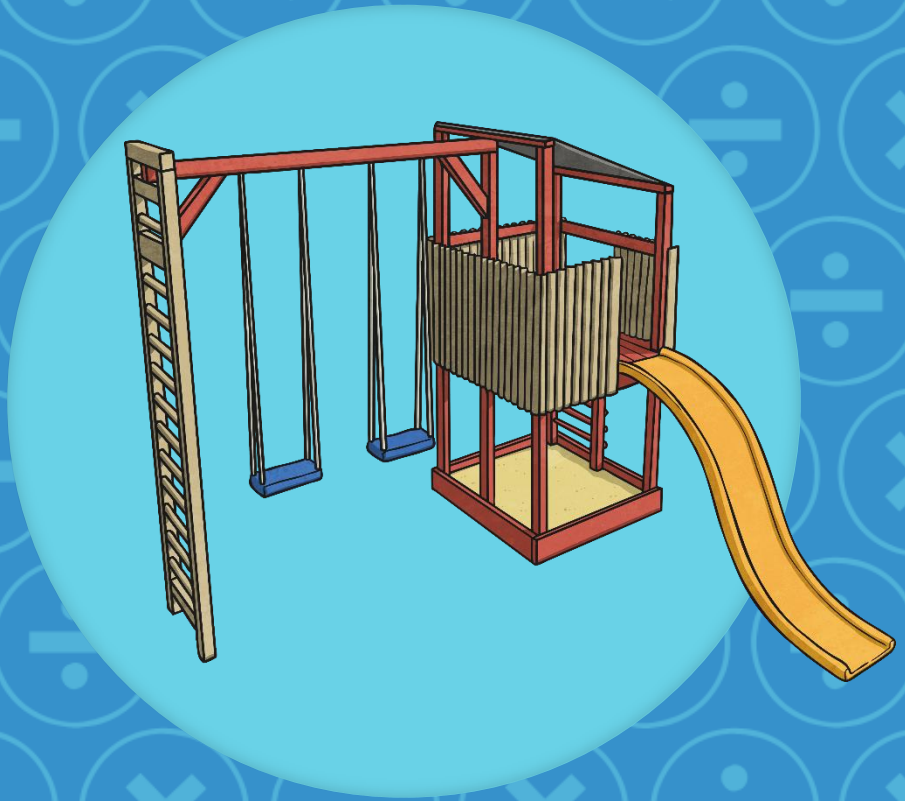
Playgrounds



Aim

- I can solve problems by scaling up and down.

Success Criteria

- I can use known multiplication facts to scale up.
- I can use known division facts to scale down.
- I can find the scale factor from two given measurements.

Invisible Digits

Find 2 numbers whose **sum is 10** and **product is 16.**

Challenge: Can you find 2 numbers whose **sum is 8** and **product is 12**?

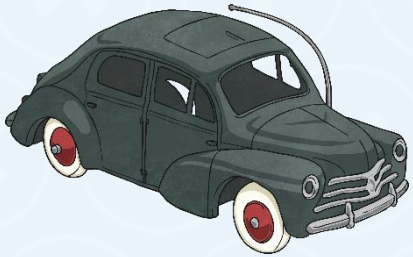
Scale Models

Scale Models

Maps, models and drawings are all things that can be made to scale.

Something that is made 'to scale' has the same proportions as the real thing, but is larger or smaller.

Scale models have a 'scale factor' which tells you how the size of the model relates to the size of the original thing.



This scale model of a toy car has a scale factor of **1:3**.

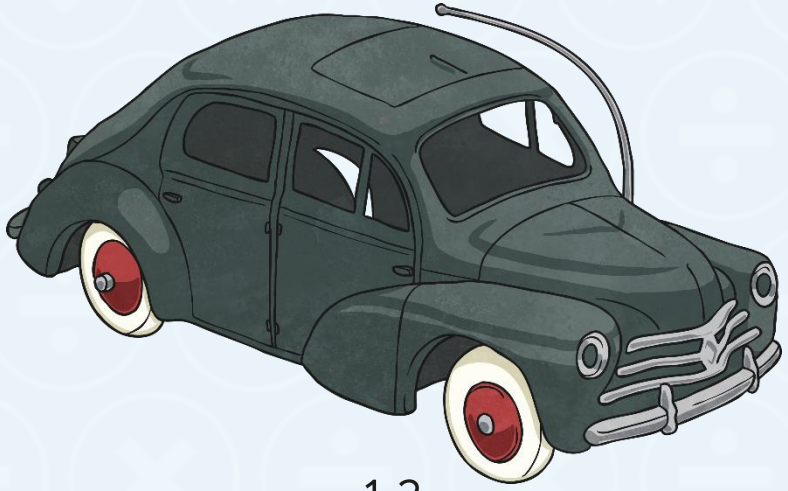
Everything on the original is **three times** bigger than on the scale model.

Scale Models

1cm on the model = **3cm** on the real car (3 × 1cm).

2cm on the model = **6cm** on the real car (3 × 2cm).

50cm on the model = **150cm** on the real car (3 × 50cm).

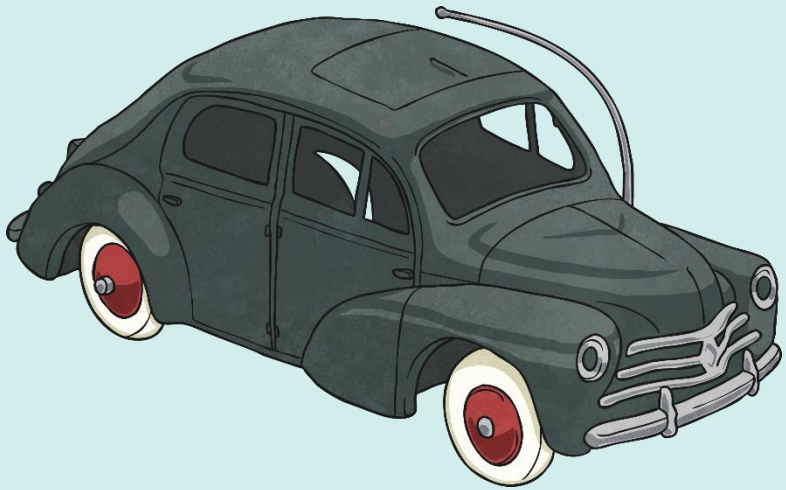


1:3

Scale Models

Scale factor: **1:3**.

What is the length of the real car if the length of the model is **100cm**?

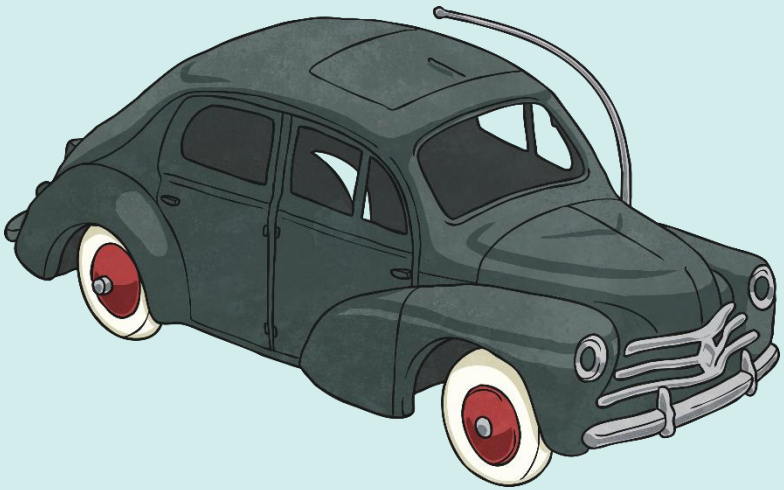


100cm

Scale Models

Scale factor: **1:3**.

What is the width of the model car if the original car is **60cm** wide?



? cm

Scale Models

This model aeroplane has a scale factor of **1:48**.

It is **48 times smaller** than the real thing.

Scale Models

This dolls house chair has a scale factor of **1:18**.

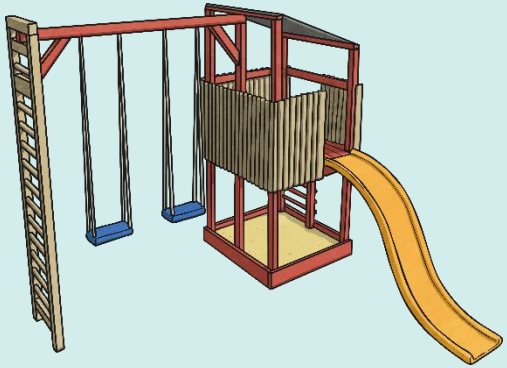
It is **18 times smaller** than the real thing.

Scale Models

This statue by Nina Akamu is called 'American Horse'.
It has a scale factor of **3:1**.

It is **3 times bigger** than the real thing.

Playground Model



The children of Park Primary School have been given the task of designing a new playground for their village. They must build a scale model of their playground in order to show the builders what they want the real playground to look like.

They will make their model **4 times smaller** than the real playground. This means that every 1cm on their model would be 4cm on the full size equipment. The model is $\frac{1}{4}$ of the size of the actual playground.

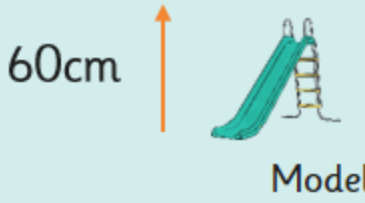
It has a scale factor of **1:4**.

Playground Model

The model slide is **60cm** high. How high is the real slide?

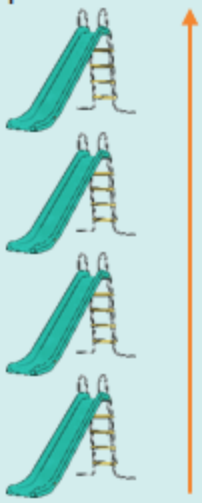
The real slide is **4 times** the height of the model.

To find the height of the real slide,
we need to multiply the height of the model by **4**.

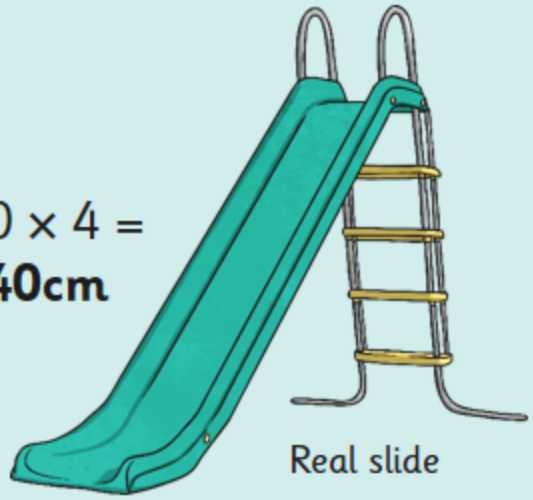


Model

Scale 1:4



$60 \times 4 =$
240cm

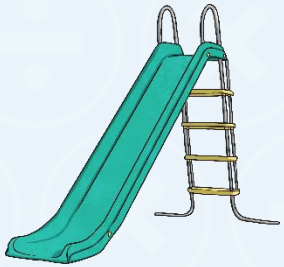


Real slide

Model Multiplication

What if the model was made to a different scale?

Can you calculate the length of the real slides?



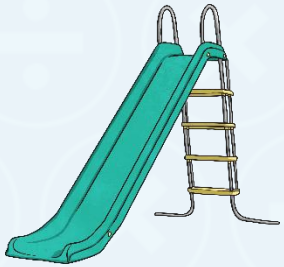
1:4 scale. The real slide is 4 times bigger than the model.
The length of slide on the model is 80cm.
We need to multiply 80cm by 4.

80cm × 4 = ?

Model Multiplication

What if the model was made to a different scale?

Can you calculate the length of the real slides?



1:8 scale. The real slide is 8 times bigger than the model.
The length of slide on the model is 20cm.

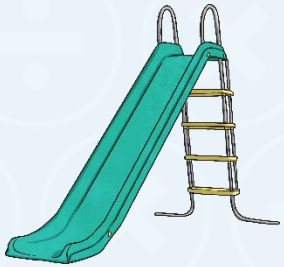
We need to multiply 20cm by ?

20cm × ? = ?

Model Multiplication

What if the model was made to a different scale?

Can you calculate the length of the real slides?



1:10 scale. The real slide is 10 times bigger than the model. The length of slide on the model is 25cm.

We need to multiply 25cm by ?

25cm × ? = ?

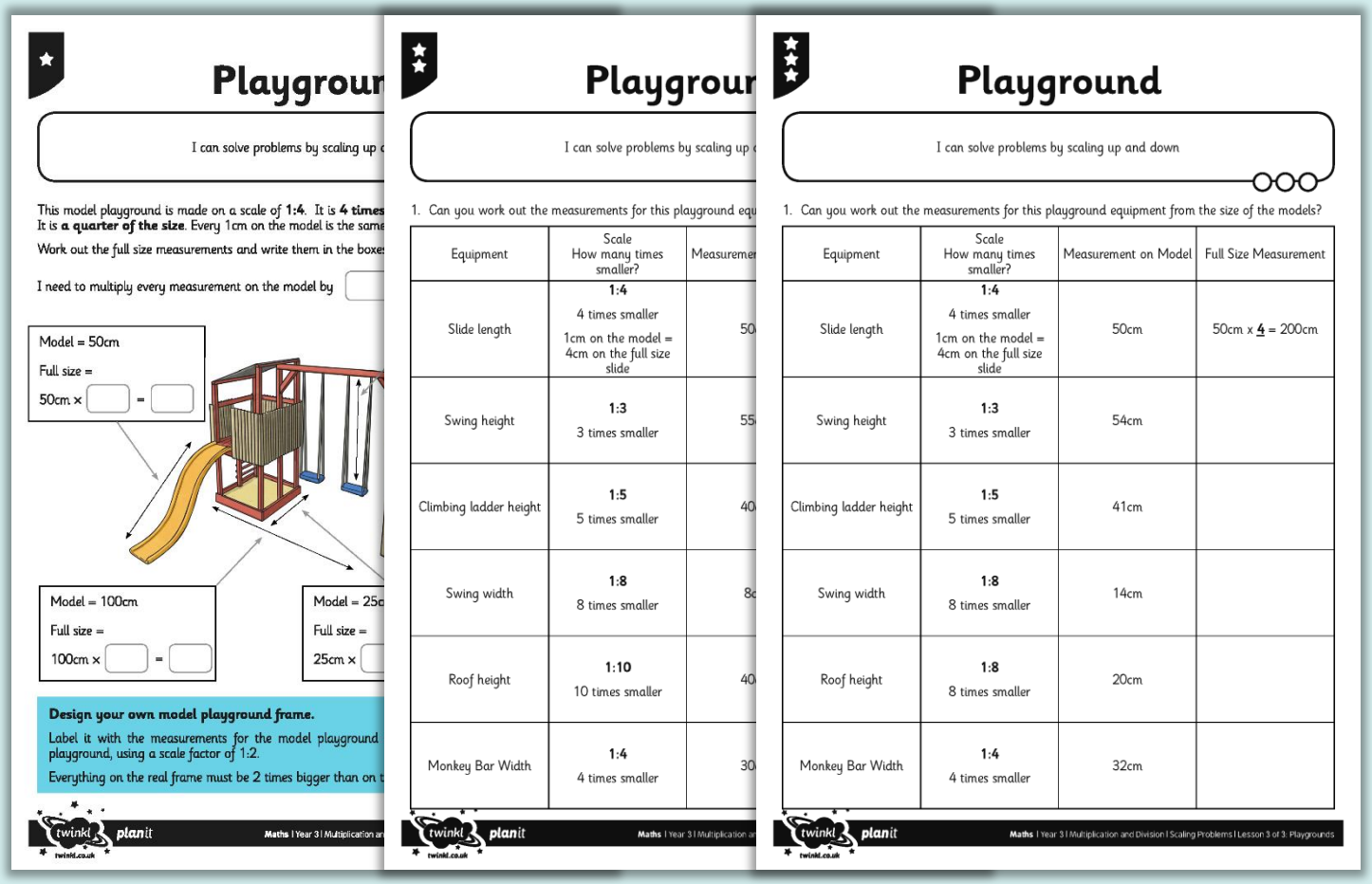
Model Multiplication

The height of this real climbing frame is 400cm at its highest point.

On the model the tallest point of the climbing frame is 40cm.

What scale did they use? How many times bigger is the real playground?

Playgrounds Activity



Playgroun

I can solve problems by scaling up

This model playground is made on a scale of **1:4**. It is **4 times**
It is **a quarter of the size**. Every 1cm on the model is the same

Work out the full size measurements and write them in the boxes

I need to multiply every measurement on the model by

Model = 50cm
Full size =
50cm × =

Model = 100cm
Full size =
100cm × =

Model = 25c
Full size =
25cm ×

Design your own model playground frame.

Label it with the measurements for the model playground
playground, using a scale factor of 1:2.

Everything on the real frame must be 2 times bigger than on t

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Playgroun

I can solve problems by scaling up

1. Can you work out the measurements for this playground equ

Equipment	Scale How many times smaller?	Measuremer
Slide length	**1:4** 4 times smaller 1cm on the model = 4cm on the full size slide	50
Swing height	**1:3** 3 times smaller	55
Climbing ladder height	**1:5** 5 times smaller	40
Swing width	**1:8** 8 times smaller	8
Roof height	**1:10** 10 times smaller	40
Monkey Bar Width	**1:4** 4 times smaller	30

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Playground

I can solve problems by scaling up and down

1. Can you work out the measurements for this playground equipment from the size of the models?

Equipment	Scale How many times smaller?	Measurement on Model	Full Size Measurement
Slide length	**1:4** 4 times smaller 1cm on the model = 4cm on the full size slide	50cm	50cm x 4 = 200cm
Swing height	**1:3** 3 times smaller	54cm	
Climbing ladder height	**1:5** 5 times smaller	41cm	
Swing width	**1:8** 8 times smaller	14cm	
Roof height	**1:8** 8 times smaller	20cm	
Monkey Bar Width	**1:4** 4 times smaller	32cm	

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