Measurement: Miles and Kilometres Reasoning

Aim:	Success Criteria:	Resources:
Convert between miles and kilometres. I can solve reasoning questions involving conversion of miles and kilometres.	I can break down complex problems into smaller steps. I can use mathematical language to explain solutions to problems.	Lesson Pack
	Key/New Words: Convert, measures, length, miles, kilometres.	**Preparation:** Differentiated **Miles and Kilometres Reasoning Activity Sheet** – one per child

Prior Learning: It will be helpful if children have experience of converting between imperial and metric measurements.

Learning Sequence

	Guided Maths Question 1: Use the step-by-step slides on the **Lesson Presentation** to model how to answer a reasoning question based on converting from kilometres to miles.	
	Partner Maths Question 1: The children work in pairs to apply the previous teacher modelling to a similar question displayed on the **Lesson Presentation**, discussing their reasoning. Answer included.	
	Guided Maths Question 2: Use the step-by-step slides on the **Lesson Presentation** to model how to answer a second reasoning question based on solving a problem involving converting from miles to kilometres and rounding the answer.	
	Partner Maths Question 2: The children work in pairs to apply the previous teacher modelling to a similar question displayed on the **Lesson Presentation**, discussing their reasoning. Answer included.	
	Guided Maths Question 3: Use the step-by-step slides on the **Lesson Presentation** to model how to answer a third reasoning question solving a more complex problem converting from miles to kilometres.	
	Partner Maths Question 3: The children work in pairs to apply the previous teacher modelling to a similar question displayed on the **Lesson Presentation**, discussing their reasoning. Answer included.	
	Reasoning Practice: Children complete the **Miles and Kilometres Reasoning Activity Sheet** to show that they solve reasoning questions involving converting between miles and kilometres.	
	Reasoning Answers: Use the slides on the **Lesson Presentation** to discuss the answers to the independent activity questions and self-assess.	

Maths

Measurement

Miles and Kilometres Reasoning

Aim

- I can solve reasoning questions involving conversion of miles and kilometres.

Success Criteria

- I can break down complex problems into smaller steps.

- I can use mathematical language to explain solutions to problems.

Guided Maths Question 1

Read this reasoning question carefully.

Sandi completed the Three Peaks Challenge by walking.

- Her route up and down Ben Nevis was a total of 24km.
- The walk from the bottom to the top of Scafell Pike was 5.5 miles, but she took a quicker route down which was 0.5 miles shorter.
- She walked 7.2km up Snowdon, and the same route back down.

How many miles did Sandi walk altogether?

Let's **highlight** the important information and key vocabulary to show we **understand** the question.

Guided Maths Question 1

Sandi completed the Three Peaks Challenge by walking.

- Her route up and down Ben Nevis was a **total of 24km**.
- The walk from the bottom to the top of Scafell Pike was **5.5 miles**, but she took a quicker route down which was **0.5 miles shorter**.
- She walked **7.2km up** Snowdon, and the **same route back down**.

How many miles did Sandi walk **altogether**?

Next, let's think about what we **already know** in order to help us answer the question correctly.

8km ≈ 5 miles so
24km ≈ 15 miles

7.2km ≈ 4.5 miles

Guided Maths Question 1

Now we are ready to **apply our learning** to solve the question.

Sandi completed the Three Peaks Challenge by walking.
- Her route up and down Ben Nevis was a total of 24km.
- The walk from the bottom to the top of Scafell Pike was 5.5 miles, but she took a quicker route down which was 0.5 miles shorter.
- She walked 7.2km up Snowdon, and the same route back down.

How many miles did Sandi walk altogether?

15 miles +
10.5 miles +
9 miles =
34.5 miles

Guided Maths Question 1

Now we are ready to **apply our learning** to solve the question. ?

Sandi completed the Three Peaks Challenge by walking.

- Her route up and down Ben Nevis was a total of 24km.
- The walk from the bottom to the top of Scafell Pike was 5.5 miles, but she took a quicker route down which was 0.5 miles shorter.
- She walked 7.2km up Snowdon, and the same route back down.

How many miles did Sandi walk altogether?
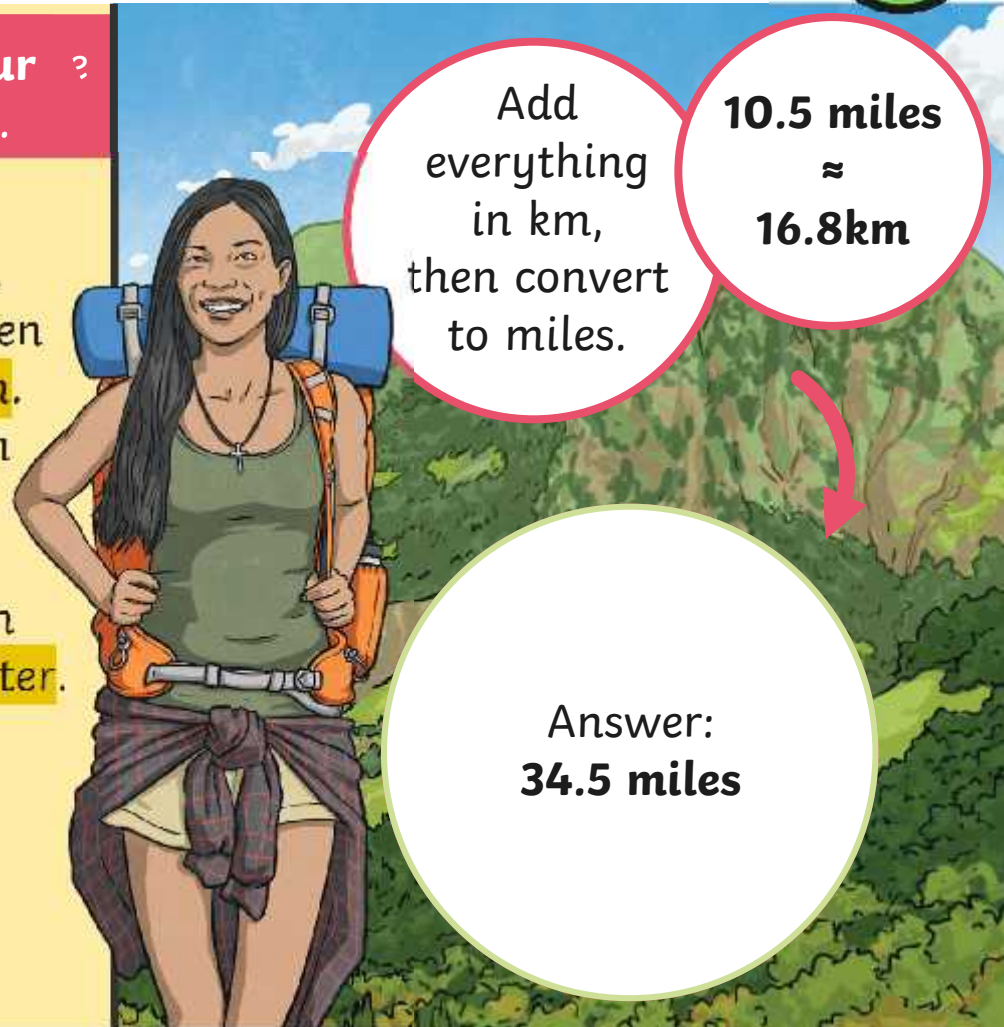
Add everything in km, then convert to miles.

10.5 miles ≈ 16.8km

Answer: **34.5 miles**

Partner Maths Question 1

How many kilometres was Noel's adventure?

Noel completed the Three Peaks Challenge by climbing up the cliffs. After reaching the summit of each mountain, he abseiled down again.

- On day 1, he climbed Ben Nevis. The distance to the top from the car park was 4.5km.
- On day 2, he climbed Scafell Pike, which was a climb of 3.2 miles.
- On day 3, he conquered Snowdon, climbing 5.8 miles.

Answer:
4.5km + 5.12km + 9.28km = **18.9km**

18.9km × 2 = **37.8km**

Working with a partner, use your reasoning skills to answer this question.

Guided Maths Question 2

Read this reasoning question carefully.

The **shortest distance** across the Channel is from Dover to Cap Gris Nez (the headland halfway between Calais and Boulogne). This **distance is 18 miles** (to the nearest whole mile). **Is the distance closest to 28km, 29km or 30km?**
Use the conversion **1 mile ≈ 1.6km**.

Let's **highlight** the important information and key vocabulary to show we **understand** the question.
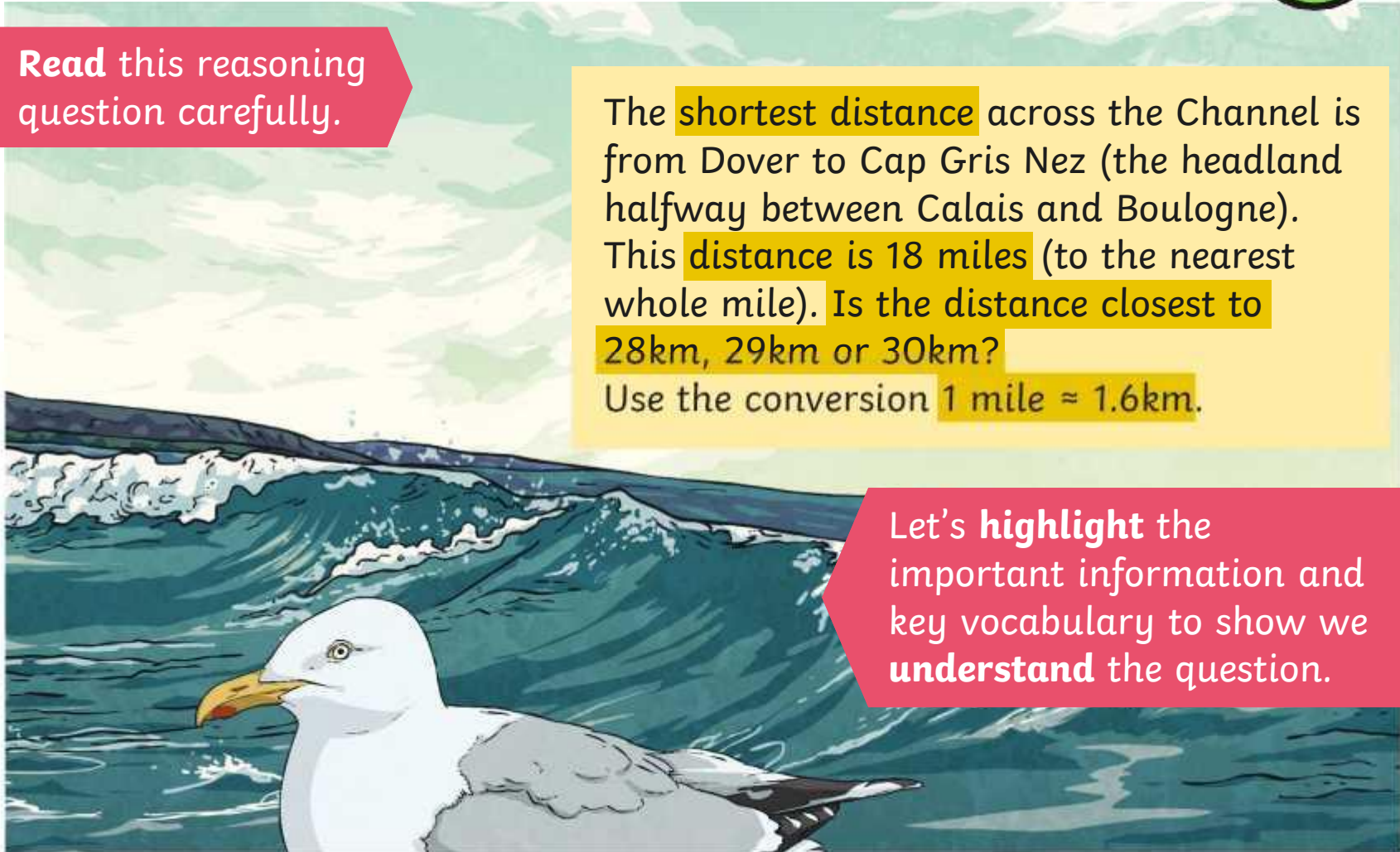
Guided Maths Question 2

Whole Class

Which distance is 28.8km closest to?

... away is ... from ...?

0.8km away from 28km

0.2km away from 29km

1.2km away from 30km

The **shortest distance** across the Channel is from Dover to Cap Gris Nez (the headland halfway between Calais and Boulogne). This **distance is 18 miles** (to the nearest whole mile). **Is the distance closest to 28km, 29km or 30km?** Use the conversion **1 mile ≈ 1.6km.**

18 × 1.6 = 28.8
28.8km

28.8km is closest to **29km**.

Now we are ready to **apply our learning** to solve the question.

Guided Maths Question 2

Let's check the differences by looking at the measurements on a number line, to see how close they are to 28.8km.

The **shortest distance** across the Channel is from Dover to Cap Gris Nez (the headland halfway between Calais and Boulogne). This **distance is 18 miles** (to the nearest whole mile). **Is the distance closest to 28km, 29km or 30km?**
Use the conversion **1 mile ≈ 1.6km.**

Answer:
The distance is closest to **29km**.

0.8   0.2   1.2

28   28.8   29   30
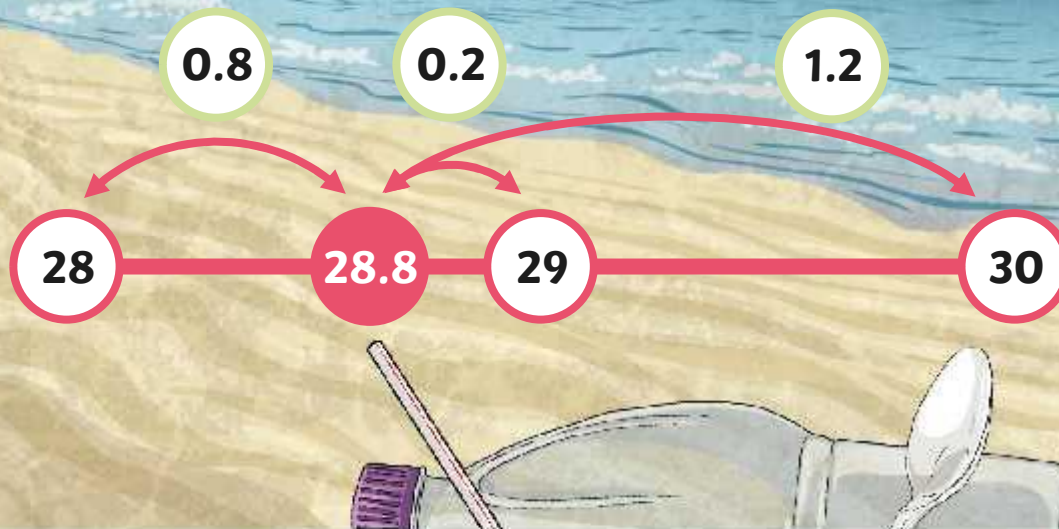
Partner Maths Question 2
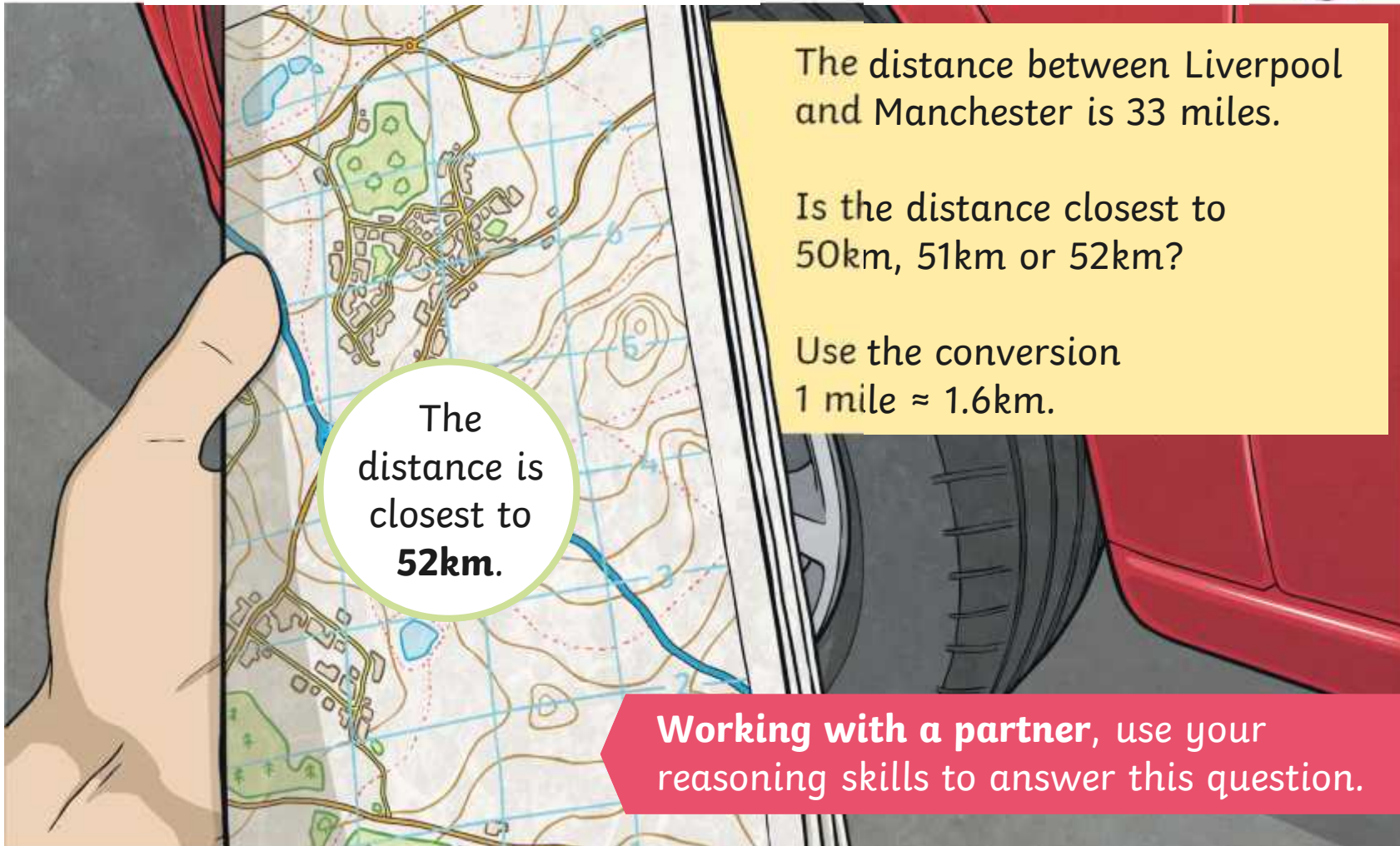
The distance between Liverpool and Manchester is 33 miles.

Is the distance closest to 50km, 51km or 52km?

Use the conversion 1 mile ≈ 1.6km.

The distance is closest to **52km**.

Working with a partner, use your reasoning skills to answer this question.

Guided Maths Question 3

Read this reasoning question carefully.

Let's **highlight** the important information and key vocabulary to show we **understand** the question.

Here is a problem involving converting between miles and kilometres:

It is approximately 300 miles between London and Carlisle. Pauline sets off at 8 a.m. She needs to take a break of 15 minutes after driving for 3 hours.
If she drives at an average of 60km/h, what time should Pauline arrive at Carlisle, taking the breaks she needs?

5 miles ≈ 8km

Guided Maths Question 3

Next, let's think about what we **already know** in order to help us answer the question correctly.

I know that in 5 miles, there are approximately 8km.

Here is a problem involving converting between miles and kilometres:
It is approximately 300 miles between London and Carlisle. Pauline sets off at 8 a.m. She needs to take a break of 15 minutes after driving for 3 hours.
If she drives at an average of 60km/h, what time should Pauline arrive at Carlisle, taking the breaks she needs?

5 miles ≈ 8km

Guided Maths Question 3

Because she has to stop for a 15 minute break after every 3 hours of driving, Pauline will need to take two breaks during her 8-hour journey.

30...
i...
300...
60 ×...

As she is driving...

...ke
...8
...tal
...me.

480 ÷ 60 = 8

Here is a problem involving converting between miles and kilometres:
It is approximately 300 miles between London and Carlisle. Pauline sets off at 8 a.m. She needs to take a break of 15 minutes after driving for 3 hours.
If she drives at an average of 60km/h, what time should Pauline arrive at Carlisle, taking the breaks she needs?

5 miles ≈ 8km

Now we are ready to apply our learning to solve the question.

Guided Maths Question 3

Time	Km Travelled	Journey So Far
8:00 – 11:00	3 × 60km = 180km	180km
11:00 – 11:15	0	180km
11:15 – 14:15	3 × 60km = 180km	360km
14:15 – 14:30	0	360km
14:30 – 16:30	2 × 60km = 120km	480km

Here is a problem involving converting between miles and kilometres:

It is approximately 300 miles between London and Carlisle. Pauline sets off at 8 a.m. She needs to take a break of 15 minutes after driving for 3 hours.

If she drives at an average of 60km/h, what time should Pauline arrive at Carlisle, taking the breaks she needs?

5 miles ≈ 8km

Let's check our answers by completing the task in a different way.

Partner Maths Question 3

Working with a partner, use your reasoning skills to answer this question.

6:30 p.m.

It is approximately 250 miles between Exeter and Manchester. Prue sets off at 10 a.m. She needs to take a break of 15 minutes after driving for 3 hours. If she drives at an average of 50km/h, what time should Prue arrive at Manchester, taking the breaks she needs?
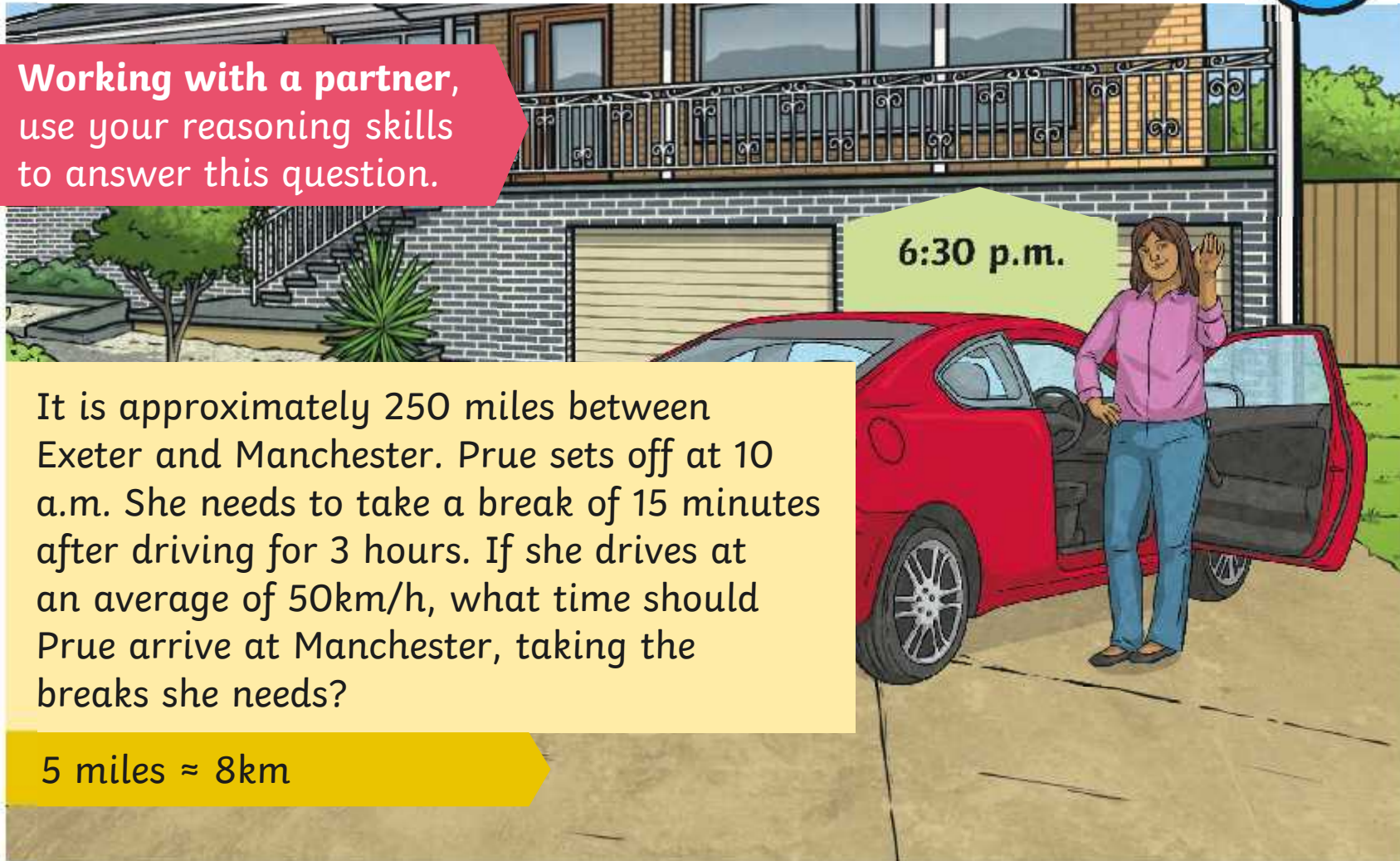
5 miles ≈ 8km

Reasoning Practice

Miles and Kilometres Reasoning

e reasoning questions:

2	3

s just about to start her walk
down Snowdon, which will
m.

ie has walked 16km on Ben Nevis
miles on Scafell Pike.

g will her total walk be in miles?

The distance between Leeds and York is
21 miles.

Is the distance closest to 33km,
34km or 35km?

Use the conversion 1 mile = 1.6km.

It is approximately
London and Chippen
at 9 a.m. She needs t
minutes after driving

If she drives at an average of 40km/h,
what time should she arrive at
Chippenham, taking the breaks she needs?

Use the conversion 5 miles = 8km to work
out the answer.

Class STD
Ticket type ONE WAY
Adult ONE
Child NIL
Number 0142 011472
Start date 3 OCT
Valid until 3 OCT
Price £5.60
From LEEDS
To SHEFFIELD
Route ANY

twinkl Rail

Have a go at **independently** solving the reasoning questions on your activity sheet.

Reasoning Practice Answers

Did you correctly answer the **first** reasoning question?

★	★★	★★★

Helena is just about to start her walk up and down Snowdon, which will be 11.6km.
So far, she has walked 16km on Ben Nevis and 9.5 miles on Scafell Pike.

How long will her total walk be in miles?

26.75 miles

Reasoning Practice Answers

Did you correctly answer the **second** reasoning question?

⭐ | ⭐⭐ | ⭐⭐⭐

The distance between Leeds and York is 21 miles.

Is the distance closest to 33km, 34km or 35km?
Use the conversion 1 mile ≈ 1.6km.

34km

Reasoning Practice Answers

Did you correctly answer the **third** reasoning question?

★	★★	★★★

It is approximately 100 miles between London and Chippenham. Rosie sets off at 9 a.m. She needs to take a break of 15 minutes after driving for 3 hours.

If she drives at an average of 40km/h, what time should she arrive at Chippenham, taking the breaks she needs?

She would arrive in Chippenham
at approximately 1:15 p.m.
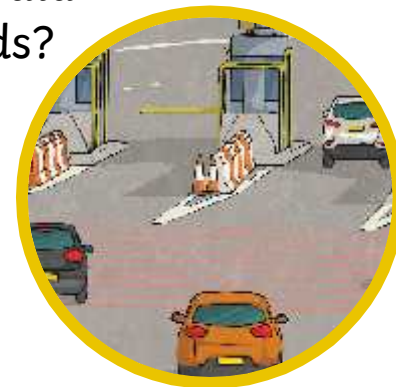
Guided Maths Question 3

How confident do you feel about these types of reasoning question?

Show me using a silent signal:
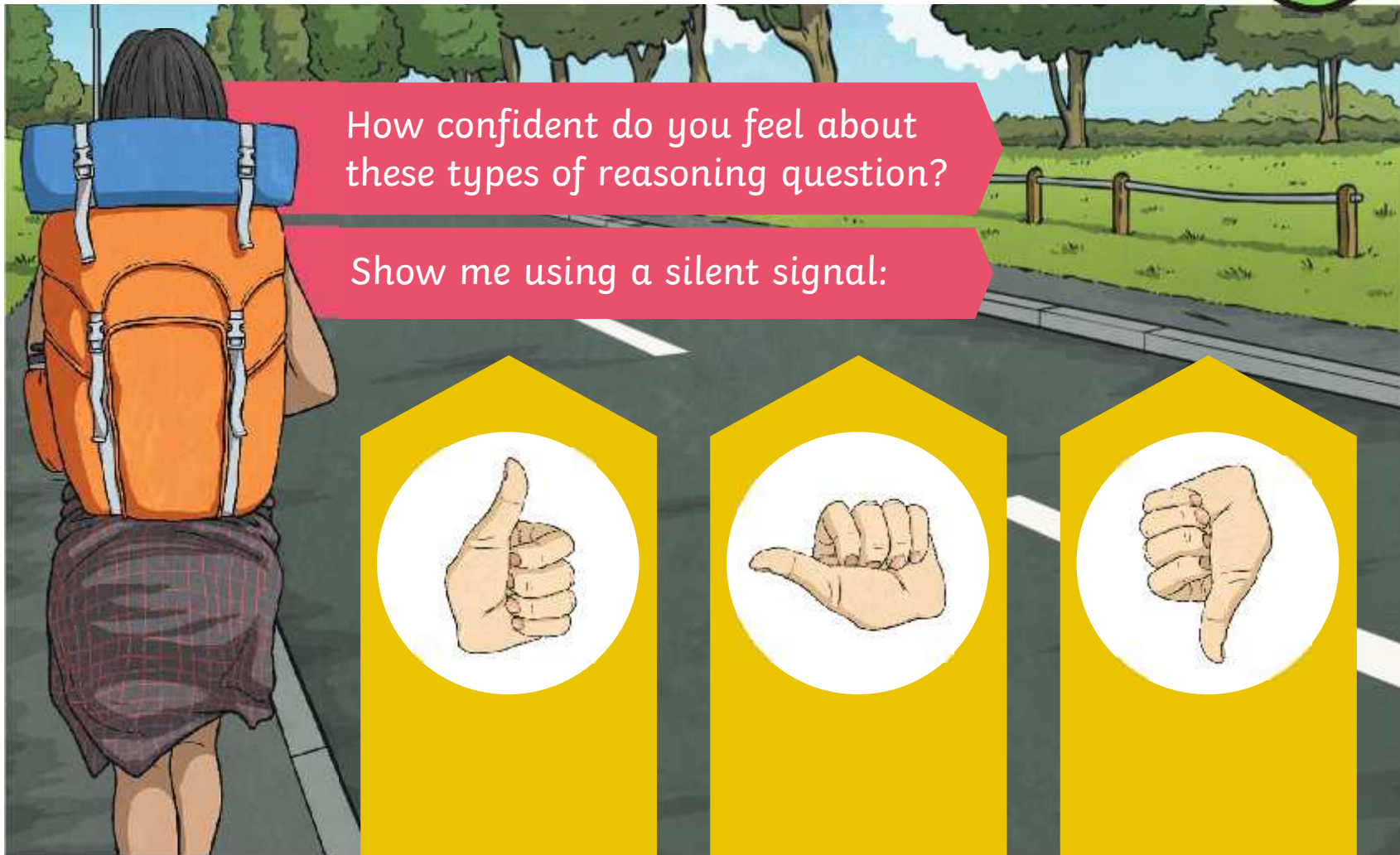
Aim

- I can solve reasoning questions involving conversion of miles and kilometres.

Success Criteria

- I can break down complex problems into smaller steps.
- I can use mathematical language to explain solutions to problems.

Aim: I can solve reasoning questions involving conversion of miles and kilometres.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can break down complex problems into smaller steps.				**Notes/Evidence**					
I can use mathematical language to explain solutions to problems.									

Next Steps

⟩ _____

⟩ _____

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

Aim: I can solve reasoning questions involving conversion of miles and kilometres.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can break down complex problems into smaller steps.				**Notes/Evidence**					
I can use mathematical language to explain solutions to problems.									

Next Steps

⟩ _____

⟩ _____

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

Miles and Kilometres Reasoning

Solve these reasoning questions:

1

Helena is just about to start her walk up and down Snowdon, which will be 11.6km.

So far she has walked 16km on Ben Nevis and 9.5 miles on Scafell Pike.

How long will her total walk be in miles?

2

The distance between Leeds and York is 21 miles.

Is the distance closest to 33km, 34km or 35km?
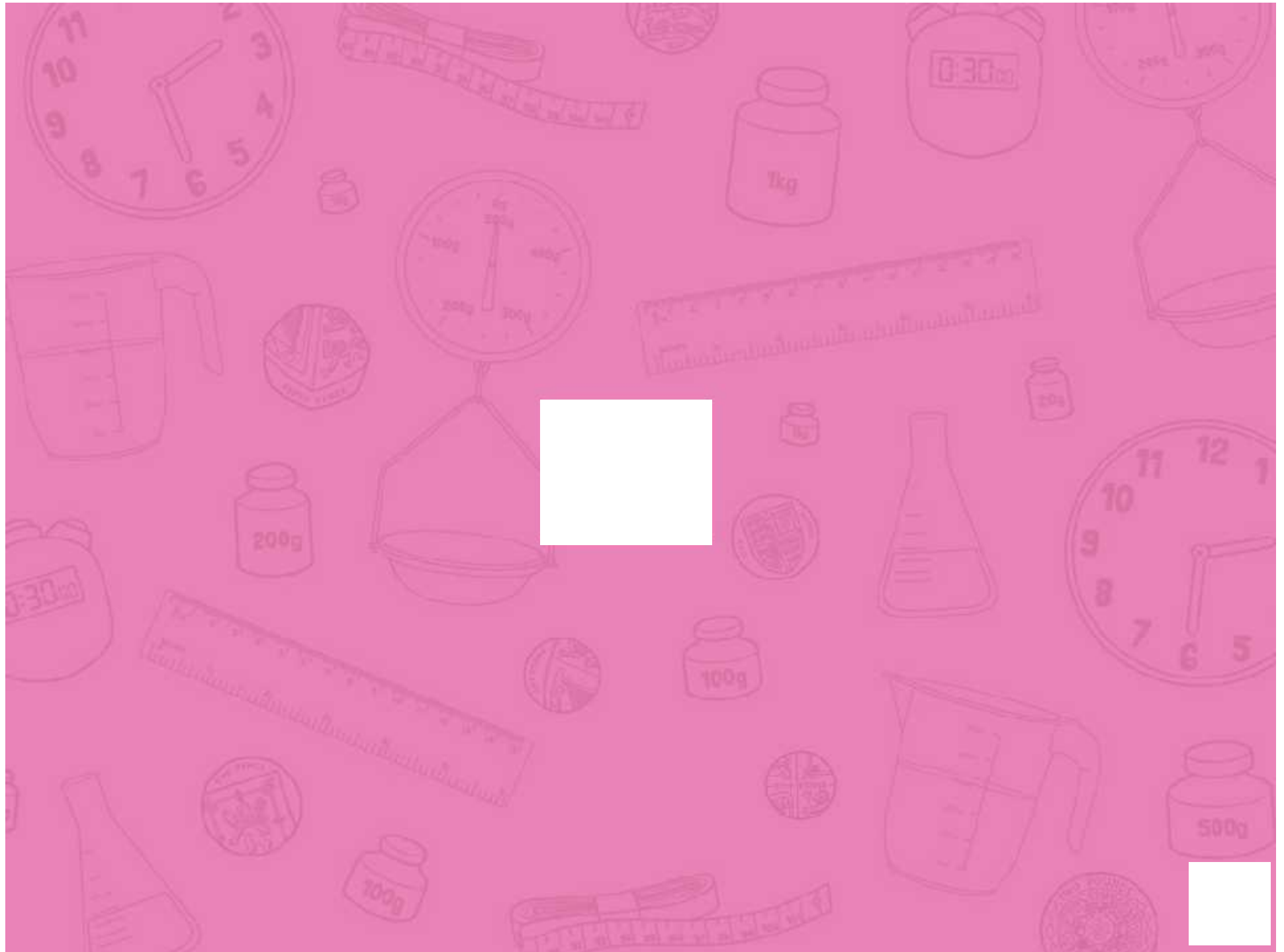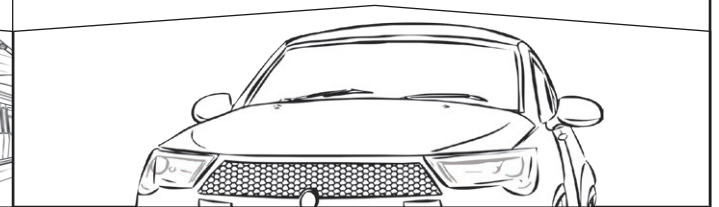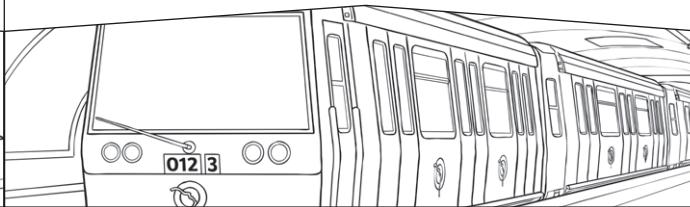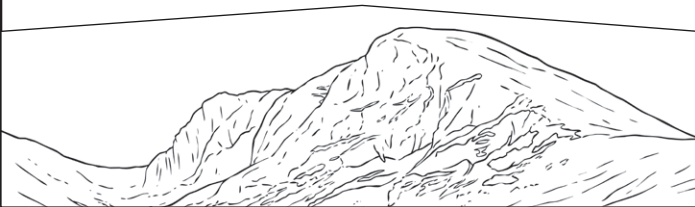
Use the conversion 1 mile ≈ 1.6km.

3

It is approximately 100 miles between London and Chippenham. Rosie sets off at 9 a.m. She needs to take a break of 15 minutes after driving for 3 hours.

If she drives at an average of 40km/h, what time should she arrive at Chippenham, taking the breaks she needs?

Use the conversion 5 miles ≈ 8km to work out the answer.

Miles and Kilometres Reasoning

Solve these reasoning questions:

1

Henry completed the Three Peaks Challenge by climbing up the cliffs. After each mountain, he abseiled down again.

On day 1, he climbed Ben Nevis. The distance from the car park to the top was 4.4km, he took the same route back down.

On day 2, he climbed Scafell Pike, which was a climb of 3 miles each way.

On day 3 he conquered Snowdon, climbing 5.9 miles up and 5.9 miles down.

How many kilometres was Henry's adventure?

2

The distance between Nottingham and Manchester is 83 miles.

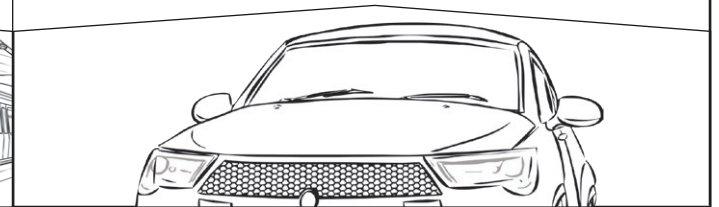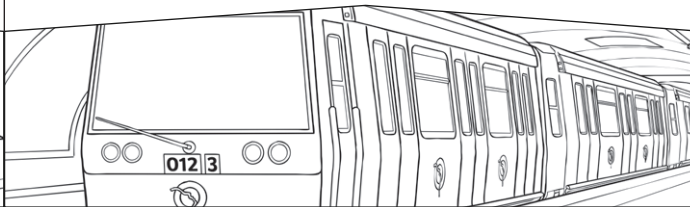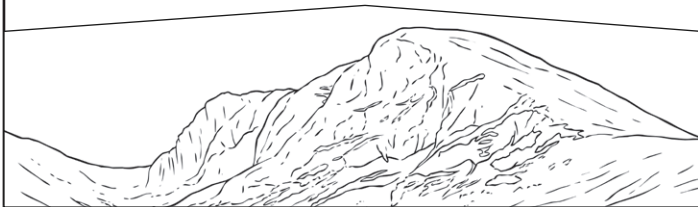Is the distance closest to 130km, 135km or 140km?

Use the conversion 1 mile ≈ 1.6km.

3

It is approximately 450 miles between Exeter and Edinburgh. Amelia sets off at 9 a.m. She needs to take a break of 20 minutes after driving for 3 hours.

If she drives at an average of 60km/h, what time should she arrive at Edinburgh, taking the breaks she needs?

Use the conversion 5 miles ≈ 8km to work out the answer.

Miles and Kilometres Reasoning

Solve these reasoning questions:

1

Priya completed the Three Peaks Challenge by walking.

Her route up and down Ben Nevis was a total of 16km.

The walk from the bottom to the top of Scafell Pike was 4.7 miles, but she took a quicker route down which was 0.9 miles shorter.

She walked 6.7km up Snowdon and the same route back down.

How many miles did Priya walk altogether?

2

The distance between Birmingham and Oldham is 97 miles.

Is the distance closest to 156km, 157km or 158km?

Use the conversion 1 mile ≈ 1.6km.

3

It is approximately 275 miles between London and Newcastle. Steph sets off at 9 a.m. She needs to take a break of 15 minutes after driving for 3 hours.

If she drives at an average of 60km/h, what time should she arrive at Newcastle, taking the breaks she needs?

Use the conversion 5 miles ≈ 8km to work out the answer.
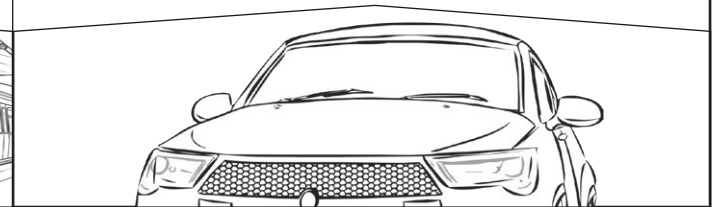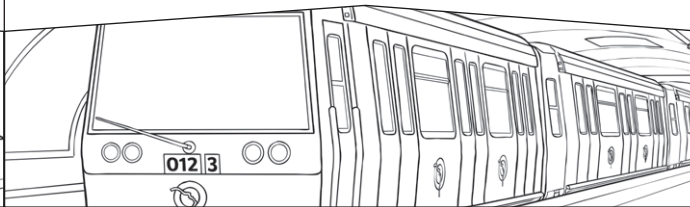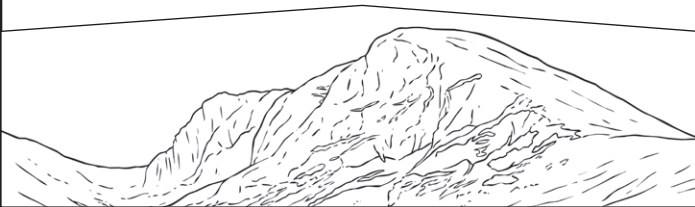
Miles and Kilometres Reasoning **Answers**

★	
1	26.75 miles
2	34km
3	She would arrive in Chippenham at approximately 1:15 p.m.

★★★	
1	26.875 miles
2	156km
3	She would arrive in Newcastle at approximately 4:50 p.m.

★★	
1	37.28km
2	135km
3	She would arrive in Edinburgh at approximately 10 p.m.

Measurement | Miles and Kilometres Reasoning

I can solve reasoning questions involving conversion of miles and kilometres.		
I can break down complex problems into smaller steps.		
I can use mathematical language to explain solutions to problems.		

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Maths I Year 6 I Measurement I Converting Between Miles and Kilometres I Lesson 3 of 3: Miles and Kilometres Reasoning

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