# Unit 13
# Mass

**Mastery Expert tip!** "Throughout this unit, make sure you do lots of practical weighing and measuring. This hands-on learning is vital to achieve mastery!"

**Don't forget to watch the Unit 13 video!**

## WHY THIS UNIT IS IMPORTANT

This unit is important because it strengthens children's knowledge of mass: an important area of learning which has many real-life applications.

First, children will learn how to measure and read a scale, focusing upon unmarked intervals. Next, different masses will be compared and ordered. Following this, children will learn to add and subtract different amounts, using a range of strategies. Finally, they will apply their knowledge to real-life problems – an important skill for children to learn in order to work towards mastery.

## WHERE THIS UNIT FITS

- Unit 12 – Angles and properties of shapes
- **Unit 13 – Mass**
- Unit 14 – Capacity

This unit involves the application of skills such as addition and subtraction in a measures context. Children will have covered these strategies in Key Stage 1, and in previous Year 3 units, but will require support when applying them. Measures were covered in Year 2 Unit 14, in which weight, volume and temperature were the focus.

Before they start this unit, it is expected that children:

- can use scales to compare, estimate and measure the mass of an object
- are able to measure mass in grams and kilograms
- can count in hundreds to link grams to kilograms.

## ASSESSING MASTERY

Children who have mastered this unit will be able to read scales accurately, including when there are missing intervals. Children should also be able to apply their understanding to solve problems involving mass. Finally, ideas and methods will be explained effectively, using the correct mathematical vocabulary and representations.

| COMMON MISCONCEPTIONS | STRENGTHENING UNDERSTANDING | GOING DEEPER |
|---|---|---|
| Children may confuse grams and kilograms and not add them up separately, or convert once they meet the 1,000 g barrier. | Use place value counters to represent different amounts. | Solve problems involving grams and kilograms, in which children must convert the amounts.<br>Challenge children to find midpoints between two intervals.<br>Provide children with some multi-step word problems. Can they explain their steps and solutions? |
| Children may work out missing intervals incorrectly or think you cannot find a value between masses such as 1 kg and 2 kg. | Practice weighing objects on a range of scales. | |
| Children may solve problems incorrectly, applying the wrong calculations through misinterpretation. | Ask children to represent calculations in a bar model or use the column method. | |

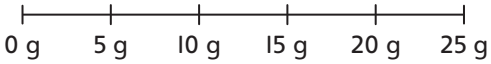
# Unit 13: Mass

## WAYS OF WORKING

Use these pages to introduce the unit focus to children. Talk through the key learning points that the characters mention and the key vocabulary.

## STRUCTURES AND REPRESENTATIONS

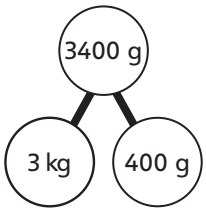
**Number line:** The number line is effective when looking at scales and finding missing intervals. Children can count on and back too.




**Bar model:** The bar model helps children gain a visual understanding of word problems involving measures.

| 1 kg 500 g | |
|---|---|
| 1 kg 300 g | 200 g |

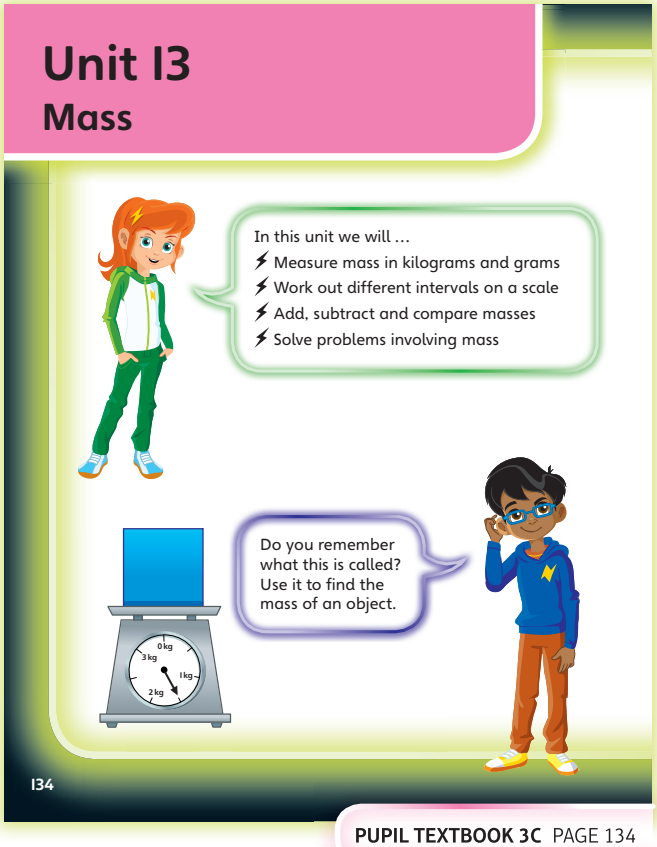
**Part-whole models:** The part-whole model allows children to convert between units of measure effectively.




## KEY LANGUAGE

There is some key language that children will need to know as part of the learning in this unit:

- mass, weigh, measure, grams (g), kilograms (kg)
- interval, scale

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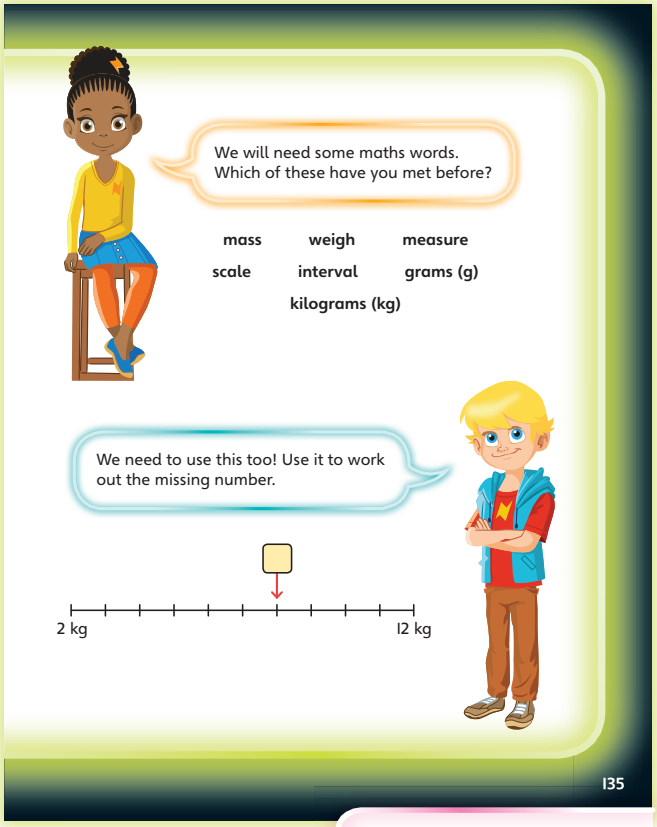


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# Measuring mass 1

## Learning focus

In this lesson, children will learn how to read a range of scales relating to mass, including those with missing intervals.

## Small steps

- Previous step: Constructing 3D shapes
- **This step: Measuring mass (1)**
- Next step: Measuring mass (2)

## NATIONAL CURRICULUM LINKS

**Year 3 Measurement**

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

## ASSESSING MASTERY

Children can read scales quickly, using the correct method to find a missing interval. Furthermore, they will show a strong understanding of grams and kilograms.

## COMMON MISCONCEPTIONS

Children may make errors when working out a missing interval. Ask:

- *What is the method you use to work out a missing interval?*

Children may not understand the value of grams and kilograms. Ask:

- *How many grams are in a kilogram? Can you think of something that weighs 1 gram and 1 kilogram?*

## STRENGTHENING UNDERSTANDING

Children may need support when finding missing intervals. Ask children to provide missing interval questions for a partner and to explain the method they followed to find each answer. Summarise the correct methods at the end as a group.

Children may need support when finding the difference between intervals or when dividing. Use number lines to support learning.

## GOING DEEPER

Go deeper by doing some practical activities such as weighing balls of modelling clay on scales. Experiment with balls and parachutes: find out what happens when different masses are attached to the parachutes.

Give children a range of misread intervals. Ask them to reason why the mistakes were made.

## KEY LANGUAGE

**In lesson:** mass, measure, interval, grams (g), kilograms (kg), scale

**Other language to be used by the teacher:** difference, divide, dial

## STRUCTURES AND REPRESENTATIONS

number line

## RESOURCES

**Mandatory:** weighing scales, modelling clay

**Optional:** number lines, parachute

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

## Before you teach

- What did children cover in mass in Year 2?
- Are all children able to find differences?
- Do children have division strategies they can use?

# Discover

**WAYS OF WORKING** Pair work

**ASK**

- Question 1 a): *What method did you use to work out the value of each interval?*
- Question 1 b): *What method did you use?*
- Question 1 b): *How can you check your answer is correct?*

**IN FOCUS** This question really gets children thinking about the missing intervals on scales. Encourage them to come up with step-by-step instructions to explain how to work them out.

**PRACTICAL TIPS** Give children dial scales and modelling clay, so they can measure mass in a practical context.

**ANSWERS**

Question 1 a): To work out what each interval represents, the steps are:
- Find the difference between the two marked amounts.
- Count the number of intervals.
- Divide the difference by this number.

Question 1 b): 20 g, 130 g, 600 g.


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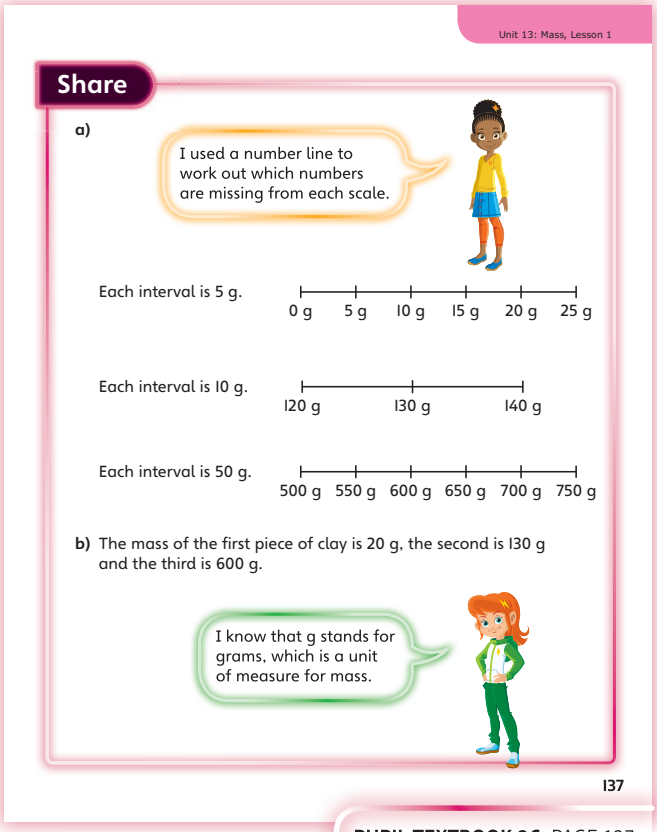
# Share

**WAYS OF WORKING** Whole class teacher led

**ASK**

- Question 1 a): *What does interval mean?*
- Question 1 a): *Let's say the three steps aloud as a class. Does this method match the one you used to solve the problem?*

**IN FOCUS** Children will be reminded that 1,000 g equals 1 kg. This is a good opportunity to reinforce this knowledge. Ask: *What is 2 kg in grams? How about 5 kg? 8 kg?*

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# Think together

**WAYS OF WORKING** Whole class teacher led (I do, We do, You do)

**ASK**

- Question 2 : *How did you find the missing interval?*
- Question 2 : *Is there a representation that would help?*

**IN FOCUS** Question 2 a) shows intervals of 250 g. This may prove a challenge for some children. Ask children to think of an effective strategy to work out what the interval is. Some may see that there is a half-way mark, which has to be 500 g. Children can then halve again to find 250 g.

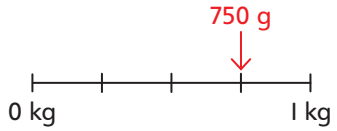
**STRENGTHEN** Children will benefit from counting practice. Count in 5s, 10s, 20s, 25s, 50s and 100s.

**ASSESSMENT CHECKPOINT** Question 1 will allow you to assess whether children can interpret and read the scales. Look for children who can confidently work out intervals on scales and explain their methodology.

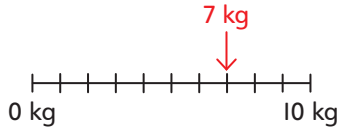
**ANSWERS**

Question 1 : 225 g, 375 g, 450 g

Question 2 a):

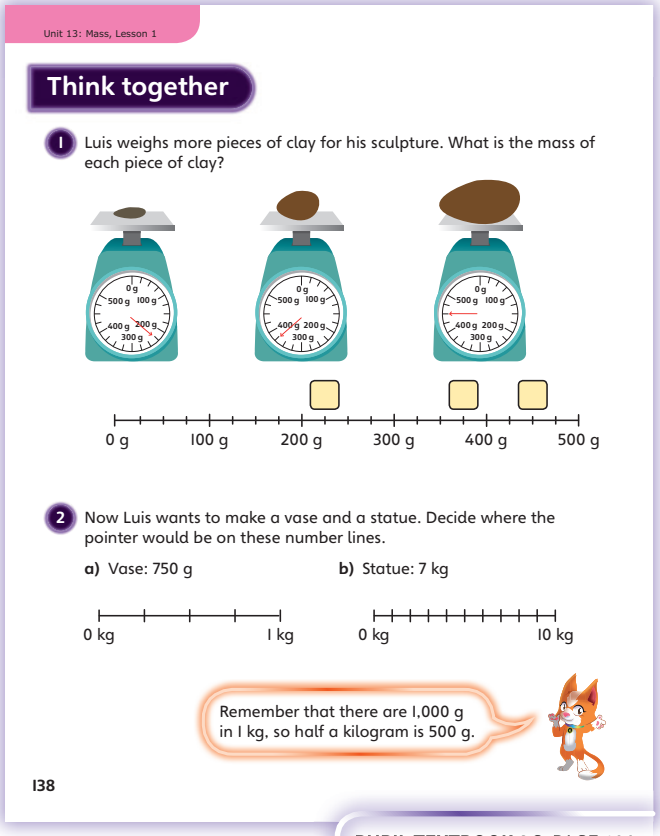



Question 2 b):




Questions 3 a) and b):

| Objects you would measure in grams | Objects you would measure in kilograms |
|---|---|
| pen (6 g) | table (50 kg) |
| T-shirt (120 g / 140 g) | bicycle (10 kg) |
| ring (6 g) | suitcase (3 kg) |
| spoon (25 g) | |
| mobile phone (120 g / 140 g) | |

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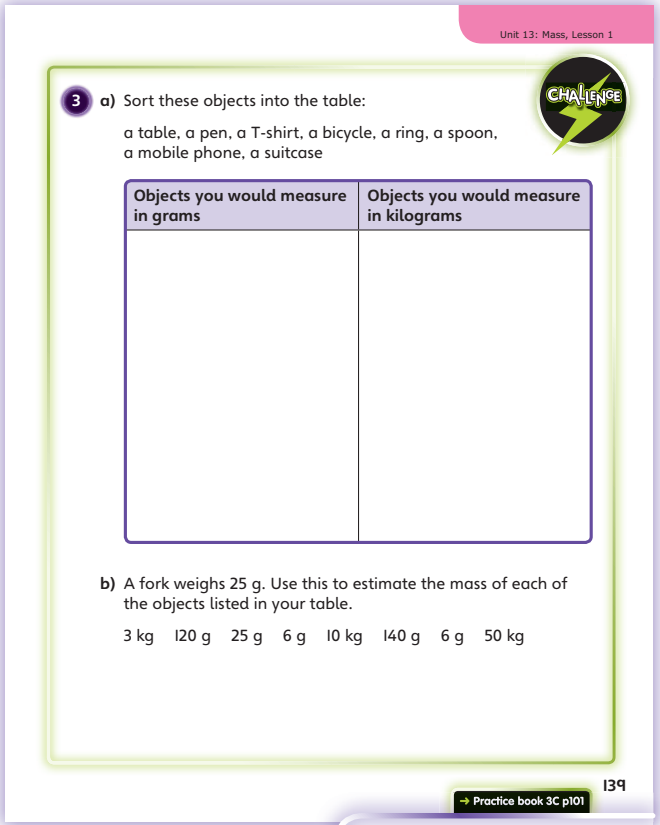


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## Practice

**WAYS OF WORKING** Independent thinking

**IN FOCUS** Question 2 will involve children reasoning, using their knowledge of grams and kilograms. Encourage them to be clear with their answers, and to use the correct vocabulary.

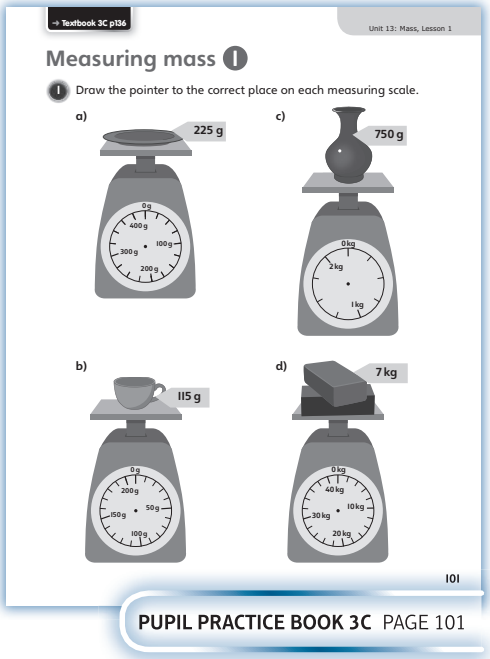
**STRENGTHEN** To support understanding in this section, give children similar problems to those in the first question. Use number lines, which will help children break down the scales and intervals.

**DEEPEN** Ask children to find things around the classroom and calculate their mass using scales. You could have different scales with different intervals, so they see the difference when the same object is weighed on different scales.

**THINK DIFFERENTLY** Question 3 will require children to first find the correct answer and then explain where Andy went wrong in the example.

**ASSESSMENT CHECKPOINT** Question 4 is an effective way to see if children can relate masses to real-life objects. Assess children on whether they have an understanding of mass in situations such as food labels or weighing fruit in a supermarket.

**ANSWERS** Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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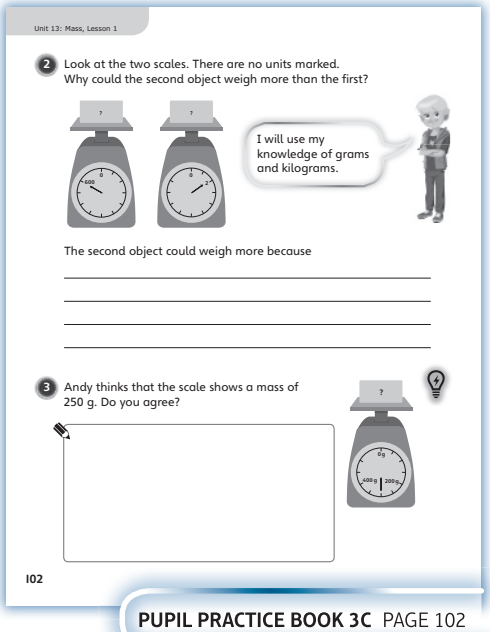


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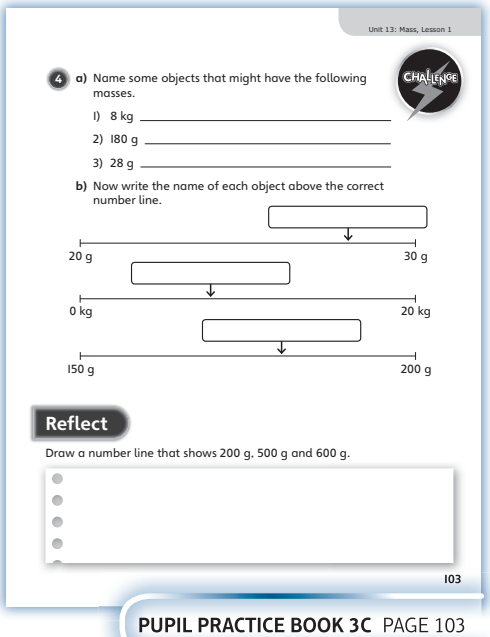
## Reflect

**WAYS OF WORKING** Independent thinking

**IN FOCUS** This question gives children the opportunity to draw and label their own number line in order to understand the intervals on a scale.

**ASSESSMENT CHECKPOINT** This will allow you to assess children's understanding of using number lines to work out missing intervals.

**ANSWERS** Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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## After the lesson

- Do any children need more practice with reading scales?
- Can children count in 5s, 10s, 20s, 25s, 50s and 100s?

# Measuring mass 2

## Learning focus

In this lesson children will learn how to read a range of scales in which kg and g are mixed. They will also find midpoints between intervals.

## Small steps

- Previous step: Measuring mass (1)
- **This step: Measuring mass (2)**
- Next step: Measuring mass (3)

## NATIONAL CURRICULUM LINKS

**Year 3 Measurement**

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

## ASSESSING MASTERY

Children can understand the values of grams and kilograms. Children can represent values using place value counters and work out missing intervals using number lines.

## COMMON MISCONCEPTIONS

Children may think that you cannot find anything between values such as 3 kg and 4 kg, because there are no whole numbers between them. Ask:

- *Is there a smaller unit you could use?*

Children may mix up grams and kilograms. Ask:

- *Which is larger? Which should you write first in your answer – the grams or kilograms?*

## STRENGTHENING UNDERSTANDING

Children may need support when finding missing intervals between values such as 3 kg and 4 kg. Show them on a number line and practise counting in 100s, 200s and 500s.

You may also want to represent kilograms with weights (place value counters would also work), asking children to find different ways to make them; for example 10 × 100 g = 1 kg.

## GOING DEEPER

Go deeper by asking children to find midpoints between intervals. This will call on children's knowledge of finding the values of the intervals and then finding half-way points between two of them.

You may want to continue doing some practical activities such as weighing balls of modelling clay on scales.

## KEY LANGUAGE

**In lesson:** mass, measure, scale, interval, grams (g), kilograms (kg),

**Other language to be used by teacher:** midpoint, difference, divide, dial

## STRUCTURES AND REPRESENTATIONS

number line

## RESOURCES

**Mandatory:** weighing scales, modelling clay

**Optional:** number lines, place value counters

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

## Before you teach

- Are children confident in measuring grams and kilograms separately?
- How can any common misconceptions from Lesson 1 be addressed in this lesson?

# Discover

**WAYS OF WORKING** Pair work

**ASK**

- Question 1 a): *Do you need to focus on the kilograms or grams to work out the answer?*
- Questions 1 a) and b): *Could you use a smaller unit to help you?*

**IN FOCUS** Question 1 b) will require some deeper thinking from children. Expect to hear some children saying the answer is 6 $\frac{1}{2}$ kg or 6 $\frac{3}{4}$ kg (children are likely to call on their knowledge of basic fractions). Focus learning by asking children if there is a smaller unit they could use.

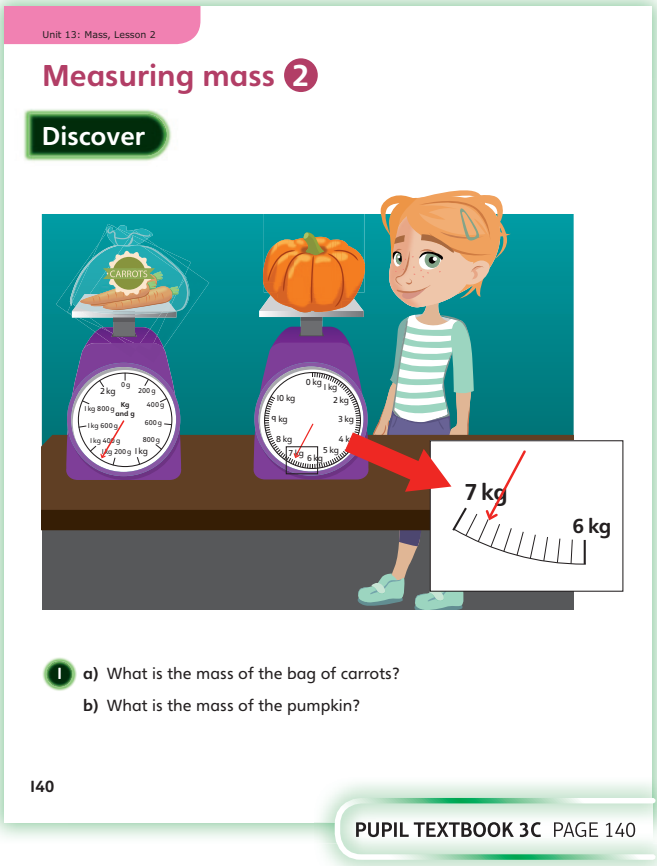
**PRACTICAL TIPS** Explain the method for working out missing intervals and display the three steps on your maths learning wall: find the difference between the two amounts; count the number of intervals; divide the difference by the number of intervals.

Use number lines to help children count the value of grams between two 1 kg points. Use place value counters to help children visualise 100 and 1,000 values together.

**ANSWERS**

Question 1 a): The mass of the bag of carrots is 1 kg 300 g.

Question 1 b): There are 1,000 g in 1 kg; there are 10 intervals on the scale.
1,000 divided by 10 is 100; so each interval is 100 g.
The mass of the pumpkin is 6 kg 800 g.


Unit 13: Mass, Lesson 2

Measuring mass 2

Discover



1 a) What is the mass of the bag of carrots?

b) What is the mass of the pumpkin?

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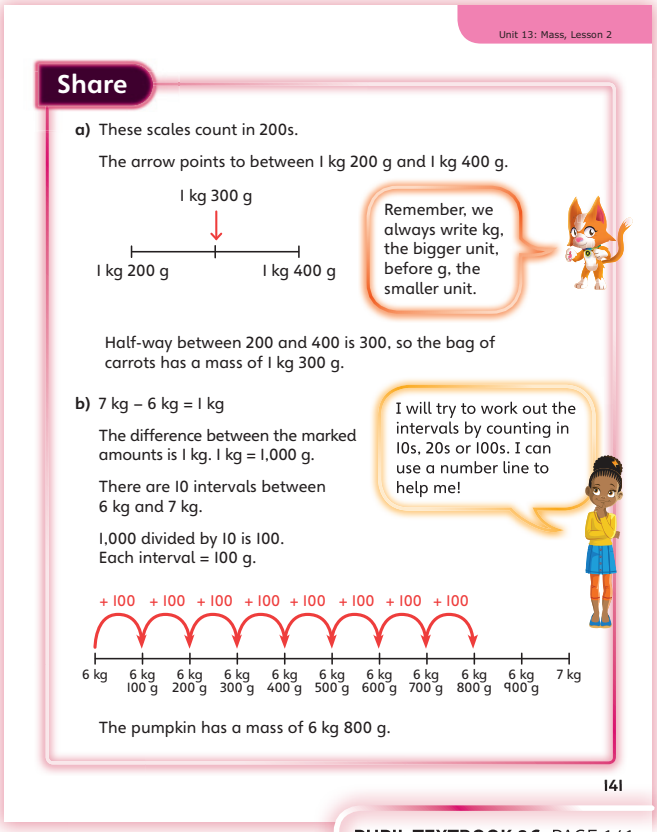
# Share

**WAYS OF WORKING** Whole class teacher led

**ASK**

- Question 1 a): *Can you count aloud in steps of 100 g? What happens when you get to 900 g?*
- Question 1 b): *What does interval mean?*
- Question 1 b): *Let's say the three steps aloud as a class. How could you use a number line to solve question 1 b)?*

**IN FOCUS** Question 1 introduces children to working with mixed grams and kilograms. This helps them to recognise and record mass value within the context of weighing different objects. Help children by modelling how different amounts can be represented: use weights or place value counters on a part-whole model to help with this.


Unit 13: Mass, Lesson 2

Share

a) These scales count in 200s.

The arrow points to between 1 kg 200 g and 1 kg 400 g.



Remember, we always write kg, the bigger unit, before g, the smaller unit.

Half-way between 200 and 400 is 300, so the bag of carrots has a mass of 1 kg 300 g.

b) 7 kg – 6 kg = 1 kg

The difference between the marked amounts is 1 kg. 1 kg = 1,000 g.

There are 10 intervals between 6 kg and 7 kg.

1,000 divided by 10 is 100.
Each interval = 100 g.

I will try to work out the intervals by counting in 10s, 20s or 100s. I can use a number line to help me!



The pumpkin has a mass of 6 kg 800 g.

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# Think together

**WAYS OF WORKING** Whole class teacher led (I do, We do, You do)

**ASK**

- Question 2: *Can you count the intervals first?*
- Question 3: *How can you work out the midpoint? What calculation do you need to do?*

**IN FOCUS** Question 2 shows the same amount represented on two different scales. Make learning real here by showing children that this happens in real life: not every scale is the same. You could do some practical measuring using a range of scales.

**STRENGTHEN** Ask children to count in 5s, 10s, 20s, 25s, 50s, 100s, 200s and 250s up to and past 1 kg. First count in grams (for example, 800 g, 900 g, 1,000 g, 1,100 g, 1,200 g); then count in mixed grams and kilograms (for example, 800 g, 900 g, 1 kg, 1 kg 100 g, 1 kg 200 g).

For question 3, support children by asking them to find midpoints. This will require them to:

- find the interval value;
- find half of the interval value;
- add it on to the previous interval value.

**DEEPEN** For question 3, children will have to find midpoints between marked intervals. This will certainly deepen learning in this lesson. Ask children to explain their methods clearly. Can they explain their methods? Show them that they must find the difference between the intervals, halve the amount and then add this onto the previous interval.

**ASSESSMENT CHECKPOINT** Use question 1 to assess whether children notice that the number of intervals are different on each scale. Listen carefully to their explanations and how they work each mass out.

**ANSWERS**

Question 1 a): The onions have a mass of 3 kg 400 g.

Question 1 b): The peas have a mass of 400 g.

Question 2 a): The mass of the bag of potatoes is 1 kg 500 g.

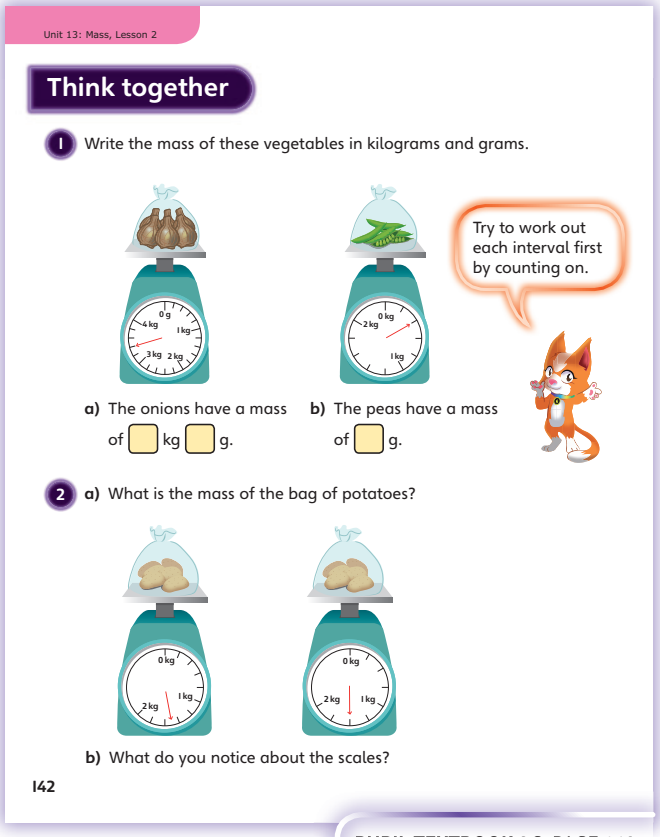
Question 2 b): Each scale has a different number of intervals between the marked amounts: on the first scale each interval represents 200 g; on the second, each interval represents 250 g.

Question 3 a): 4 kg 700 g

Question 3 b): 4 kg 500 g

Question 3 c): 1 kg 950 g

Question 3 d): 10 kg 875 g

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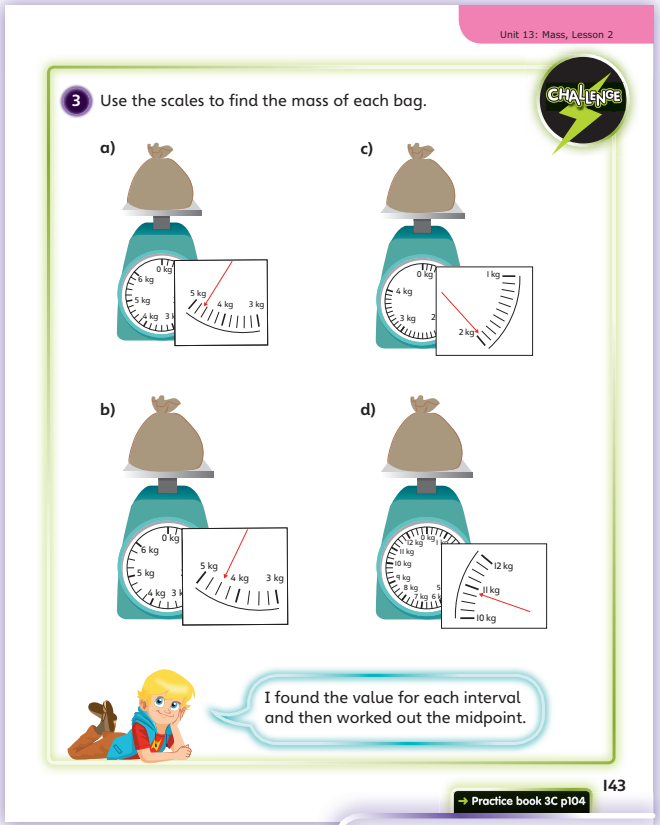


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## Practice

**WAYS OF WORKING** Independent thinking

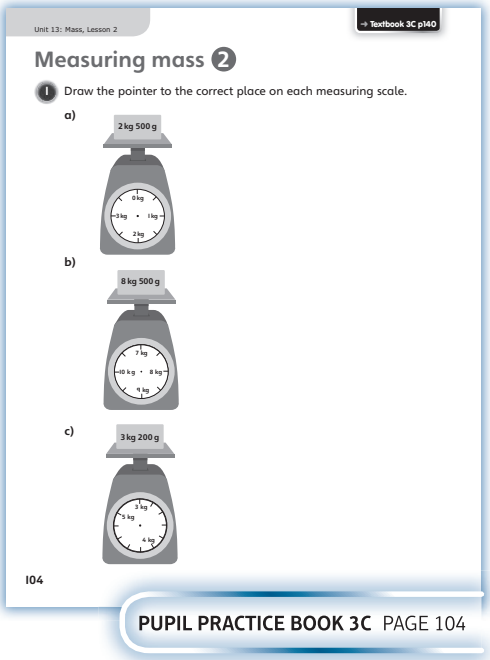
**IN FOCUS** Questions 1 and 2 allow children to practise reading different scales. Question 3 allows children to focus their learning by estimating answers on scales without interval lines. If children need support with question 3, suggest that they mark the half-way point; then the quarter-way and three-quarter-way points.

**STRENGTHEN** Ask children to work out the answers and then check these by counting around the scale in the interval value they have worked out. For instance, in question 1, children may find that the first scale has intervals of 500 g. Ask children to point to each interval and count around in 500s until they get to the answer. Use number lines or counters for support.

**DEEPEN** Question 3 is a great activity for deepening learning; in this question, children are required to estimate amounts on a number line. After children have completed their answers, ask them if there are any other possibilities. This will deepen learning as they are applying knowledge of measure whilst using their estimation skills. Question 4 challenges children to explore mass between whole kilograms as a word problem.

**ASSESSMENT CHECKPOINT** Questions 1 and 2 will allow you to see which children can read scales confidently, working out midpoints. For a more thorough assessment, ask children to explain why they matched each scale to the mass it shows.

**ANSWERS** Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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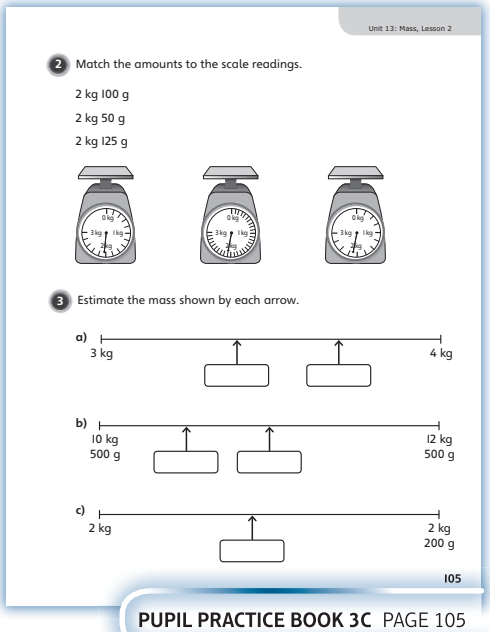


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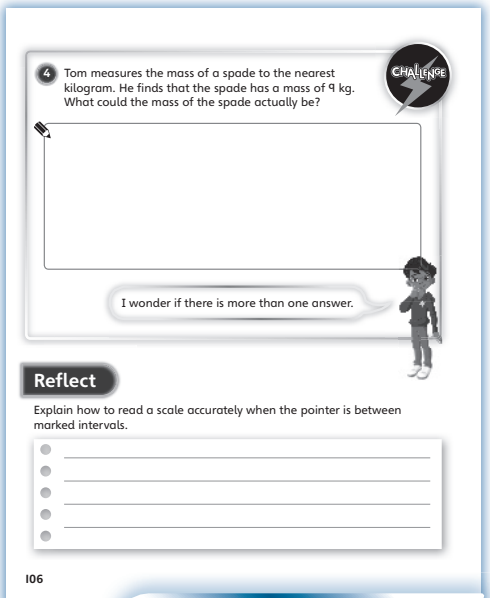
## Reflect

**WAYS OF WORKING** Independent thinking

**IN FOCUS** In this activity, encourage children to write their explanation in clear steps.

**ASSESSMENT CHECKPOINT** This will allow you to assess whether children can successfully find midpoints between intervals.

**ANSWERS** Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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## After the lesson

- Are children secure at working with grams and kilograms together to find a mass value?
- How can you provide opportunities for children to further their skills at reading mass values on different scales, across the curriculum?

# Measuring mass 3

## Learning focus

In this lesson, children will learn how to convert amounts in grams to values in both kilograms and grams.

## Small steps

- Previous step: Measuring mass (2)
- **This step: Measuring mass (3)**
- Next step: Comparing masses

### NATIONAL CURRICULUM LINKS

**Year 3 Measurement**

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

### ASSESSING MASTERY

Children can quickly convert and represent the amounts using representations such as the part-whole model. Children have a solid understanding of place value, and confidently convert amounts such as 1,009 g.

### COMMON MISCONCEPTIONS

Children may have some place value misconceptions; for example, thinking 2,011 g = 2 kg 110 g. Ask:

- *Can you represent the amount using the weights (1 kg, 100 g, 10 g, 1 g), or place value counters?*

Some children may not be confident with using 0 as a place holder. Ask:

- *Why do you need to include a 0 in 1,022 g?*

### STRENGTHENING UNDERSTANDING

Children may need reminding that 1 kg = 1,000 g (it would be useful to display this fact on a learning wall).

Provide children with a range of weights, so they can represent amounts with them and support their conversion mastery.

### GOING DEEPER

Go deeper by asking children to represent amounts in different ways. For example: 1,340 g could be: 1 kg + 300 g + 40 g; or 1 kg + 100 g + 100 g + 100 g + 10 g + 10 g + 10 g + 10 g.

### KEY LANGUAGE

**In lesson:** mass, measure, scale, grams (g), kilograms (kg)

**Other language used by the teacher:** interval, difference, divide, dial, balance

### STRUCTURES AND REPRESENTATIONS

number line, place value counters, part-whole model

### RESOURCES

**Mandatory:** weighing scales, weights

**Optional:** modelling clay, number lines

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

## Before you teach

- Do all children know that 1 kg = 1,000 g?
- Could conversion examples be made into a display?
- Have you got some weights ready for practical work?

# Discover

**WAYS OF WORKING** Pair work

**ASK**

- Question 1 a): *Can you point to the thousands digit in 3,400 g and 3,500 g?*
- Question 1 a): *How could you write your answer?*
- Question 1 b): *How can you work out what each interval is worth?*

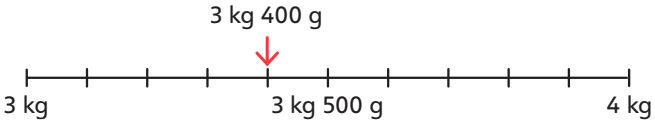
**IN FOCUS** Question 1 a) introduces children to converting between grams and kilograms. Encourage children to recall the fact that 1 kg = 1,000 g. See if children can identify which digit represents each 1,000 g: they can do this by pointing to the 3 in 3,400 g. Look at the balance together and encourage children to add the kilograms and grams separately. Children should spot that 3,400 g is equal to 3 kg 400 g.

**PRACTICAL TIPS** For this activity, display some conversions on your learning wall, so children have a reference. This will help to scaffold learning. Part-whole models work well when separating larger amounts into grams and kilograms.

**ANSWERS**

Question 1 a): The mass of the bike is 3 kg 400 g; Bella's guess is correct.

Question 1 b):





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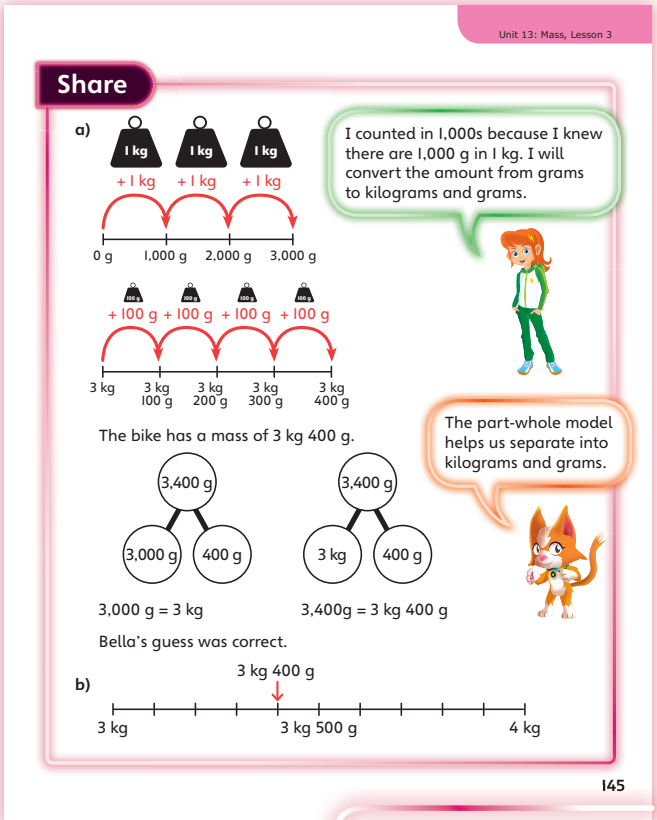
# Share

**WAYS OF WORKING** Whole class teacher led

**ASK**

- Question 1 a): *What amount would need to be added to the balance to make Richard's guess correct?*
- Question 1 b): *Can you point to Richard's amount on your scale?*

**IN FOCUS** Question 1 b) allows children to think about the relationship between grams and kilograms on a scale, giving them a context to work out the value of each interval and how many grams are found in 1 kg.

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# Think together

**WAYS OF WORKING** Whole class teacher led (I do, We do, You do)

**ASK**

- Question 1: *How can you convert 4 kg 1 g into grams only?*
- Question 2: *How many ways can you find which include one or more kilogram weights?*

**IN FOCUS** Question 1 requires children to convert 943 g into kilograms and grams. Listen closely to children's reasoning. Some may suggest that there are no kilograms, so the answer does not change; this shows confidence and a firm understanding of place value in the context of mass. Others may suggest that there are 9 kg and 430 g: these children will probably need some support.

Question 2 requires children to represent amounts with different weights. Encourage children to find more than one answer.

**STRENGTHEN** Revise knowledge of place value before asking children to do conversions in Question 1. Remind children of using 0 as a place holder. Use place value grids to support less confident children.

**DEEPEN** In question 3, ask children which values they found challenging. Children may identify 1 kg 3 g and 1 kg 30 g as being tricky because they look similar; they should realise that they need to understand place value in order to recognise the difference between these values. Develop children's understanding further by asking them to make their own matching game involving similar amounts.

**ASSESSMENT CHECKPOINT** Question 1 will allow you to assess whether children can convert between kilograms and grams. They will need to call upon their knowledge of place value in some of the questions. Look carefully at how children convert 4 kg 1 g.

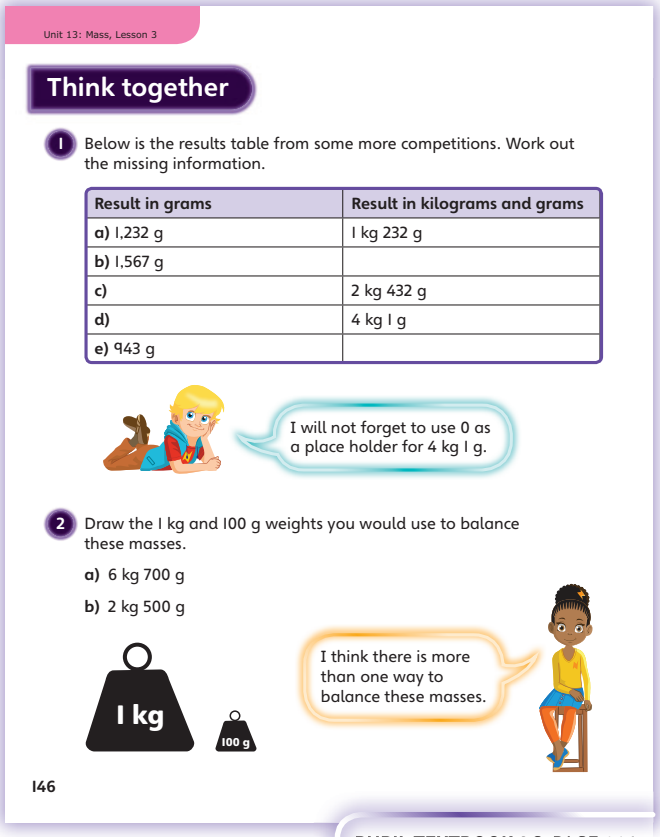
**ANSWERS**

Question 1:

| Result in grams | Result in kilograms and grams |
|---|---|
| **a)** 1,232 g | 1 kg 232 g |
| **b)** 1,567 g | 1 kg 567 g |
| **c)** 2,432 g | 2 kg 432 g |
| **d)** 4,001 g | 4 kg 1 g |
| **e)** 943 g | (0 kg) 943 g |

Question 2: There are a range of answers for this question. For example, 6 kg 700 g can be made using six 1 kg weights and seven 100 g weights, or five 1 kg weights and seventeen 100 g weights.

Question 3: 5 kg 643 g – 5,643 g; 1 kg 3 g – 1,003 g; 1 kg 30 g – 1,030 g; 1 kg 100 g – 1,100 g

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## Practice

**WAYS OF WORKING** Independent thinking

**IN FOCUS** Question 1 is an effective way to represent converting between kilograms and grams. The weights shown next to the part-whole models should help to scaffold learning.

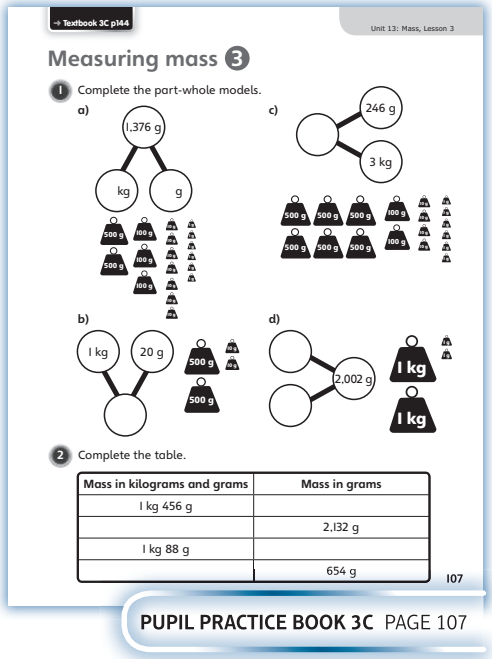
**STRENGTHEN** Children should practise converting amounts such as: 1 kg 200 g, 1 kg 20 g and 1 kg and 2 g. Use part-whole models to enable children to gain confidence with this way of modelling mass values. Ask children to tell you what the difference is between these amounts. This activity will greatly improve children's understanding of place value.

**DEEPEN** Question 5 will deepen learning by making children think about converting kilograms into grams and vice versa. Children will show mastery of the lesson if they can represent amounts in different ways. Repeat the activity for other amounts such as 5,640 g.

**THINK DIFFERENTLY** Question 4 is all about place value. Children will have to use their knowledge from the previous two lessons to work out the missing intervals and then reason why Lee is incorrect.

**ASSESSMENT CHECKPOINT** Question 3 can be used to assess children's understanding. Children will have to draw on their knowledge of reading scales and apply it to the learning in this lesson.

**ANSWERS** Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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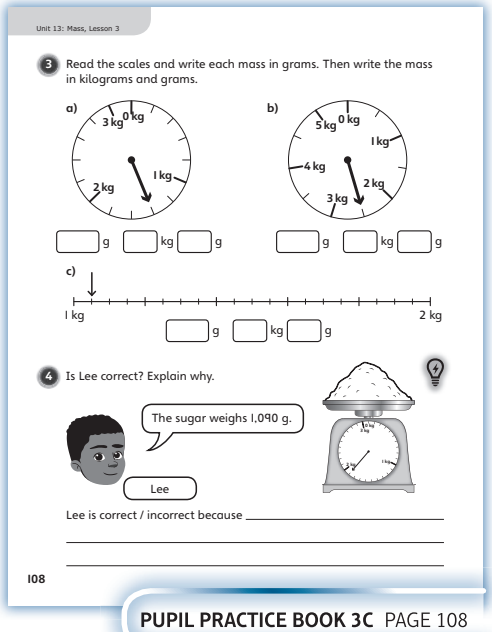


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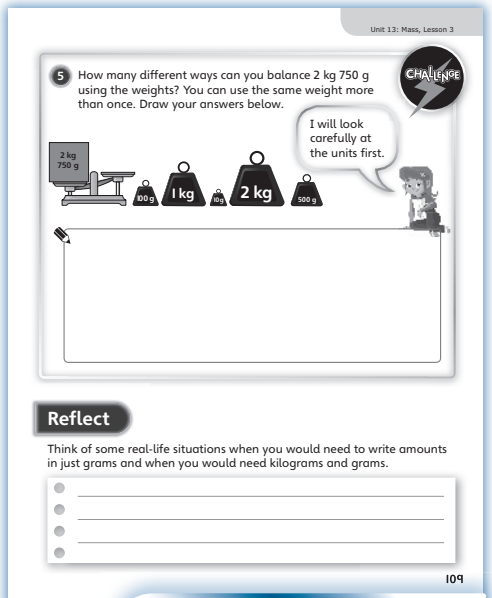
## Reflect

**WAYS OF WORKING** Independent thinking

**IN FOCUS** This activity will get children thinking about maths in real-life situations. Prompt children to look at the mass values of products the next time they go to the supermarket (this is a good home-learning activity).

**ASSESSMENT CHECKPOINT** Reflecting on real-life contexts will allow you to assess whether children can think about the importance of mass value in everyday situations. Children may think that only kilograms are used when we are estimating, or that they do not need to be overly accurate.

**ANSWERS** Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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## After the lesson

- Are all children secure at converting kilograms into grams and vice versa?
- Can children represent amounts in different ways?
- How will you link this lesson to the following one (comparing masses) as well as across the curriculum?

# Comparing masses

## Learning focus

In this lesson, children will compare masses by ordering them on a number line and by using <, > and =.

## Small steps

- Previous step: Measuring mass (3)
- **This step: Comparing masses**
- Next step: Adding and subtracting masses

## NATIONAL CURRICULUM LINKS

**Year 3 Measurement**

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

## ASSESSING MASTERY

Children can quickly order amounts and the use the correct language, such as: greater, more than, less than. Children can solve some problems involving ordering amounts.

## COMMON MISCONCEPTIONS

Children may assume an amount in grams is larger than kilograms; for example: 1,245 g > 2 kg 100 g. Ask:

- *Can you convert the grams to kilograms to help you decide?*

Children might confuse the signs < and >. Ask:

- *What is wrong with this sentence: 1 kg < 100 g?*

## STRENGTHENING UNDERSTANDING

Recap on the content and skills of converting amounts practised in the previous lesson.

## GOING DEEPER

Deepen learning by asking children to order the mass of real-life objects. It is important that children can feel heavier and lighter objects: ask them to hold different objects and arrange themselves in a line of ascending order of mass. This will deepen learning by allowing children to discuss their object's value with others and will encourage peer correction if they fail to order correctly.

## KEY LANGUAGE

**In lesson:** mass, scale, grams (g), kilograms (kg), weigh

**Other language to be used by the teacher:** measure, interval, difference, greater than (>), less than (<), equal to (=), compare, divide, dial, more than, order

## STRUCTURES AND REPRESENTATIONS

number line, place value counters

## RESOURCES

**Mandatory:** weighing scales, weights

**Optional:** modelling clay, number lines

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

## Before you teach

- Do all children have a sound knowledge of converting grams and kilograms?
- Is the key vocabulary on display in your classroom?
- Do children know what the signs <, >, and = mean?

# Discover

**WAYS OF WORKING** Pair work

**ASK**

- Question 1 a): *Would it help to convert grams to grams and kilograms for the pineapple?*
- Question 1 a): *Is the item with the largest mass also the biggest item?*
- Question 1 b): *Did you give your answer in both grams and kilograms? Why?*

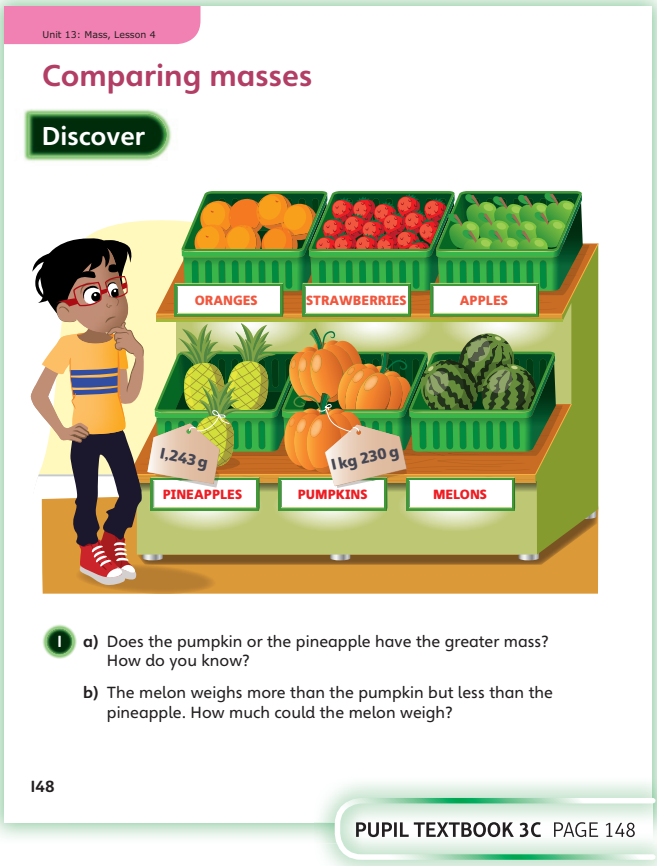
**IN FOCUS** Question 1 a) shows mass in grams and also kilograms and grams, which children will have seen before. In this question, children need to compare these masses in both grams and kilograms and grams, in a real-life context.

**PRACTICAL TIPS** Bring in a pineapple and a pumpkin so children can physically compare them. Discuss why we need scales to measure two objects which are close in weight value.

**ANSWERS**

Question 1 a): The pineapple has the greater mass (1 kg 243 g > 1 kg 230 g).

Question 1 b): The melon could weigh 1 kg 231 g, 1 kg 232 g, 1 kg 233g, 1 kg 234 g, 1 kg 235g, 1 kg 236 g, 1 kg 237 g, 1 kg 238 g, 1 kg 239 g, 1 kg 240 g, 1 kg 241 g or 1 kg 242 g.

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# Share

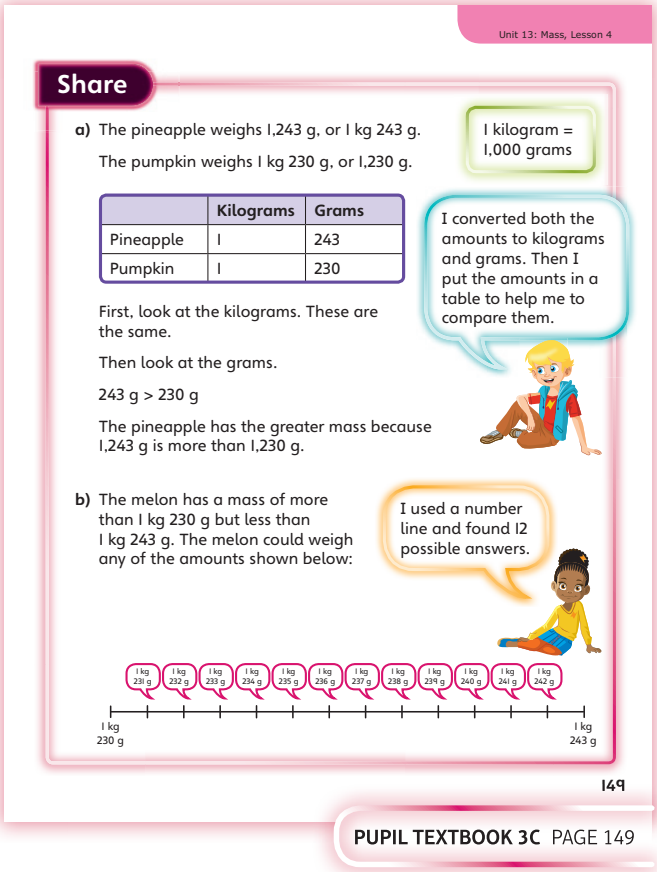
**WAYS OF WORKING** Whole class teacher led

**ASK**

- Question 1 a): *When comparing the amounts, did you look at the kilograms or grams first?*
- Question 1 b): *Why do you think there is more than one answer?*

**IN FOCUS** In question 1 a), children may convert the mass of the pumpkin into grams. Explain that this is correct but is a less efficient method of working.

In question 1 b), children are presented with a number line. Explain that number lines can be useful when asked to find the possible numbers between two numbers.

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# Think together

**WAYS OF WORKING** Whole class teacher led (I do, We do, You do)

**ASK**

- Question 1 : *What do the signs < and > mean?*
- Question 2 : *Why are the scales incorrect?*

**IN FOCUS** Question 2 allows children to convert the amounts and then work out which scales are incorrect. There are some amounts that will require a good knowledge of place value: for example, in question 2 c), 1 kg 3 g is very similar to 1,001 g.

**STRENGTHEN** Children may find it helpful to use a table to convert, compare and order masses, as shown below:

| Kilograms | Grams |
|---|---|
| | |

**DEEPEN** In question 2 , ask children to explain why the scales are incorrect. Can they suggest an amount which would make each scale correct? Some children may point out that although 2 d) is correct, in reality they would almost be balanced because the difference between each side is only 2 g; this shows a good understanding of place value in the context of mass.

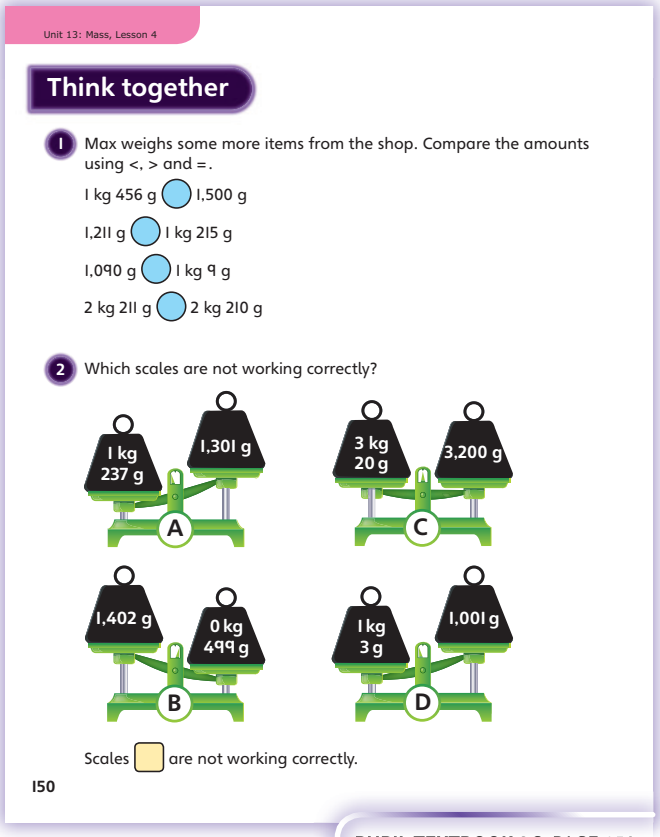
**ASSESSMENT CHECKPOINT** Question 3 can be used to assess whether children can compare more than two amounts. Assess children's ability to find ways to compare the amounts and to explain their answers clearly and concisely.

**ANSWERS**

Question 1 : 1 kg 456 g < 1,500 g
1211 g < 1 kg 215 g
1090g > 1 kg 9 g
2 kg 211 g > 2 kg 210 g

Question 2 : Scales A, B and C are not working correctly.

Question 3 : 754 g, 1 kg 9 g, 1,090 g, 1 kg 91 g, 1,098 g, 1,432 g, 1 kg 900 g

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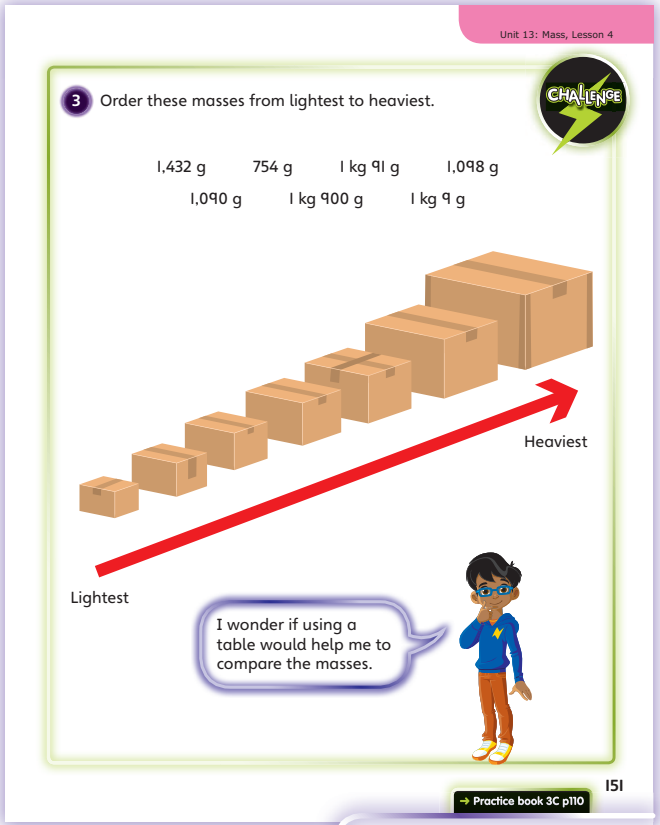


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## Practice

**WAYS OF WORKING** Independent thinking

**IN FOCUS** Question 5 requires children to have a good understanding of place value. Ask children to convert the amounts and then find the lowest value. After this, they should be able to complete the question.

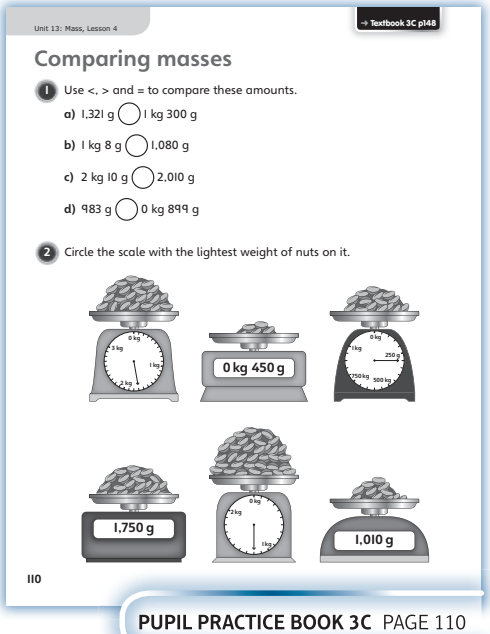
**STRENGTHEN** Ask children to practise ordering everyday objects from home and in the classroom, such as bags of flour, tins of soup, pegs, pencils and so on.

**DEEPEN** An important learning point in this lesson is that just because an object is bigger, it is not necessarily heavier. Children need to understand this in order to answer question 1. Demonstrate this with a small metal weight and a large cushion. You could also ask children to say which is heavier: 100 feathers or 100 bricks.

**THINK DIFFERENTLY** Question 4 provides an opportunity for reasoning and problem solving. Ask children to explain their answers; they should be able to give a range of values for B, C and D.

**ASSESSMENT CHECKPOINT** Question 1 will allow you to assess whether children can compare amounts using the <, > and = signs.

**ANSWERS** Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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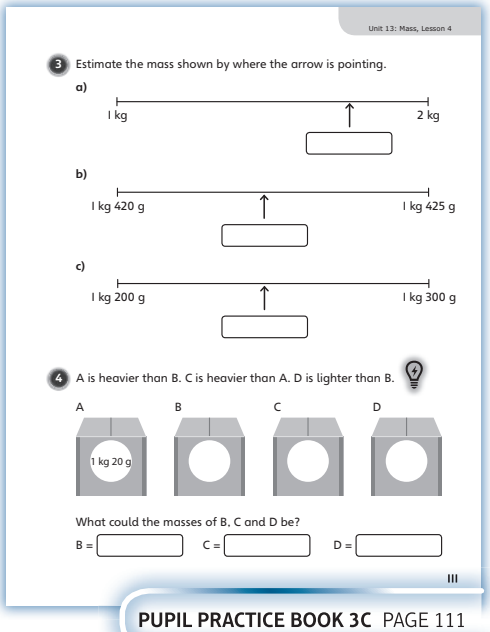


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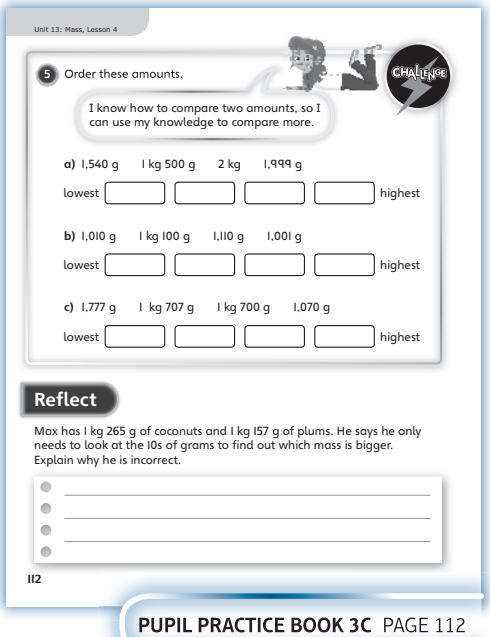
## Reflect

**WAYS OF WORKING** Pair work

**IN FOCUS** This activity will get children thinking about efficient methods of ordering. Children should realise that they always need to look at the kilograms, then the 100s of grams, then the 10s of grams and then the 1s.

**ASSESSMENT CHECKPOINT** Listen carefully to children's reasoning: they should be explaining that once Max has checked the kilograms and realised they are equal, he only needs to look at the hundreds of grams to see which mass is bigger.

**ANSWERS** Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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## After the lesson

- Are all children secure in their knowledge of comparing and converting mass values?
- How can you provide further opportunities across the curriculum for comparing a range of objects?

# Adding and subtracting masses

## Learning focus

In this lesson, children will add and subtract masses, which include mixed units, using a range of strategies. They will continue to convert mass values between grams and kilograms.

## Small steps

- Previous step: Comparing masses
- **This step: Adding and subtracting masses**
- Next step: Problem solving – mass

## NATIONAL CURRICULUM LINKS

**Year 3 Measurement**

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

## ASSESSING MASTERY

Children can use efficient strategies to add and subtract mixed-value masses. They should be able to explain their methods and give reasons for why they have used a particular method.

## COMMON MISCONCEPTIONS

Children may not add the kilograms and grams separately. Ask:

- *Can you add kilograms if they cross the 1,000 barrier?*

Children may not convert the grams to kilograms. For example, they may write 1,200 g. Ask:

- *Do you need to convert grams? Why not?*

## STRENGTHENING UNDERSTANDING

To highlight the importance of conversion before carrying out an operation, ask children if they can add 1 kg 100 g to 1,500 g without converting. Then remind children how to convert grams to kilograms if needed.

Use representations such as the number line to support understanding of addition and subtraction.

## GOING DEEPER

Deepen learning by challenging children to solve missing number problems. Ask questions such as:

- *On a balancing scale, if a vase weighs 1 kg 500 g on the heavier side and there are 3 toy cars weighing 375 g on the lighter side, how many more cars do you need to make the scales balance?*

## KEY LANGUAGE

**In lesson:** mass, weigh, scale, grams (g), kilograms (kg)

**Other language to be used by the teacher:** measure, scale, interval, difference, divide, dial, add, subtract, more than, difference, take away, plus, minus, sum, total, inverse

## STRUCTURES AND REPRESENTATIONS

number line, bar model, column addition

## RESOURCES

**Mandatory:** weighing scales

**Optional:** modelling clay, number lines

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

## Before you teach

- Are all children secure in addition and subtraction operations?
- How will you support children who find counting on a number line difficult?

# Discover

**WAYS OF WORKING** Pair work

**ASK**

- Question 1 a): *What are the key words that help you identify which operation to use?*
- Question 1 b): *What strategies could you use to work this out?*

**IN FOCUS** Question 1 a) requires children to focus their attention on the language of the question and correctly identify the words that indicate which operation they should use to work out the answer.

In question 1 b), some children may think 'more … than' means they should add. Explain this question in the context of more than as finding a difference between two values.

**PRACTICAL TIPS** Addition and subtraction in a real-life context is important for learning. Do some practical measuring of mass in the classroom and then ask children to add more mass, or take some away. This could be done in a cooking and nutrition lesson.

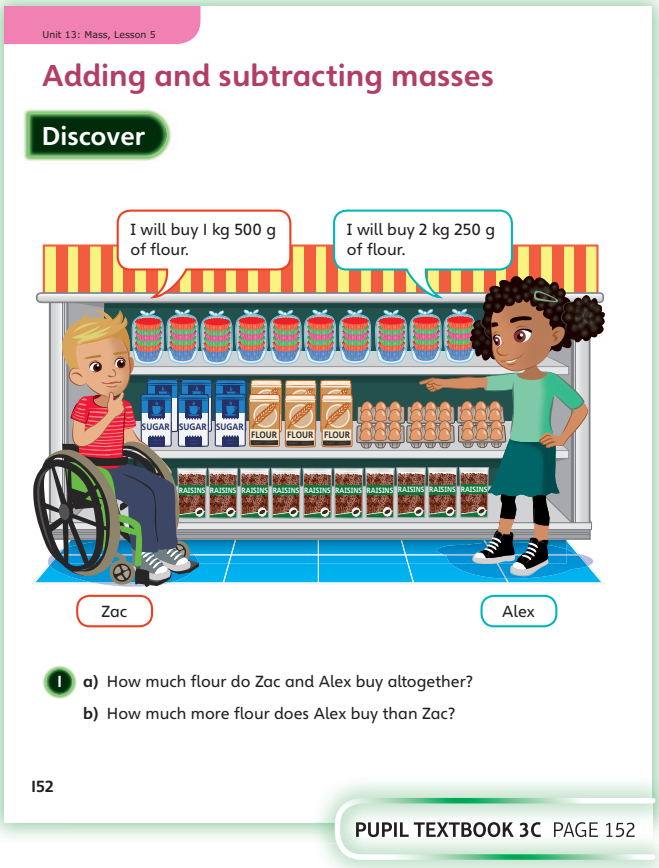
**ANSWERS**

Question 1 a): 1 kg 500 g + 2 kg 250 g = 3 kg 750 g

Alex and Zac buy 3 kg 750 g of flour altogether.

Question 1 b): 2 kg 250 g – 1 kg 500 g = 750g

Alex buys 3 kg 750 g more flour than Zac.

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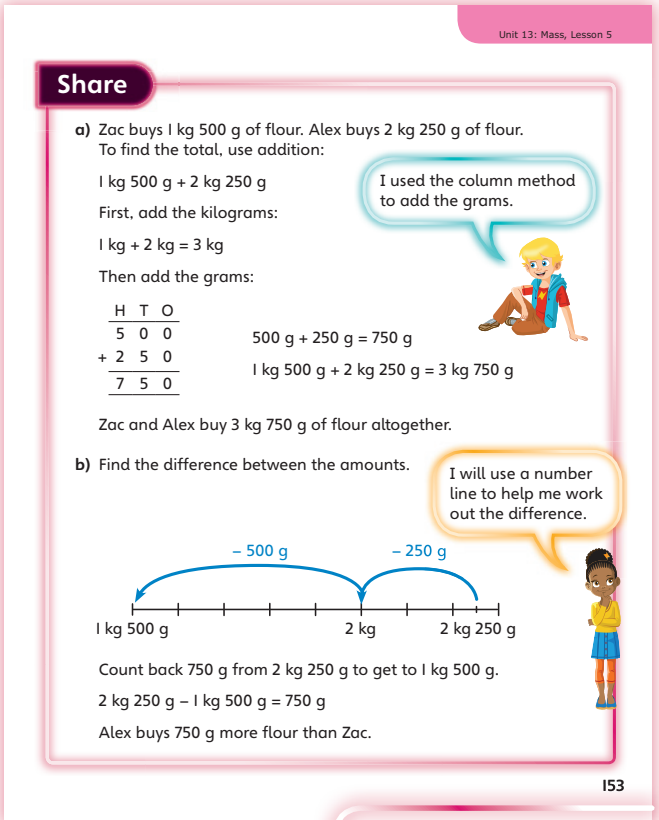
# Share

**WAYS OF WORKING** Whole class teacher led

**ASK**

- Question 1 a): *Did you remember to add the grams and kilograms separately?*
- Question 1 b): *Which strategy did you find the most efficient: using a number line or using the column method?*

**IN FOCUS** Question 1 encourages children to use different strategies, in particular the column method and using a number line to add and subtract. Discuss how Flo has used the number line to find the difference between both numbers and the nearest kilogram as an efficient method to find the total difference. Ask children which strategy they find more efficient (this is a great whole class talking point).

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# Think together

**WAYS OF WORKING** Whole class teacher led (I do, We do, You do)

**ASK**

- Question 1: *Can you explain your chosen method?*
- Question 3: *How is the column method useful for solving these problems?*
- Question 3: *How can you use the inverse operation to check your answers?*

**IN FOCUS** In question 1, point out that the answers could be written in grams or kilograms (depending on which way children convert). Encourage children to convert to kilograms: it makes the amounts more manageable (also children are not expected to add 4-digit numbers in Year 3).

**STRENGTHEN** Provide children with more activities similar to question 2. Practising with the number line is an important skill for children; at first, they may need to make multiple jumps.

**DEEPEN** In question 2, ask children to explain what operation is needed for each number line. They will have to think carefully about the missing number problems. Children should realise that, on the first two number lines, they must add the two amounts, however, on the third number line, they must do a subtraction. This is a good discussion point, and children will demonstrate a deeper understanding if they can explain this.

**ASSESSMENT CHECKPOINT** Question 1 can be used to assess whether children can add and subtract amounts which require a conversion first.

**ANSWERS**

Question 1 a): 2,423 g + 1 kg 221 g = 3 kg 644 g

Question 1 b): 2 kg 800 g + 200 g = 3 kg

Question 1 c): 1,950 g + 5 kg 100 g = 7 kg 50 g

Question 2 a): The difference is 750 g

Question 2 b): The difference is 1 kg 300 g

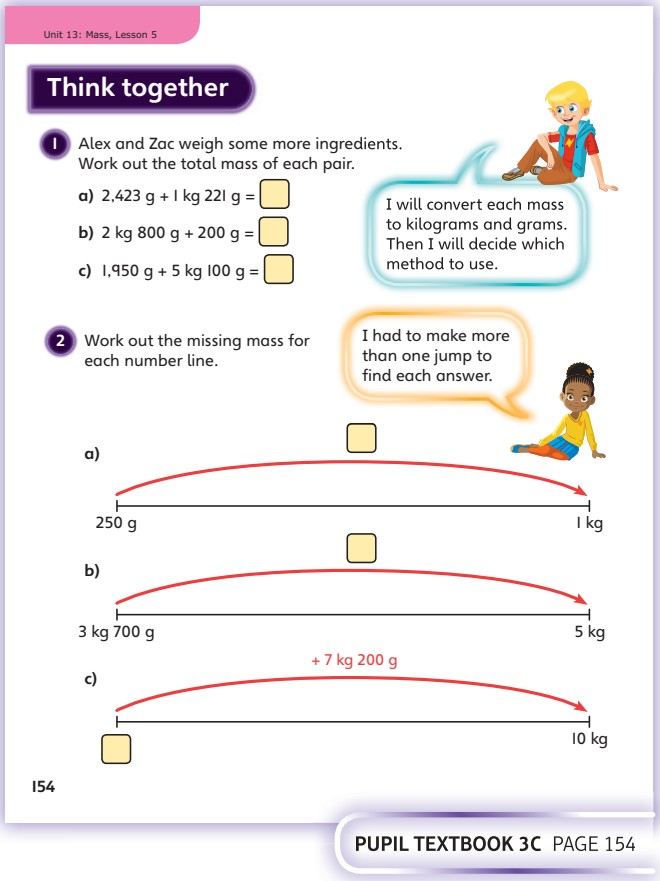
Question 2 c): The starting mass is 2 kg 800 g

Question 3 a): 1 kg 500 g + **750 g** = 2,250 g

Question 3 b): **1 kg 150 g** + 2 kg 100 g = 3 kg 250 g

Question 3 c): **3 kg 800 g** – 1,900 g = 1 kg 900 g

Question 3 d): 3 kg 500 g – **900 g** = 2 kg 600 g

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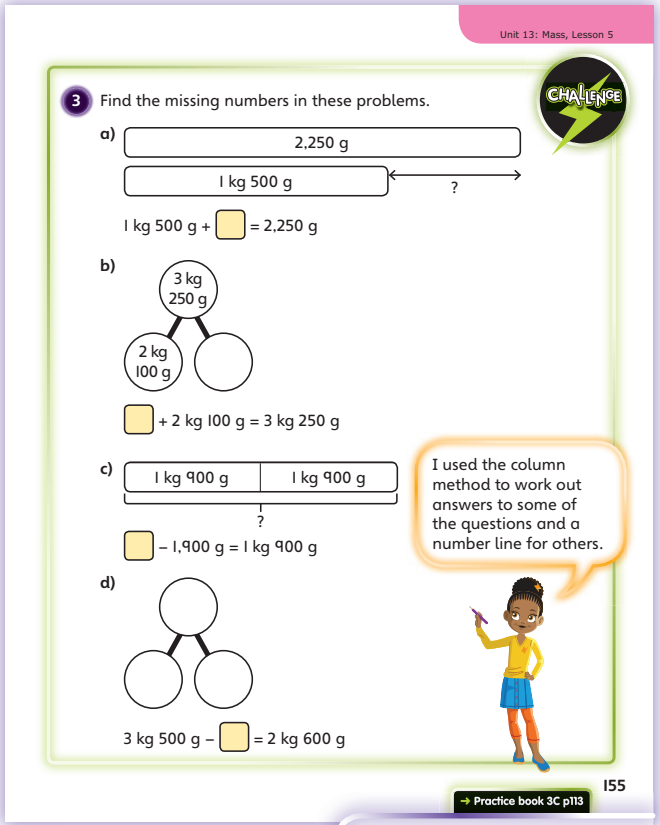


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## Practice

**WAYS OF WORKING** Independent thinking

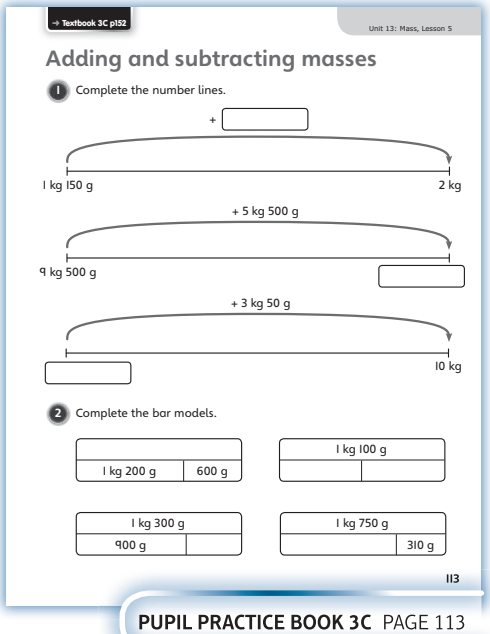
**IN FOCUS** Questions 1 and 5 help encourage children to use a range of strategies when adding and subtracting in the context of mass. The column method is a good strategy, but make sure children realise that it is not always the most efficient: they may find the bar method or using a number line is quicker. Questions 1 and 2 explore number lines and bar models to provide practice in the use of these strategies.

**STRENGTHEN** Allow children to practise addition and subtraction strategies, such as using number lines for questions similar to those calculations in question 3. Ask children to come up with their own problems for the class to solve together.

**DEEPEN** In question 3, challenge children to add or subtract more than two amounts. This will deepen children's learning as they work with what they have learnt and apply it when solving a multi-step number sentence.

**ASSESSMENT CHECKPOINT** Question 2 will give you an insight into which children understand how addition and subtractions can be visually represented using bar models.

**ANSWERS** Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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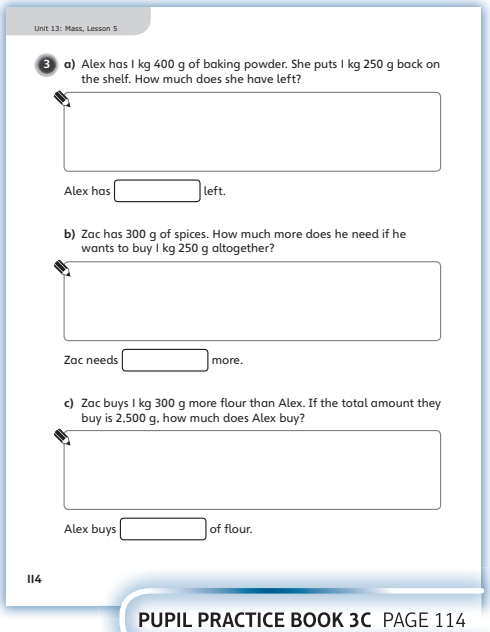


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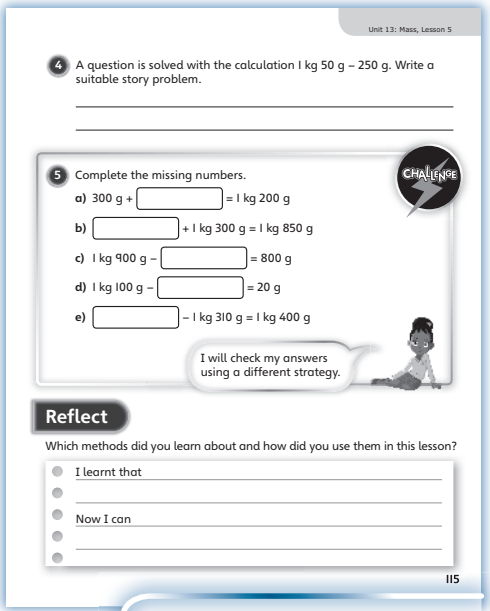
## Reflect

**WAYS OF WORKING** Pair work

**IN FOCUS** This activity allows the sharing of ideas and methods. Children will have to explain their methods: a great learning point in itself.

**ASSESSMENT CHECKPOINT** Look carefully at children's explanations of methods. Do they understand why some methods are more efficient than others?

**ANSWERS** Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.

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## After the lesson

- How will you build on this lesson with practical activities across the curriculum which involve the addition and subtraction of masses?
- Are all children secure in solving missing number problems? Do some need further support?
- Do children know how to add, and find the difference between, two masses given as a combination of grams, and kilograms and grams?

# Problem solving – mass

## Learning focus

In this lesson, children will use all of the knowledge and strategies they have learnt in this unit to solve problems involving mass.

## Small steps

- Previous step: Adding and subtracting masses
- **This step: Problem solving – mass**
- Next step: Measuring capacity (1)

## NATIONAL CURRICULUM LINKS

**Year 3 Measurement**

Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

## ASSESSING MASTERY

Children can solve problems effectively, using suitable strategies such as choosing the correct method of addition or subtraction. Children can explain how they solved the problem clearly and using the correct vocabulary.

## COMMON MISCONCEPTIONS

Children may misinterpret the question and carry out an incorrect calculation. Ask:

- *How can you check your answer?*

Children may not be able to show the question using a visual representation. Ask:

- *Can you draw a bar model to help you solve the problem?*

## STRENGTHENING UNDERSTANDING

Ask children to construct bar models to represent the problems. This should help them understand what is required to find a solution.

## GOING DEEPER

To deepen learning, give children some answers (for example, 4 kg 20 g) and ask them to create multi-step problems to match them; asking children to explain their method for constructing and solving their problems will help to consolidate their understanding of the different ways to solve problems.

## KEY LANGUAGE

**In lesson:** mass, scale, interval, grams (g), kilograms (kg)

**Other language to be used by the teacher:** measure, difference, divide, dial, problem

## STRUCTURES AND REPRESENTATIONS

number line, place value counters, bar model, part-whole model, column addition

## RESOURCES

**Optional:** weighing scales, modelling clay, number lines

In the eTextbook of this lesson, you will find interactive links to a selection of teaching tools.

## Before you teach

- Can a classroom display support problem solving with mass values?
- Are all children secure in operations such as multiplication and division?

# Discover

**WAYS OF WORKING** Pair work

**ASK**

- Question 1 a): *Which method could you use?*
- Questions 1 a) and b): *How many steps are in this problem?*

**IN FOCUS** Question 1 b) focuses on subtraction. Children may have used the column method to find the solution to question 1 a); you may want to model finding the difference on a number line as a more efficient mental strategy.

**PRACTICAL TIPS** For this activity, encourage children to use a range of strategies to work out the answers, and use bar models to highlight how you can find the difference between two values. Afterwards, share the different methods.

**ANSWERS**

Question 1 a): 3 × 500 g = 1,500 g

1,500 g – 1,300 g = 200 g

Zac has 200 g of flour left.

Question 1 b): 200 g – 125 g = 75 g

Zac has 75 g of flour left now.


Unit 13: Mass, Lesson 6

Problem solving – mass

Discover

I bought three 500 g bags of flour, but I only used 1,300 g.

Alex

Zac

FLOUR

1 a) How much flour does Zac have left?

b) Zac spills 125 g. How much flour does Zac have left now?

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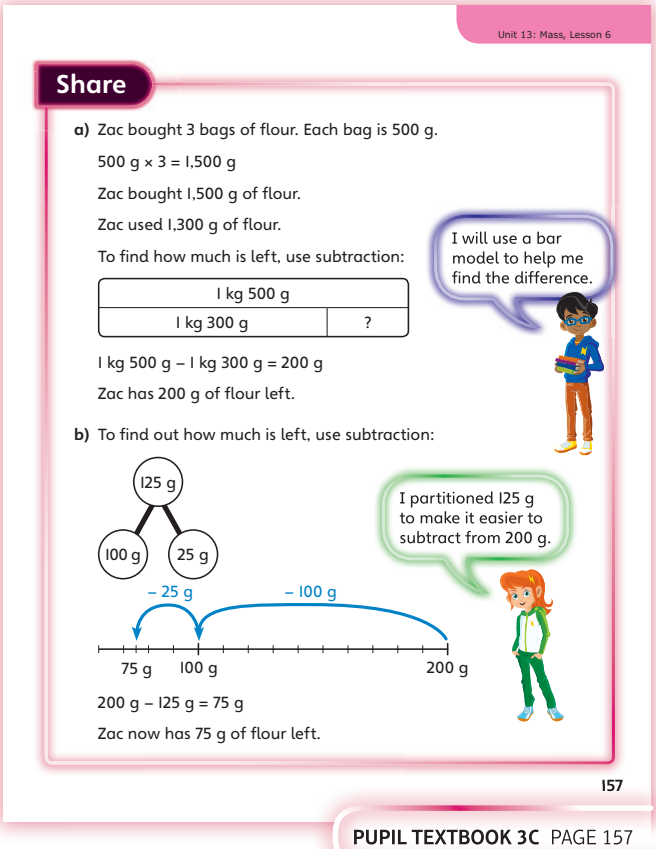
# Share

**WAYS OF WORKING** Whole class teacher led

**ASK**

- Question 1 a): *How does the bar model help?*
- Question 1 b): *How does the number line help?*
- Questions 1 a) and b): *Are there any other methods you could use?*

**IN FOCUS** For both parts of the question, encourage children to work methodically and in clear steps. Children should record their workings in a series of number sentences. Some children may need the bar model and number line to be explained to them, to help them understand the problems.


Unit 13: Mass, Lesson 6

Share

a) Zac bought 3 bags of flour. Each bag is 500 g.

500 g × 3 = 1,500 g

Zac bought 1,500 g of flour.

Zac used 1,300 g of flour.

To find how much is left, use subtraction:

| 1 kg 500 g | |
|---|---|
| 1 kg 300 g | ? |

1 kg 500 g – 1 kg 300 g = 200 g

Zac has 200 g of flour left.

I will use a bar model to help me find the difference.

b) To find out how much is left, use subtraction:

125 g

100 g 25 g

– 25 g – 100 g

75 g 100 g 200 g

I partitioned 125 g to make it easier to subtract from 200 g.

200 g – 125 g = 75 g

Zac now has 75 g of flour left.

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# Think together

**WAYS OF WORKING** Whole class teacher led (I do, We do, You do)

**ASK**

- Question 1 : *How could the scale help you work out the problem?*
- Question 3 : *Which object do you think you should work out first? Why?*
- Question 3 : *How could you find out what one robot is worth?*

**IN FOCUS** In questions 1 and 2 , children may work out the intervals on the scale and then use it as a number line to help them work out the answer. This is a good strategy and should be encouraged.

**STRENGTHEN** Use question 3 to explore the various calculation steps with learners who need more support and scaffolding. Ask children what they should find out first. If they are unsure, you may want to point at the two robots on the second scale and ask how they could work out what one robot might be worth.

In question 2 , remind children that they can work out 40 × 3 by using place value knowledge (some may start with a written method).

**DEEPEN** Question 3 can be used to deepen learning because it allows children to break down a problem clearly. Ask children to create their own similar problem.

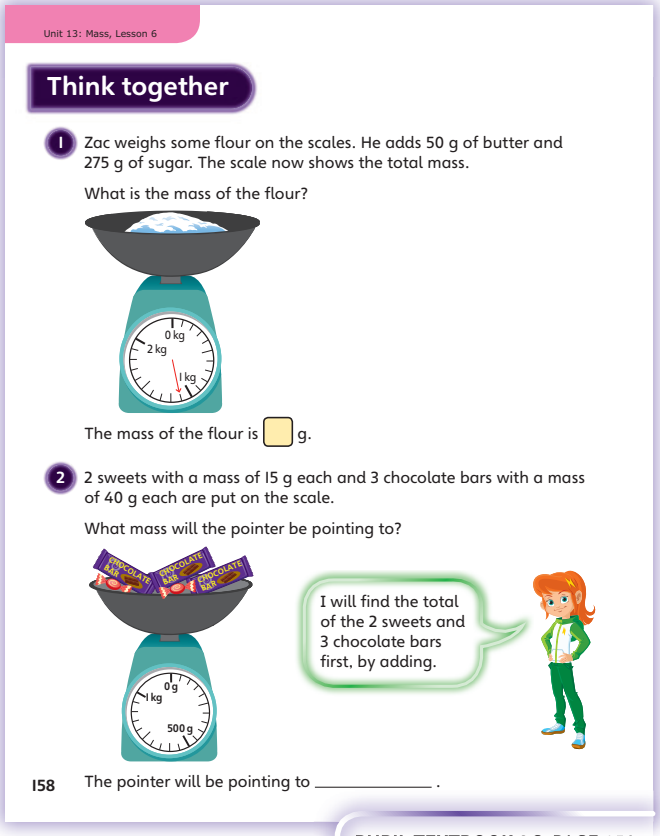
**ASSESSMENT CHECKPOINT** Question 3 is a good indication of which children have mastered the lesson. Those who have will demonstrate a clear understanding of the question and will be able to use appropriate strategies to work out the answers.

**ANSWERS**

Question 1 : 1 kg 100 g – 50 g = 1,050 g
1,050 g – 275 g = 775 g
The mass of the flour is 775 g.

Question 2 : 15 g × 2 = 30 g
40 g × 3 = 120 g
The total mass is 150 g.
The pointer will be pointing to 150 g.

Question 3 : A robot weighs 1,050 g (2,100 g ÷ 2 = 1,050 g)
3 robots weigh 3,150 g (1,050 g × 3 = 3,150 g)
2 wagons weigh 1,000 g (4,150 g – 3,150 g = 1,000 g)
The mass of 1 wagon is 500 g
(1,000 g ÷ 2 = 500 g).

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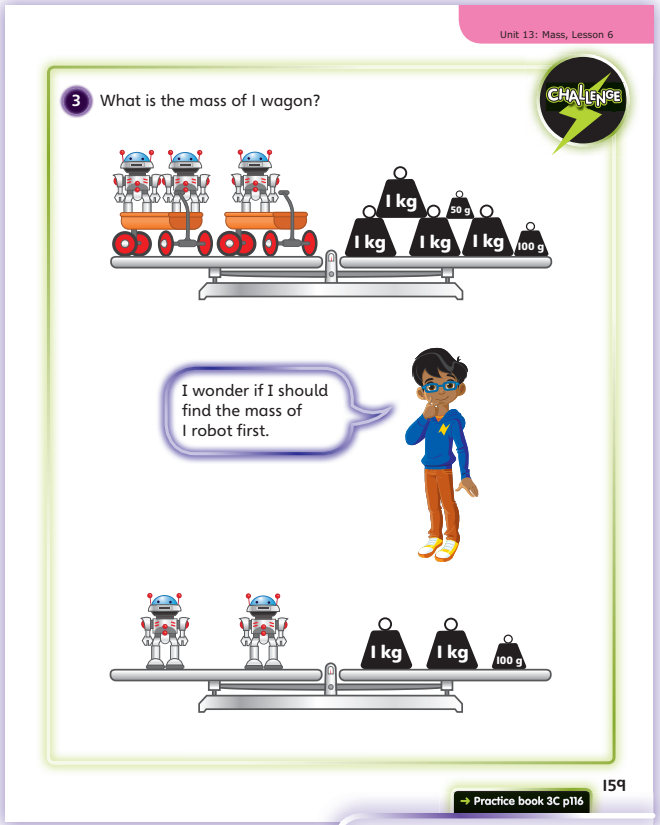


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## Practice

**WAYS OF WORKING** Independent thinking

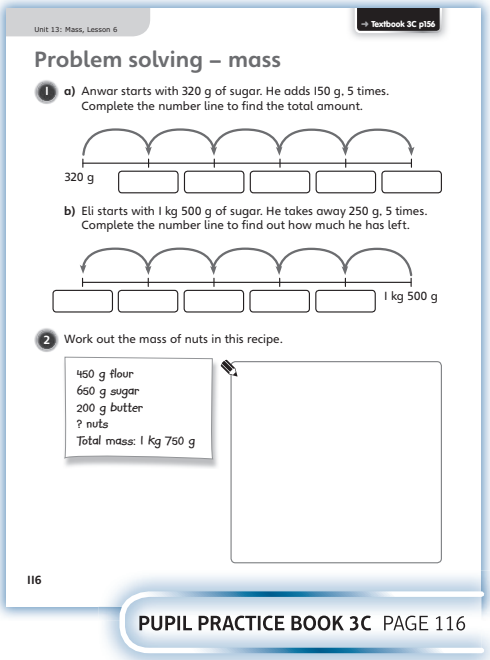
**IN FOCUS** Question 1 allows children to practise adding mass values using a number line. In question 2, encourage children to explore the problem using a representation such as the bar model. This is important as it gives children a visual understanding of the question.

**STRENGTHEN** Run intervention in which children practise calculation strategies. Apply these strategies to word problems and use the bar model to represent them.

**DEEPEN** After completing question 4, challenge children to create similar problems. This will deepen learning as children will need to think carefully about their own problems – this will involve both creativity and logic.

**ASSESSMENT CHECKPOINT** Question 3 can be used to see if children can extract the right information from the word problem in order to complete the bar model. This question will also test their understanding of mixed-value masses.

**ANSWERS** Answers for the **Practice** part of the lesson appear in the separate **Practice and Reflect answer guide**.


Unit 13: Mass, Lesson 6

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Problem solving – mass

1 a) Anwar starts with 320 g of sugar. He adds 150 g, 5 times. Complete the number line to find the total amount.

320 g

b) Eli starts with 1 kg 500 g of sugar. He takes away 250 g, 5 times. Complete the number line to find out how much he has left.

1 kg 500 g

2 Work out the mass of nuts in this recipe.

450 g flour
650 g sugar
200 g butter
? nuts
Total mass: 1 kg 750 g

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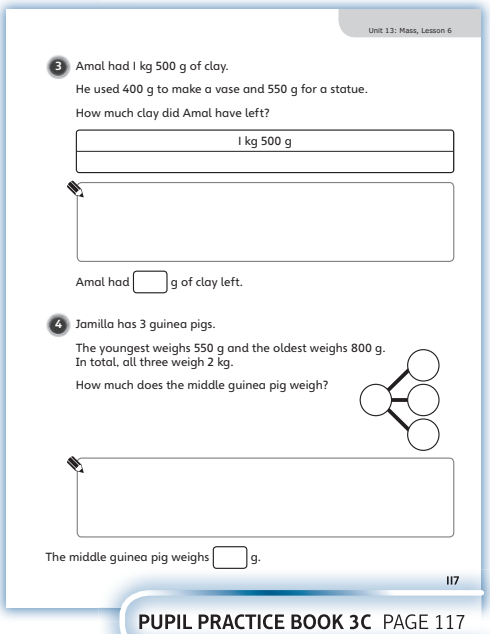
Unit 13: Mass, Lesson 6

3 Amal had 1 kg 500 g of clay.
He used 400 g to make a vase and 550 g for a statue.
How much clay did Amal have left?

1 kg 500 g

Amal had ☐ g of clay left.

4 Jamilla has 3 guinea pigs.
The youngest weighs 550 g and the oldest weighs 800 g.
In total, all three weigh 2 kg.
How much does the middle guinea pig weigh?

The middle guinea pig weighs ☐ g.

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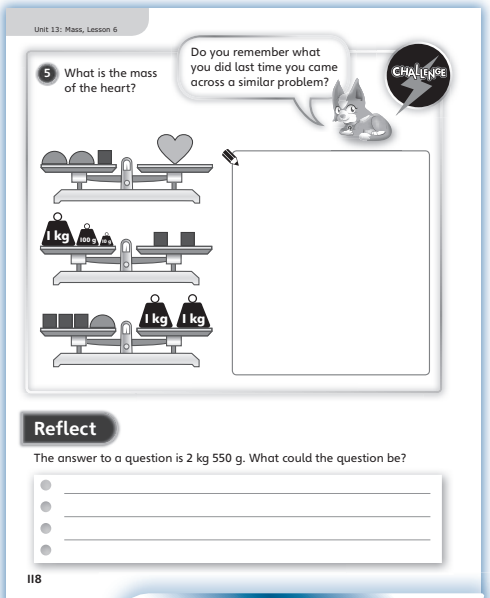
## Reflect

**WAYS OF WORKING** Pair work

**IN FOCUS** This activity consolidates learning in the lesson. Children will have to use their knowledge of problem solving in order to create a question to match a given answer. Encourage children to think of a multi-step question.

**ASSESSMENT CHECKPOINT** Ask children to swap their books with a partner and solve each other's questions. Look for multi-step questions which are correct.

**ANSWERS** Answers for the **Reflect** part of the lesson appear in the separate **Practice and Reflect answer guide**.


Unit 13: Mass, Lesson 6

5 What is the mass of the heart?

Do you remember what you did last time you came across a similar problem?

CHALLENGE

1 kg 500 g 1 kg 1 kg

Reflect

The answer to a question is 2 kg 550 g. What could the question be?

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## After the lesson

- Are all children secure in the aims for each lesson and ready for the **End of unit check**?
- Could children recognise and explain what approach they were taking to solve each problem?
- What were the main misconceptions children had during this lesson? How did you resolve them?

# End of unit check

**Don't forget the *Power Maths* unit assessment grid on p26.**

**WAYS OF WORKING** Group work adult led

**IN FOCUS**

This **End of unit check** will allow you to focus on children's understanding of measuring mass and whether they can apply their knowledge in order to solve problems.

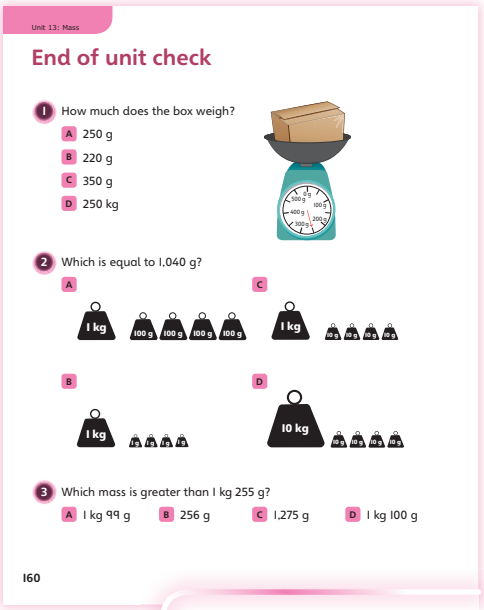
Look carefully at the answer that is given for question **5** : it will tell you if children can read two scales and then find the sum of the amounts.

The final question here is a SATs-style question. Talk through the question and, after children have answered it, explore answers.

Encourage children to think through or discuss this section before writing their answer in **My journal**.

**ANSWERS AND COMMENTARY**

Children should be secure with reading a range of scales and finding missing intervals. They should also be able to convert between grams and kilograms. Children should be confident when calculating answers to addition and subtraction questions involving mass, and should be able to check their strategies. Finally, they should apply their learning when solving problems.


Unit 13: Mass

End of unit check

1 How much does the box weigh?

A 250 g
B 220 g
C 350 g
D 250 kg

2 Which is equal to 1,040 g?

A 1 kg, 100 g, 100 g, 100 g, 100 g
C 1 kg, 40 g
B 1 kg, 40 g
D 10 kg, 40 g

3 Which mass is greater than 1 kg 255 g?

A 1 kg 99 g B 256 g C 1,275 g D 1 kg 100 g

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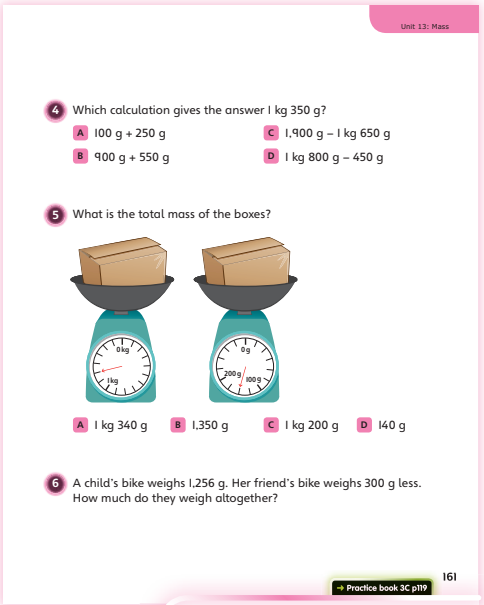
Unit 13: Mass

4 Which calculation gives the answer 1 kg 350 g?

A 100 g + 250 g
C 1,900 g – 1 kg 650 g
B 900 g + 550 g
D 1 kg 800 g – 450 g

5 What is the total mass of the boxes?

A 1 kg 340 g B 1,350 g C 1 kg 200 g D 140 g

6 A child's bike weighs 1,256 g. Her friend's bike weighs 300 g less. How much do they weigh altogether?

→ Practice book 3C p119

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| Q | A | WRONG ANSWERS AND MISCONCEPTIONS | STRENGTHENING UNDERSTANDING |
|---|---|---|---|
| 1 | A | D suggests that the child has not read the units at the top of the scale. | Give children support with real-life contexts for measuring mass:<br>• Ask children to convert measurements from grams to kilograms and vice versa.<br>• Display the key vocabulary of the unit in your classroom.<br>• Ask children to match word problems with representations such as bar models and number lines. |
| 2 | C | Any other answer suggests that children are not secure with the fact that 1 kg = 1,000 g or that they do not fully understand place value. | |
| 3 | C | B may suggest that children are struggling to convert and then compare amounts. | |
| 4 | D | B suggests that children have some difficulty crossing the kilogram barrier. | |
| 5 | A | D may suggest that children have only looked at the second scale and hasn't interpreted the question fully. | |
| 6 | 2,212 g | Have children followed both steps of the problem? | |

## My journal

**WAYS OF WORKING** Independent thinking

**ANSWERS AND COMMENTARY**

Question 1 : Children should realise that they have to look at the balance first to work out the mass of the pineapple. They can then take this away from the value on the first scale, to leave the mass of the pear.

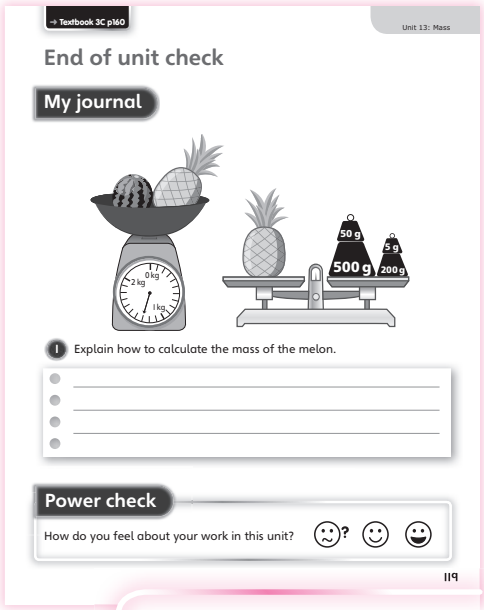
The calculations are as follows:

500 g + 200 g + 50 g + 5 g = 755 g

1 kg 300 g – 755 g = 545 g

Children are likely to use the column method for the addition and the number line for the subtraction.

If children are finding it difficult to write an explanation, ask: *Should you find the total amounts of each side of the scale first?*

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## Power check

**WAYS OF WORKING** Independent thinking

**ASK**

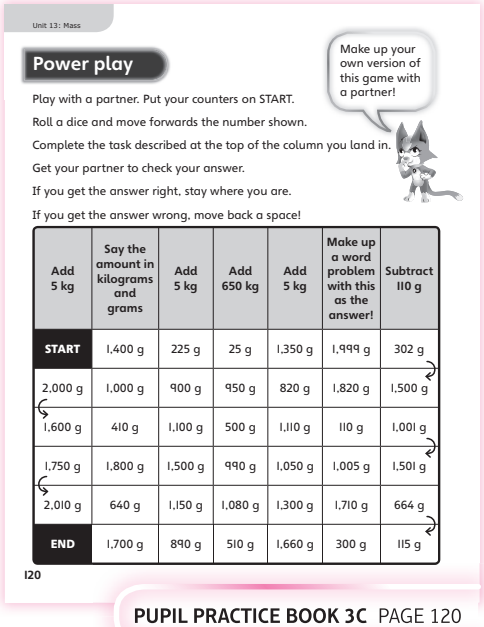
- *What visual representation helped you in this unit?*
- *What do you know now that you did not at the start of the unit?*
- *Can you write down what new words you have learnt and what they mean?*

## Power play

**WAYS OF WORKING** Pair work

**IN FOCUS** Use this **Power play** to assess children's addition, subtraction and problem-solving skills (involving masses). Can children explain their methods or any strategies they used?

**ANSWERS AND COMMENTARY** If children can do the **Power Play**, it means they can use learnt strategies to find solutions. Listen to the explanations of their strategies and note down any children who may need further support. Children should be encouraged to go deeper with this **Power play** by creating their own similar game.




| Add 5 kg | Say the amount in kilograms and grams | Add 5 kg | Add 650 kg | Add 5 kg | Make up a word problem with this as the answer! | Subtract 110 g |
|---|---|---|---|---|---|---|
| START | 1,400 g | 225 g | 25 g | 1,350 g | 1,999 g | 302 g |
| 2,000 g | 1,000 g | 900 g | 950 g | 820 g | 1,820 g | 1,500 g |
| 1,600 g | 410 g | 1,100 g | 500 g | 1,110 g | 110 g | 1,001 g |
| 1,750 g | 1,800 g | 1,500 g | 990 g | 1,050 g | 1,005 g | 1,501 g |
| 2,010 g | 640 g | 1,150 g | 1,080 g | 1,300 g | 1,710 g | 664 g |
| END | 1,700 g | 890 g | 510 g | 1,660 g | 300 g | 115 g |

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## After the unit

- Are all children secure in converting mass units, finding an interval value and applying the correct method when working out multi-step problems?
- How will you link this unit to other areas of the curriculum, for example weighing materials in art and design?

**Strengthen** and **Deepen** activities for this unit can be found in the *Power Maths* online subscription.