Reasoning and Problem Solving
Step 4: Add and Subtract Mass

National Curriculum Objectives:

Mathematics Year 3: (3M1b) Compare mass (kg/g)
Mathematics Year 3: (3M2b) Measure mass (kg/g)

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Find all of the possible combinations of items by total mass. Includes 2 items per combination. Measures are given in both kg and g; multiples of 100.
Expected Find all of the possible combinations of items by total mass. Up to 3 items per combination. Measures are given in both kg and g; multiples of 5. Some measures are represented as fractions.
Greater Depth Find all of the possible combinations of items by total mass. Up to 3 items per combination. Measures given in both kg and g of any number. Some measures are represented as fractions.

Questions 2, 5 and 8 (Problem Solving)
Developing Find the mass of the items on a scale and explain what will happen to the balance if another item is added. Up to 2 items on each side; multiples of 100.
Expected Find the mass of the items on a scale and explain what will happen to the balance of another item is added. Up to 3 items on each side; multiples of 5. Some measures are represented as fractions.
Greater Depth Find the mass of the items on a scale and explain what will happen to the balance if another item is added. Up to 3 items on each side; any numbers used. Some measures are represented as fractions.

Questions 3, 6 and 9 (Reasoning)
Developing Find the odd one out between three models. Addition and subtraction calculations with up to 2 items. Masses in either kg or g; multiples of 100.
Expected Find the odd one out between three models. Addition and subtraction calculations with up to 3 items. Masses in either kg or g; multiples of 5. Some measures are represented as fractions.
Greater Depth Find the odd one out between three models. Addition and subtraction calculations with up to 3 items. Measures given in both kg and g of any number. Some measures are represented as fractions.

More Year 3 Mass and Capacity resources.

Did you like this resource? Don't forget to review it on our website.

Add and Subtract Mass

1a. Lukas wants to put these items on a hook. The maximum that the hook can hold is 1kg.

Find all of the possible combinations of two items he could put on the hook.

- Coat – 400g
- Backpack – 600g
- Briefcase – 500g
- Umbrella – 100g
- Hoodie – 300g

D PS

Add and Subtract Mass

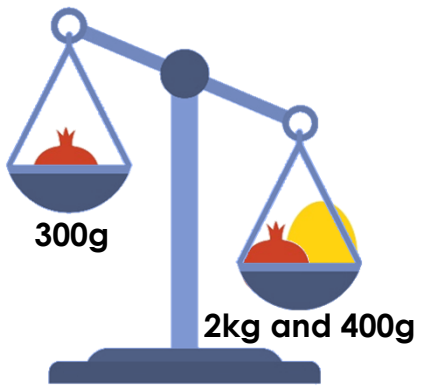
1b. Ethel wants to put these ornaments in her cabinet. The maximum that one shelf can hold is 3kg.

Find all of the possible combinations of two ornaments that she could put on one shelf.

- Swan ornament – 1kg and 300g
- Small fox ornament – 200g
- Ballerina ornament – 2kg and 400g
- Seahorse ornament – 1kg and 200g
- Elephant ornament – 1kg and 100g

D PS

2a. Xavier adds another pomegranate to the left side of the scale. Pomegranates weigh 300g. What will happen to the scale?

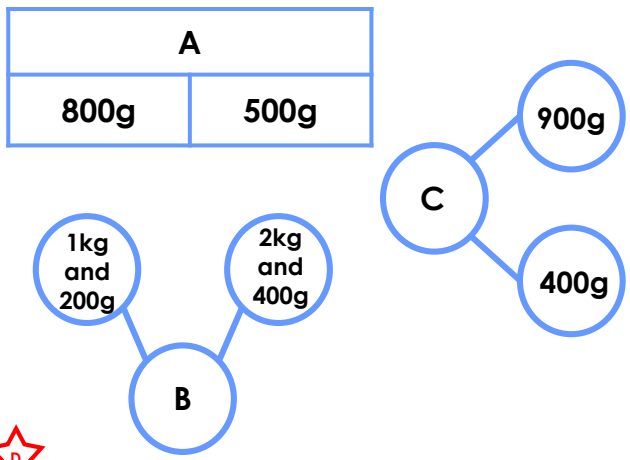


D PS

2b. Marsha adds another squash to the right side of the scale. A squash weighs 3kg 400g. What will happen to the scale?

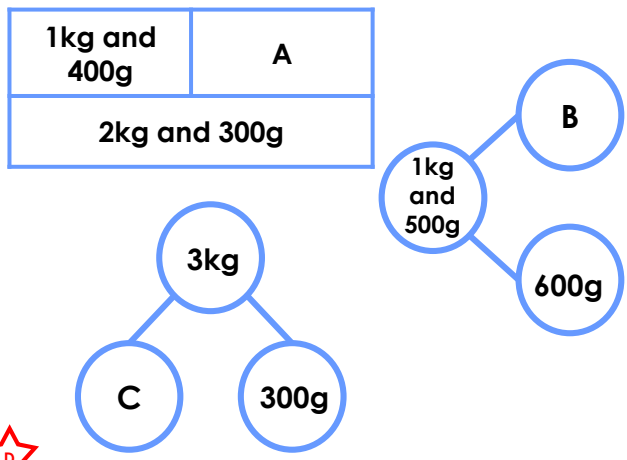
D PS

3a. Which missing weight is the odd one out – A, B or C? Convince me.



D R

3b. Which missing weight is the odd one out – A, B or C? Convince me.



D R

Add and Subtract Mass

4a. Henry wants to put these items on his shelf. The maximum that the shelf can hold is 2kg and 500g.
Find all of the possible combinations of three items he could put on his shelf.

- Sugar – 1kg and 150g
- Butter – $\frac{1}{2}$kg
- Icing sugar – 450g
- A box of eggs – 300g
- Plain flour – 1,200g
- Self-raising flour – 1kg and 700g

E PS

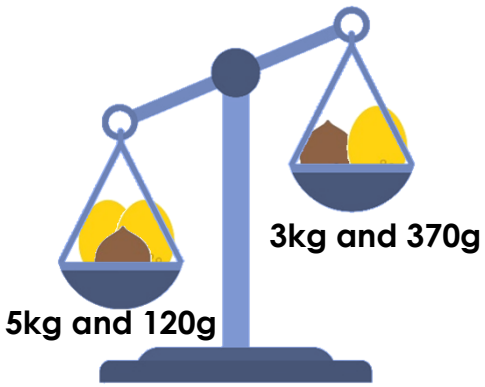
Add and Subtract Mass

4b. Misé wants to put these tools in her tool belt. The maximum that she wants to carry is 1kg and 330g.
Find all of the possible combinations of three tools that she could put in her belt.

- Spanner – 300g
- Screwdriver set – 850g
- Hammer – 1kg and 115g
- Pliers – 175g
- Tape measure – $\frac{1}{4}$ kg

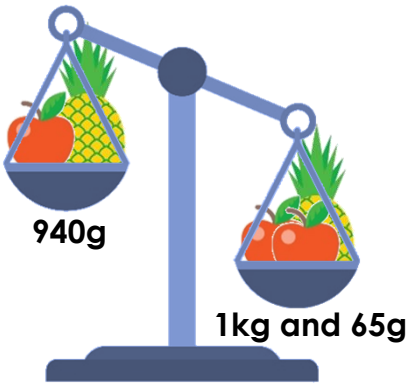
E PS

5a. Davina adds another coconut to the right side of the scale. What will happen to the scale?



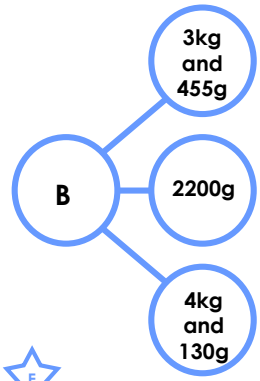
E PS

5b. Jamie adds another pineapple to the left side of the scale. What will happen to the scale?



E PS

6a. Which missing weight is the odd one out – A, B or C? Convince me.

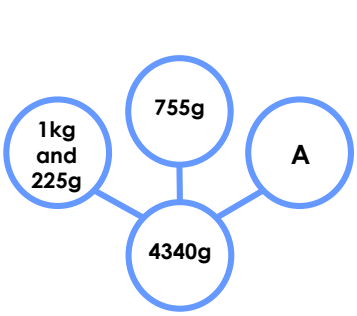


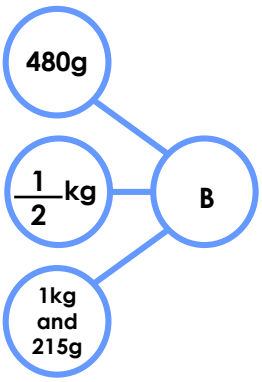
9kg and 600g	
A	2kg and 750g

C		
3kg and 730g	4kg and 555g	$1\frac{1}{2}$ kg

E R

6b. Which missing weight is the odd one out – A, B or C? Convince me.





4kg and 665g	1kg and 475g	C
$8\frac{1}{2}$Kg		

E R

Add and Subtract Mass

7a.

Urma wants to put these items on her roof rack. The maximum that the roof rack can hold is 25kg.
Find all of the possible combinations of three items she could put on her roof rack.

- Bike – 11kg and 618g
- Windbreak – 11kg and 836g
- Rucksack – 9kg and 513g
- Cool box – $5\frac{1}{4}$ kg
- Tent – $7\frac{1}{2}$ kg
- First aid kit – 1549g

GD PS

Add and Subtract Mass

7b.

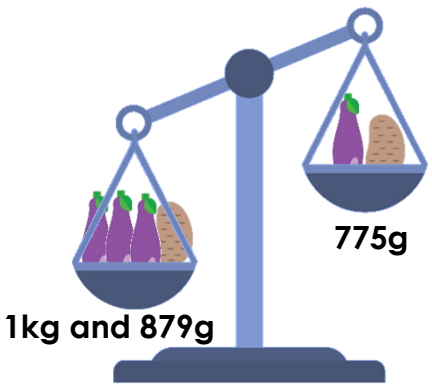
Yussuf wants to add more books to his bookshelf. The maximum weight is 20kg and he already has 15kg 500g on the bookshelf.
Find all of the possible combinations of three books that he could put on his bookshelf.

- Anthology of Insects – 1 kg and 831g
- Anthology of Mammals – 2,678g
- Dictionary – 1,009g
- The Buffalo – $\frac{1}{4}$ kg
- Gary the Potter – 819g
- The Thirsty Beetle – 129g

GD PS

8a.

India adds another two potatoes to the right side of the scale. What will happen to the scale?



GD PS

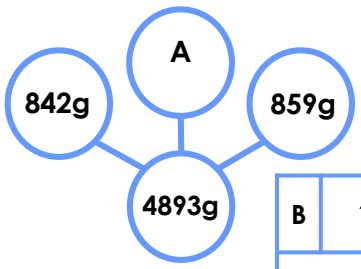
8b.

Ishmael adds another pumpkin to the left side of the scale. What will happen to the scale?

GD PS

9a.

Which missing weight is the odd one out – A, B or C? Convince me.



B	$1\frac{1}{4}$ kg	3kg and 116g
7kg 558g		

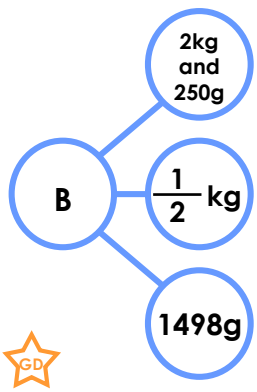
C		
1,291g	1kg and 372g	$\frac{1}{2}$ kg

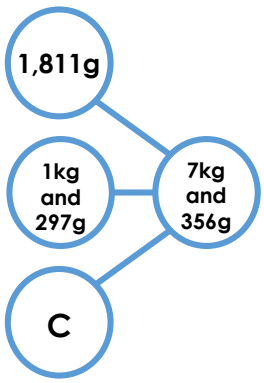
GD R

9b.

Which missing weight is the odd one out – A, B or C? Convince me.

$6\frac{1}{4}$ kg		
A	1,158g	3kg and 493g





GD R

Reasoning and Problem Solving
Add and Subtract Mass

Developing

1a. Various answers; for example: coat and backpack; briefcase and coat; umbrella and hoodie.

2a. Adding another pomegranate will not tip the scale because 300g + 300g = 600g. 600g < 2kg and 400g.

3a. B is the odd one out because it totals 3kg and 600g. A and C both total 1kg and 300g.

Expected

4a. Various answers; for example: butter, egg and plain flour; self-raising flour, eggs and icing sugar; sugar, eggs and butter.

5a. A melon must weigh 1kg and 750g because 5kg and 120g – 3kg and 370g = 1kg and 750g. A coconut must weigh 1kg and 620g because 3kg and 370g – 1kg and 750g = 1kg and 620g. So adding a coconut to the right side of the scale will not tip the balance because 3kg and 370g + 1kg and 620g = 4kg and 990g < 5kg and 120g.

6a. A is the odd one out because 9kg and 600g – 2kg and 750g = 6kg and 850g whereas B and C equal 9,785g or 9kg and 785g.

Greater Depth

7a. Various answers, for example: tent, first aid kit and cool box; cool box, rucksack and first aid kit; bike, first aid kit and rucksack.

8a. Two aubergines must weigh 1kg 104g because 1kg and 879g - 775g = 1kg and 104g so one aubergine must weigh 552g because half of 1kg and 104g = 552g. A potato must weigh 223g because 775g – 552g = 223g. Adding two potatoes to the right side of the scale will not tip the balance because 775g + 446g = 1kg 221g. 1kg and 879g > 1kg and 221g.

9a. C is the odd one out because 1kg and 291g + 1kg and 372g + 500g = 3kg and 163g whereas A and B both equal 3kg and 192g.

Reasoning and Problem Solving
Add and Subtract Mass

Developing

1b. Various answers; for example: swan and small fox; ballerina and small fox; elephant and swan.

2b. The scale will tip to the right because 3kg 400g + 3kg and 400g = 6kg and 800g. 6kg 800g > 6kg and 600g.

3b. C is the odd one out because it totals 2kg and 700g. A and C both total 900g.

Expected

4b. Various answers; for example: tape measure, pliers and spanner; screwdriver, pliers and tape measure; screwdriver, spanner and pliers.

5b. An apple must weigh 125g because 1kg = 1,000g and 1065 – 940 = 125g. A pineapple must weigh 815g. So adding a pineapple to the left side will make the scale tip to the left because 940g + 815g = 1kg and 755g > 1kg and 65g.

6b. B is the odd one out because 480 + 500 + 1,215 = 2,195 whereas A and C equal 2,360g or 2kg and 360g.

Greater Depth

7b. Various answers, for example: Anthology of Insects, The Buffalo and The Thirsty Beetle; Anthology of Insects, The Buffalo and Gary the Potter; Anthology of Insects, The Buffalo and dictionary.

8b. A melon must weigh 1kg and 241g because 8kg and 146g – 6kg and 905g = 1kg and 241g. A pumpkin must weigh 2kg and 832g because 6kg and 905g – 1kg and 241g = 5kg and 664g. Half of 5kg and 664g = 2kg and 832g. Adding a pumpkin to the left side will tip the scale to the left because 6kg and 905g + 2kg and 832g = 9kg and 737g. 9kg and 737g > 8kg and 146g.

9b. A is the odd one out because 3kg and 493g + 1kg and 158g = 4kg and 651g. 6kg and 250g – 4kg and 651g = 1kg and 599g whereas B and C both equal 4kg and 248g.