

Addition and Subtraction

Ready to Progress

Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
AS	1AS-1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	2AS-1 Add and subtract across 10.	3AS-1 Calculate complements to 100.			6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).
	1AS-2 Read, write and interpret equations containing addition (+), subtraction (−) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.	2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".	3AS-2 Add and subtract up to three-digit numbers using columnar methods.			6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
		2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.	3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.			6AS/MD-3 Solve problems involving ratio relationships.
		2AS-4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.				6AS/MD-4 Solve problems involving ratio relationships.

Example Assessment Questions

Taken from DFE Maths Guidance 2020

Addition and Subtraction

1AS-1

2AS-1

3AS-1

6AS/MD-1

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<u>1AS-1</u> Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	<u>2AS-1</u> Add and subtract across 10.	<u>3AS-1</u> Calculate complements to 100.			<u>6AS/MD-1</u> Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).

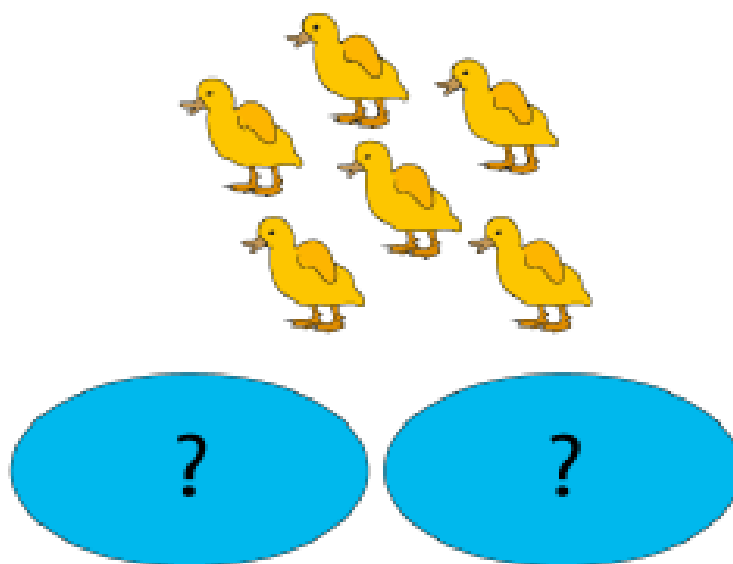
Year 1 – Addition and Subtraction

Ready to Progress Criterion:

1AS–1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.

1AS–1 Example assessment questions

1. Mother duck is in the water with her 6 ducklings. There are 2 ponds. How many ducklings could be in each pond?



2. Fill in the missing numbers.

a.

$$5 = 5 + 0$$



$$5 = 4 + \square$$



$$5 = 3 + \square$$



$$5 = 2 + \square$$



$$5 = 1 + \square$$



$$5 = 0 + \square$$



b.

$$7 + \square = 7$$

$$6 + \square = 7$$

$$5 + \square = 7$$

$$4 + \square = 7$$

$$3 + \square = 7$$

$$2 + \square = 7$$

$$1 + \square = 7$$

$$0 + \square = 7$$

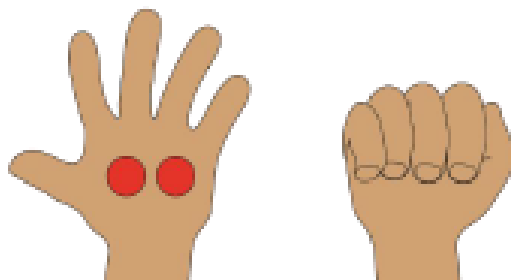
Year 1 – Addition and Subtraction (Continued)

Ready to Progress Criterion:

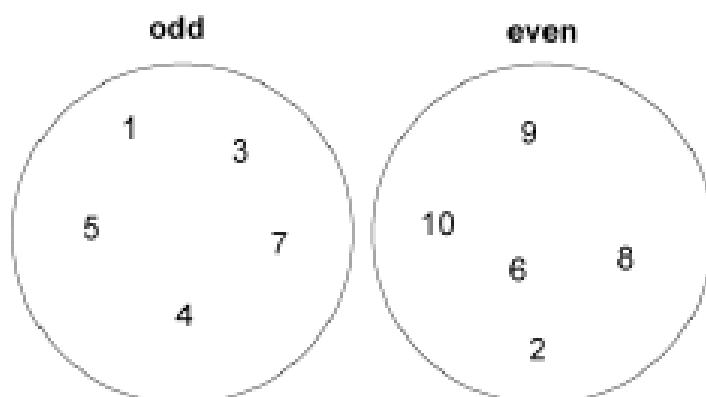
1AS–1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.

3. Task: Provide each pupil with a tens frame and counters in 2 colours, then ask pupils to use the manipulatives to answer questions such as the following.

"I am holding 9 counters altogether. How many counters are there in my closed hand?"



4. Underline the numbers that are in the wrong sorting circle.



5. Write the missing numbers in these odd and even sequences.

1	3			9
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2		6		10
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Assessment guidance: The focus of this criterion is understanding that numbers can be composed from, and partitioned into, smaller numbers. Pupils are assessed separately on their fluency in number facts within 10, in criterion **1NF–1**. Therefore manipulatives such as counters and tens frames, or counters and partitioning diagram templates, should be made available to pupils during assessment of this criterion so that the questions are not dependent on pupils' emerging number facts fluency.

Note that Example assessment question 2 relies on pupils having learnt to write and interpret addition and subtractions equations. This question should only be used to assess understanding of composition and partitioning after pupils have met criterion **1AS–2**.

Year 2 – Addition and Subtraction

Ready to Progress Criterion:

2AS–1 Add and subtract across 10.

2AS–1 Example assessment questions

1. Amisha spends £5 on a book and £8 on a T-shirt. How much does she spend altogether?
2. I have a 15cm length of ribbon. I cut off 6cm. How much ribbon is left?
3. I have 17 pencils. 9 have been sharpened. How many have not been sharpened?
4. A garden fence was 8m long. Then the gardener added 7 more metres of fencing. How long is the garden fence now?

Assessment guidance: For pupils to have met criterion 2AS–1, they need to be able to add and subtract across 10 without counting forwards or backwards in ones on their fingers, on a number line or in their heads. Teachers should assess pupils in small groups – simply providing the correct answers to the example questions above does not demonstrate that a pupil has met the criterion. The full set of addition and subtraction facts which children need to be fluent in is shown in the appendix.

Year 3 – Addition and Subtraction

Ready to Progress Criterion:

3AS–1 Calculate complements to 100.

3AS–1 Example assessment questions

1. Which of these are correct complements to 100 and which have an extra 10? Tick the correct column. Explain your answers.

	Correct bond to 100	Incorrect bond to 100 (extra 10)	Explanation
$28 + 72$			
$61 + 49$			
$55 + 45$			
$43 + 67$			
$84 + 16$			
$39 + 71$			

2. Fill in the missing numbers.

$$65 + \square = 100$$

$$100 - 29 = \square$$

$$100 = 42 + \square$$

$$\square = 100 - 83$$

3. A dressmaker had 1m of ribbon. Then she used 22cm of it. How many centimetres of ribbon does she have left?
4. A toy shop sells ping-pong balls for 85p each. If I use a £1 coin to pay for a ping-pong ball, how much change will I get, in pence?
5. Mr Jones has 100 stickers. 47 of them are gold and the rest are silver. How many are silver?

Year 6 – Addition and Subtraction

Ready to Progress Criterion:

6AS/MD–1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).

6AS/MD–1 Example assessment questions

1. Fill in the missing numbers.

$300 + \boxed{} = 1200$

$75 - 3 + \boxed{}$

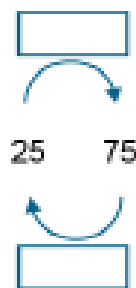
$\boxed{} + 0.1 = 10$

$300 \times \boxed{} = 1200$

$75 - 3 \times \boxed{}$

$\boxed{} \times 0.1 = 10$

2. Write an expression in each box to show the relationship between numbers 25 and 75. Is there more than one way to answer this question? Explain.



3. The examples below show the first 2 numbers in a sequence. Find 2 different ways to continue each sequence, using addition for the first and multiplication for the second.

a.

4	16	
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or

4	16	
---	----	--

b.

2	200	
---	-----	--

or

2	200	
---	-----	--

c.

0.01	10	
------	----	--

or

0.01	10	
------	----	--

4. Complete these sequences.

0.5	5	9.5				27.5	32
-----	---	-----	--	--	--	------	----

	0.5	0.75	1		
--	-----	------	---	--	--

	25	125	625		
--	----	-----	-----	--	--

0.2	6	180			
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Addition and Subtraction

1AS-2

2AS-2

3AS-2

6AS/MD2

<u>1AS-2</u> Read, write and interpret equations containing addition (+), subtraction (−) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.	<u>2AS-2</u> Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".	<u>3AS-2</u> Add and subtract up to three-digit numbers using columnar methods.			<u>6AS/MD-2</u> Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
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Year 1 – Addition and Subtraction

Ready to Progress Criterion:

1AS–2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.

1AS–2 Example assessment questions

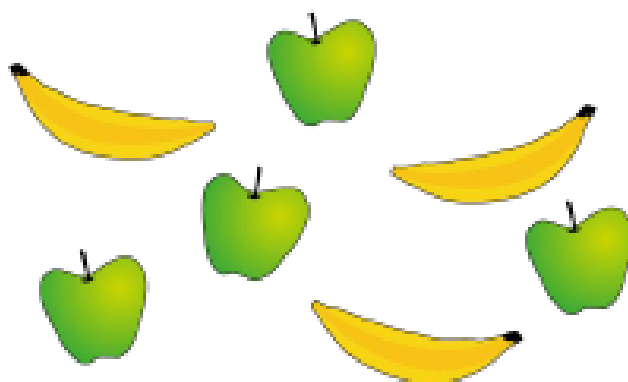
1. Write an equation to represent this story.

First I had 6 balloons. Then 2 floated away. Now I have 4 balloons.

2. Write an equation to represent this story.

There are 2 apples. There are 3 oranges. Altogether there are 5 pieces of fruit.

3. Which equation matches the picture? Can you explain your choice?



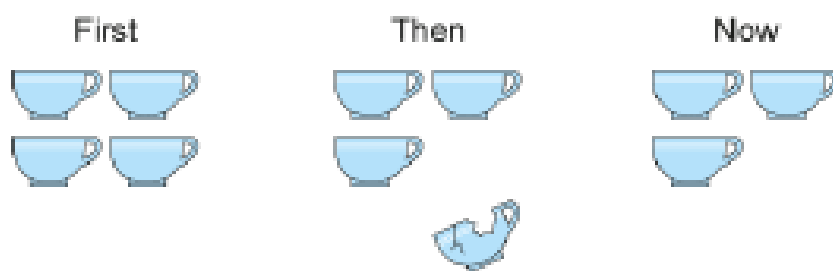
$$3 + 3 = 6$$

$$8 = 4 + 3$$

$$4 = 3 + 1$$

$$4 + 3 = 7$$

4. Holly looks at this picture. She writes $4 - 1 = 3$. Explain how Holly's equation represents the picture.



Year 1 – Addition and Subtraction (continued)

Ready to Progress Criterion:

1AS–2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.

5. Write an equation to represent this picture. Explain how your equation matches the picture.



Assessment guidance: For pupils to meet this criterion, they need to demonstrate mastery of the structures. Correct calculation of the solutions to calculations is not required (this is assessed in 1NF–1).

Where a question requires pupils to explain their reasoning, this should be done verbally.

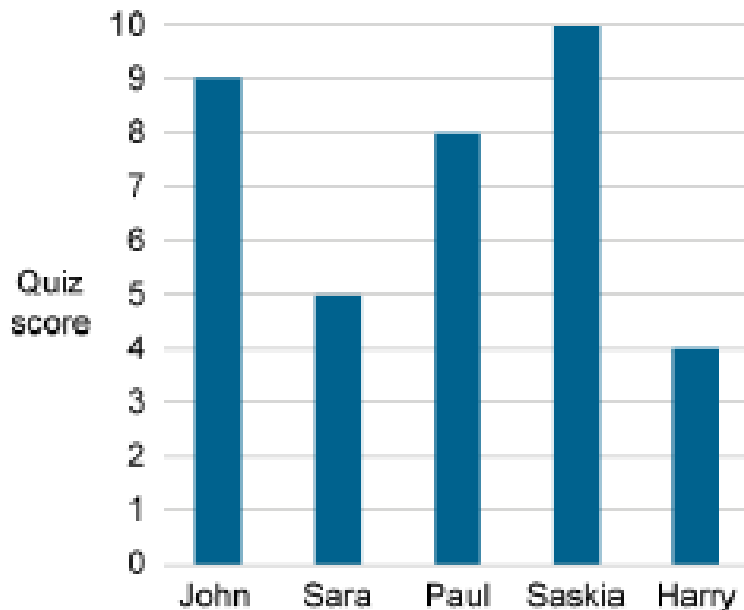
Year 2 – Addition and Subtraction

Ready to Progress Criterion:

2AS–2 Recognise the subtraction structure of ‘difference’ and answer questions of the form, “How many more...?”.

2AS–2 Example assessment questions

1. The bar chart shows how many points some pupils scored in a quiz.



- How many more points did John score than Sara?
 - How many fewer points did Harry score than Saskia?
 - What is the difference between Saskia's score and Paul's score?
- I have £19 and want to buy a game which costs £25. How much more money do I need?
 - Felicity has 34 marbles and Dan has 30 marbles. What is the difference between the number of marbles they have?
 - It takes me 20 minutes to walk to school. So far I have been walking for 12 minutes. How much longer do I have to walk for?
 - Liam is 90cm tall. Karim is 80cm tall. How much taller is Liam than Karim?

Year 3 – Addition and Subtraction

Ready to Progress Criterion:

3AS–2 Add and subtract up to three-digit numbers using columnar methods.

3AS–2 Example assessment questions

1. Solve these calculations using columnar addition or columnar subtraction.

a. $89 - 23$

c. $402 + 130 + 78$

e. $345 - 72$

b. $127 + 43 + 49$

d. $462 - 256$

f. $407 - 129$

2. Year 3 want to buy some sports equipment which costs £472. So far they have raised £158. How much more money do they need to raise?

3. Cheryl has £135. She spends £53 on some new trainers. How much money does she have left?

4. There are 172 non-fiction books in the school library and 356 fiction books. How many books are there in the library altogether?

5. Fill in the missing numbers.

$$\begin{array}{r} 262 \\ + 3\boxed{}1 \\ \hline 583 \end{array}$$

$$\begin{array}{r} 322 \\ + 16\boxed{} \\ \hline 491 \end{array}$$

$$\begin{array}{r} 627 \\ - 11\boxed{} \\ \hline 514 \end{array}$$

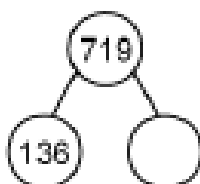
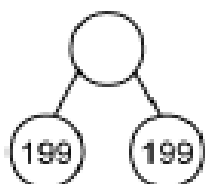
$$\begin{array}{r} 7\boxed{}4 \\ - 62 \\ \hline \boxed{}32 \end{array}$$

6. Mahsa carries out the following columnar addition calculation.

$$\begin{array}{r} 628 \\ + 159 \\ \hline 787 \\ 1 \end{array}$$

Write a columnar subtraction calculation that she could do to check that her calculation is correct.

7. Complete the following calculations. Choose carefully which method to use.



$175 + 25$

$776 - 200$

$63 + 89 + 42$

$523 - 247$

$50 + 250 + 300$

$400 - 35$

Year 6 – Addition and Subtraction

Ready to Progress Criterion:

6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.

6AS/MD–2 Example assessment questions

1. Fill in the missing numbers.

$$327 + 278 = 330 + \boxed{}$$

$$25 \times 48 = 50 \times \boxed{}$$

2. $327 + 515 = 842$

Use this calculation to complete the following equations.

$$\boxed{} + 61.5 = 84.2$$

$$8,420 - \boxed{} = 3,270$$

$$85,200 - 52,500 = \boxed{}$$

3. $21,760 = 256 \times 85$

Use this calculation to complete the following equations.

$$256 \times 8.5 = \boxed{}$$

$$2,560 \times 85 = \boxed{}$$

$$2,156 \div 85 = \boxed{}$$

4. $3,128 \div 23 = 136$

Use the division calculation to solve the following calculation. Explain your answer.

$$24 \times 138 = \boxed{}$$

5. Fill in the missing number.

$$25 \times 60 = \boxed{} \times 60 + 120$$

Addition and Subtraction

2AS-3

3AS-3

6AS/MD-3

	<u>2AS-3</u> Add and subtract within 100 by applying related one-digit addition and subtraction facts; add and subtract only ones or only tens to/from a two-digit number.	<u>3AS-3</u> Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.			<u>6AS/MD-3</u> Solve problems involving ratio relationships.
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Year 2 – Addition and Subtraction

Ready to Progress Criterion:

2AS–3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.

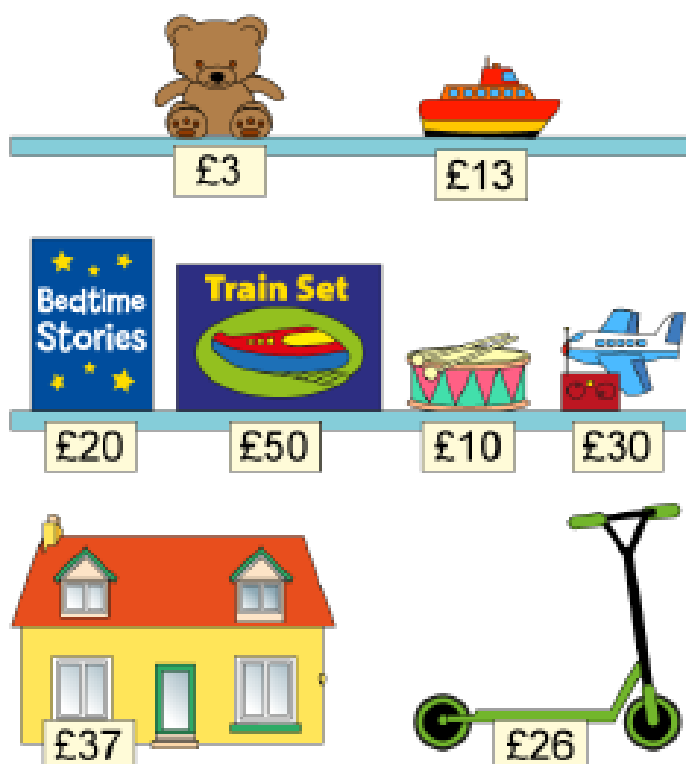
2AS–3 Example assessment questions

1. A bouncy ball costs 80p. Circle the coins which you could use to pay for it. Is there more than one answer?



2. Sophie's book has 50 pages. So far she has read 9 pages. How many more pages does Sophie have left to read?

3.



Year 2 – Addition and Subtraction

Ready to Progress Criterion:

2AS–3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.

What is the total cost of:

- a. the bedtime stories book and the train set?
 - b. the doll's house and the plane?
 - c. the scooter and the teddy?
 - d. the boat, the train set and the drum?
4. Oak class raise £88 for their class fund. They spend £40 on new paints. How much money do they have left?

Assessment guidance: Simply providing the correct answers to the example questions above does not demonstrate that pupils have met criterion 2AS–3. For pupils to meet the criterion, they must be able to use known addition and subtraction facts within 10 to solve the calculations efficiently. Before using the questions above, assess pupils in small groups by watching how they solve calculations such as:

$40 + 30$

$31 + 5$

$20 + 59$

$46 + 4$

$90 - 40$

$48 - 6$

$72 - 30$

$80 - 3$

Language focus

"I know that 2 plus 5 is equal to 7, so 20 plus 50 is equal to 70. There are 9 ones as well, so 20 plus 59 is equal to 79."

Pupils who are using extensive written notes (for example, sketching 'jumping back' in tens on a number line as a way to solve $90 - 40$) have not yet met criterion 2AS–3.

Year 3 – Addition and Subtraction

Ready to Progress Criterion:

3AS–3 Manipulate the additive relationship:

Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.

3AS–3 Example assessment questions

Fill in the missing numbers.

$$364 + \square = 857$$

$$\square - 785 = 180$$

$$145 = 721 - \square$$

$$250\text{cm} = 65\text{cm} + \square$$

Missing-addend problems	Type of problem: missing part Rewrite the addition equation as a subtraction equation, for example: $329 + \square = 743 \rightarrow 743 - 329 = \square$ Language focus "There is a missing part. To find the missing part, we subtract the other part from the whole."
Missing-subtrahend problems	Type of problem: missing part Rewrite the subtraction equation by swapping the subtrahend and the difference, for example: $477 - \square = 285 \rightarrow 477 - 285 = \square$ Language focus "There is a missing part. To find the missing part, we subtract the other part from the whole."
Missing-minuend problems	Type of problem: missing whole Rewrite the subtraction equation as an addition equation, for example: $\square - 527 = 87 \rightarrow 527 + 87 = \square$ Language focus "There is a missing whole. To find the missing whole, we add the 2 parts."

Year 6 – Addition and Subtraction

Ready to Progress Criterion:

6AS/MD–3 Solve problems involving ratio relationships.

6AS/MD–3 Example assessment questions

- For every 1 litre of petrol, Miss Smith's car can travel about 7km.
 - How many kilometres can Miss Smith's car travel on 6 litres of petrol?
 - Miss Smith lives about 28km from school. How many litres of petrol does she use to get to school?
- For every 3m of fence I need 4 fence panels. The fence will be 15m long. How many fence panels will I need?
- I am decorating a cake with fruit. I use 2 raspberries for every 3 strawberries. Altogether I put 30 berries on the cake.
 - How many raspberries did I use?
 - How many strawberries did I use?
- For every 500g of excess baggage I take on an aeroplane, I must pay £7.50. I have 3.5kg of excess baggage. How much must I pay?
- Lily and Ralph are eating grapes. The diagram represents the relationship between the number of grapes that the children eat.

number of grapes
that Lily eats:

number of grapes
that Ralph eats:

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Fill in the missing numbers.

Number of grapes that Lily eats	Number of grapes that Ralph eats
1	
	20
3	

- Giya is planting flowers in her garden. For every 5 red flowers she plants, she plants 3 yellow flowers. If Giya plants 18 yellow flowers, how many red flowers does she plant?
- I am making a necklace. So far, it has 4 black beads and 1 white bead. How many more white beads would I need to add so that there are 4 white beads for every 1 black bead?

Addition and Subtraction

2AS-4

6AS/MD-4

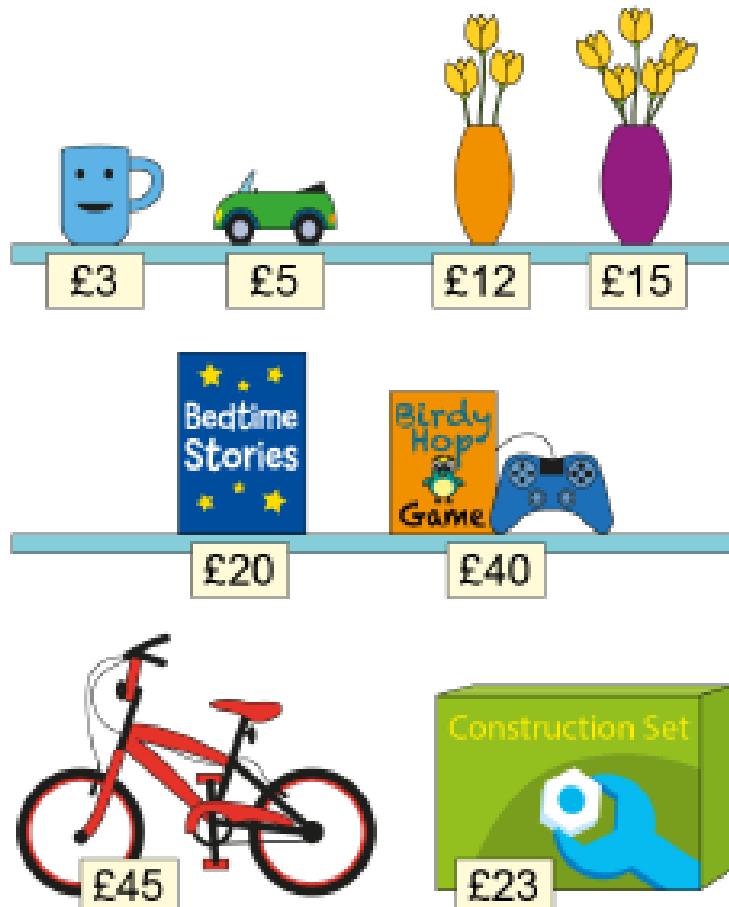
Year 2 – Addition and Subtraction

Ready to Progress Criterion:

2AS–4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.

2AS–4 Example assessment questions

1.



- Daisy spends £32 in the shop. Circle the 2 items she buys.
- What is the total cost of the bicycle and construction set?
- Jalal pays for the bicycle using a £50 note. How much change does he get?
- Yu Yan wants to buy the construction set. She has saved £15. How much more money does Yu Yan need to save?

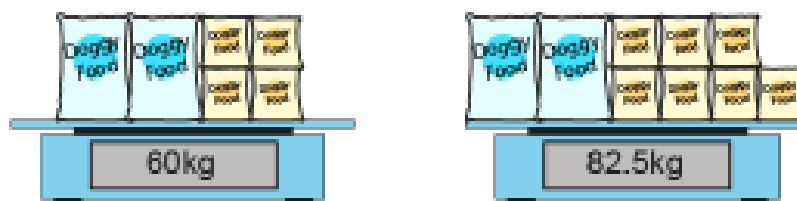
Year 6 – Addition and Subtraction

Ready to Progress Criterion:

6AS/MD–4 Solve problems with 2 unknowns.

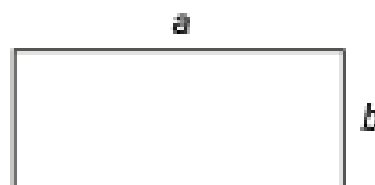
6AS/MD–4 Example assessment questions

1. A baker is packing 60 cakes into boxes. A small box can hold 8 cakes and a large box can hold 12 cakes.
 - a. How many different ways can he pack the cakes?
 - b. How can he pack the cakes with the fewest number of boxes?
2. 1 eraser and 5 pencils cost a total of £3.35.
5 erasers and 5 pencils cost a total of £4.75.
 - a. How much does 1 eraser cost?
 - b. How much does 1 pencil cost?
3. An adult ticket for the zoo costs £2 more than a child ticket. I spend a total of £33 buying 3 adult and 2 child tickets.
 - a. How much does an adult ticket cost?
 - b. How much does a child ticket cost?
4. The balances show the combined masses of some large bags of dog food and some small bags of dog food.



How much does each bag-size cost?

5. A rectangle with side-lengths a and b has a perimeter of 30cm. a is a 2-digit whole number and b is a 1-digit whole number. What are the possible values of a and b ?



Year 6 – Addition and Subtraction (Continued)

Ready to Progress Criterion:

6AS/MD–4 Solve problems with 2 unknowns.

6. The diagram shows the total cost of the items in each row and column. Fill in the 2 missing costs.

			£1.15
			£1.25
			95p
		95p	