HeadStart primary

PROBLEM SOLVING AND REASONING

YEAR 1

Part 2

Name:

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Published by HeadStart Primary Ltd 2021 © HeadStart Primary Ltd 2021

Guidance

YEAR 1: PROBLEM SOLVING AND REASONING

Introduction - National Curriculum

This booklet is Part 2 of a 3-booklet series covering all the 'matters, skills and processes' specified in the Mathematics National Curriculum. These 'matters, skills and processes' are often referred to as 'learning objectives' or 'learning outcomes'.

Solving problems and mathematical reasoning in context are difficult skills for children to master; a real-life, written problem is an abstract concept and children need opportunities to practise and consolidate their problem solving techniques.

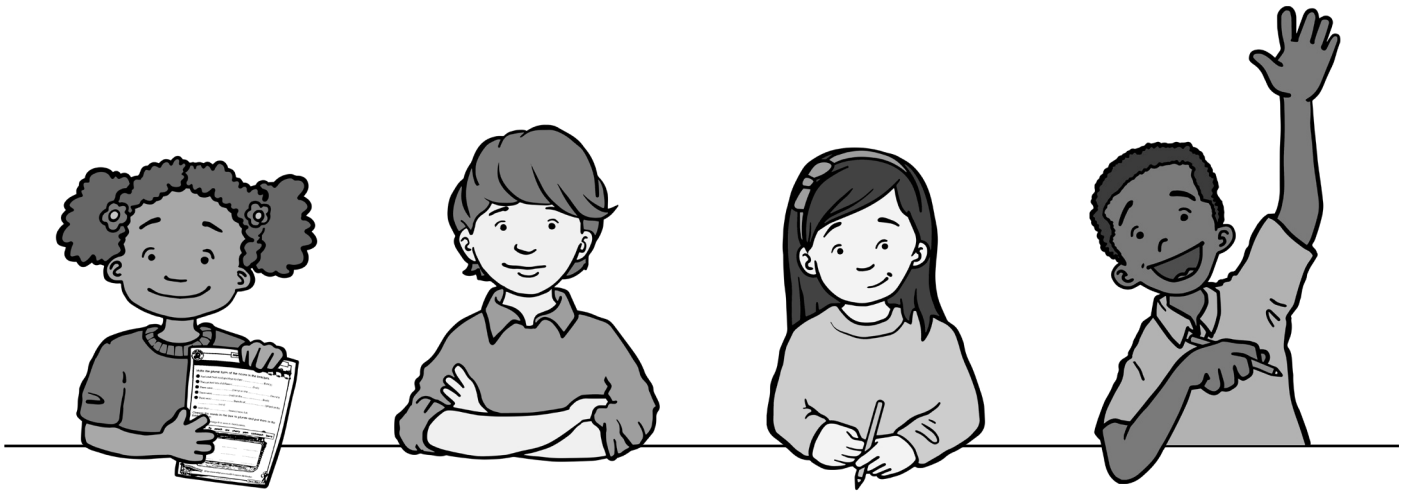
The specific objectives covered in this booklet are identified on the contents page.
The 3 booklets in the series cover all the National Curriculum objectives for Year 1.

Content of the booklet

The first section of each content domain is intended to provide opportunities for children to practise and consolidate their problem solving skills. Each page has an identified objective from the National Curriculum; the difficulty level of the questions increases towards the bottom of each page, thus providing built-in differentiation.

The MASTERING sections provide extra challenges as children's problem solving skills and confidence increase. The problems in the MASTERING sections encompass several objectives from the relevant curriculum domain.

It may be appropriate for children to use exercise books or paper to record any necessary working out.



CONTENTS

Year 1

PART 2

MASTERING

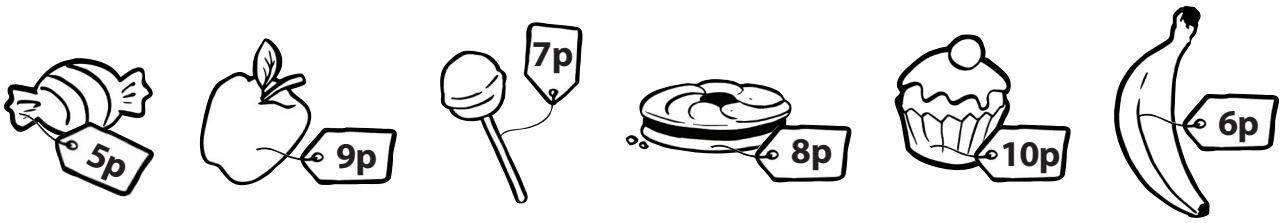
Addition and subtraction

Throughout this booklet, 6 children are solving problems. Their names are Rose, Ali, Usma, Jing, Olivia and Matt.

1 Ali has these coins. How much money does he have altogether?

p

2 I have **15p** to spend.
I want to buy **two** items.
Sort the items into pairs that can be bought with exactly **15p** and those which would need change.



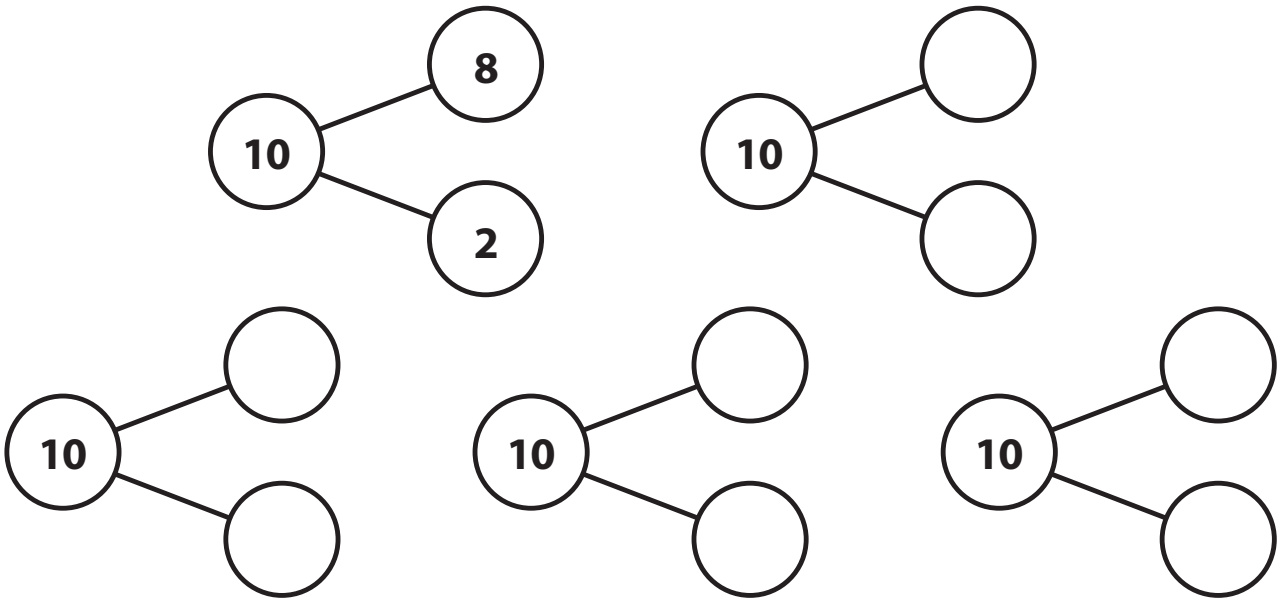
One has been done for you.

Exactly 15p
cake and sweet

Change needed

Name .....

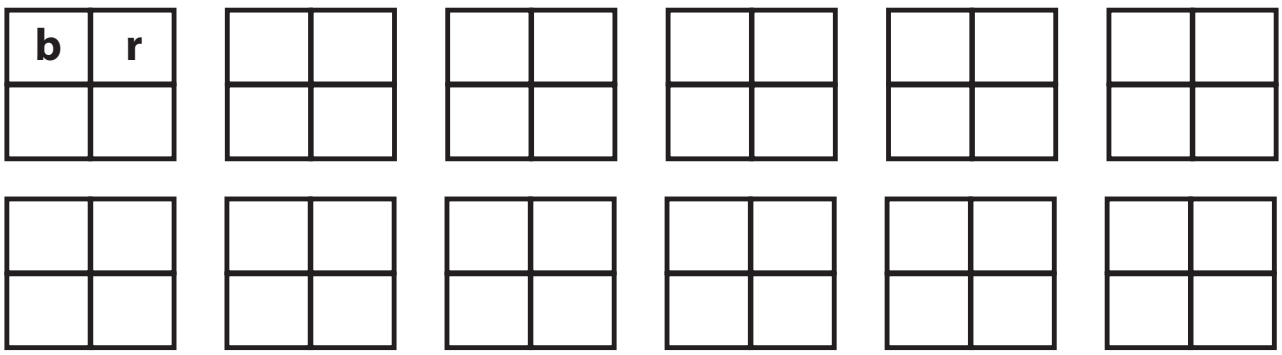
3 How many ways can you complete this?
One has been done for you.



4 Year 1 are designing new flags for their classroom.
Each flag has four small squares.
One square needs to be coloured blue and one square needs to be coloured red.

Write **b** or **r** in the squares to make as many different flags as you can.

One has been done for you.



Name .....

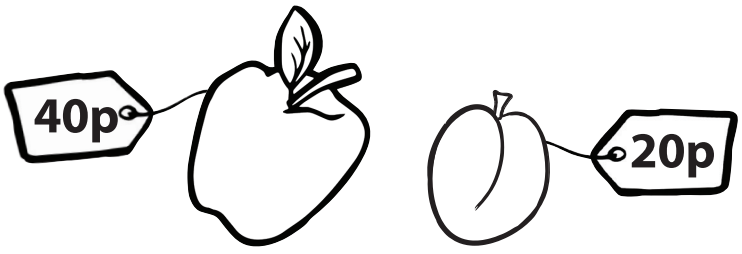
5 Matt added **two** numbers together. His total was **12**. What **two** numbers might he have used? Fill in the boxes to show the possible pairs of numbers.

☐ + ☐ ☐ + ☐

☐ + ☐ ☐ + ☐

☐ + ☐ ☐ + ☐

6 Rose wants to buy an apple and a plum.
She has **50p**.
How much more money does she need?



☐ **p**

Name .....

7 Rose said, "**4 + 0 = 4**".
Olivia said, "If you add something to a number it makes it bigger so **4 + 0 =** more than **4**." Who is correct?

Rose / Olivia

Explain your answer.

.....

.....

8 Matt has **7** conkers. Ali has **12** conkers. How many more conkers does Ali have than Matt?

9 Ali and Rose have some pencils.
Ali has **3** fewer pencils than Rose. Rose has **15** pencils.
How many pencils do they have altogether?

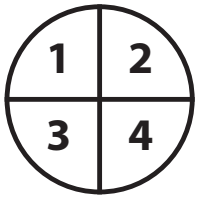
10 There are **5** children away from school in Year 1 and **7** children away from school in Year 2.

a) How many children are away from school in Year 1 and Year 2 in total?

b) Write a number sentence to show how you could work this out.
Choose from the symbols **+**, **–**, **=**

Name .....

11 Jing is playing darts.
He has **three** darts.
More than **one** dart can go into the same section on the dart board.



a) What is the highest score he can make?

b) What is the lowest score he can make?

c) What is the highest score he can make if each dart goes into a different section?

d) What is the lowest score he can make if every dart goes into a different section?

12 It is Ali's birthday. He brings some sweets to school to give to his friends. Ali has **17** sweets.

a) He gives away **8**. How many sweets has he got left?

b) Write a number sentence to show how you could work this out.
Choose from the symbols **+**, **−**, **=**

Name .....

13 Look at these number cards. Choose **one** to make each of these calculations correct.

6	4	7	2	3

6 + ☐ = **10**

10 – ☐ = **3**

14 Olivia has **12** pencils. Rose has **4** more pencils than Olivia.

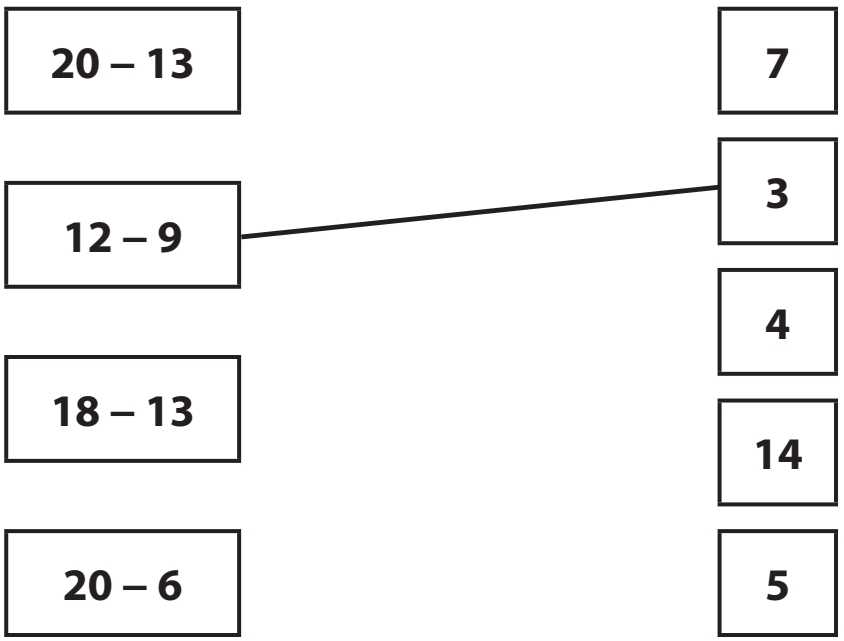
a) How many pencils does Rose have?

b) Write a number sentence to show how you could work this out. Choose from the symbols **+**, **–** and **=**

15 Usma bought **7** pencils. She gave **4** to Ali and **2** to Olivia. How many pencils did Usma have left?

Name .....

16 Draw lines to join these subtractions to their answers. One has been done for you.



17 I know that **5 + 7 = 12**. Write **two** other number facts using these numbers.

☐ + ☐ = ☐ ☐ – ☐ = ☐

18 Write **four** number sentences that link these **3** numbers: **5, 3, 8**.

☐ + ☐ = ☐ ☐ – ☐ = ☐

☐ + ☐ = ☐ ☐ – ☐ = ☐

Name .....

19 Usma has completed some calculations.
She has made some mistakes.
Work out if each calculation is correct or incorrect.
Put a ring around your answer.
If it is incorrect, write what the answer should be.

			Correction
a	5 + 6 = 11	correct / incorrect	
b	14 – 5 = 10	correct / incorrect	
c	12 + 7 = 20	correct / incorrect	
d	17 – 9 = 8	correct / incorrect	

20 Write numbers in the boxes to make these number sentences correct.

13 + 5 = 4 + ☐

12 – 7 = 3 + ☐

9 + 6 = 14 + ☐

Name .....

21 I know that **2 + 8 = 10**. How can I use this fact to work out **3 + 8**?

.....

.....

22 I am thinking of a number. If I subtract **9** from my number, I am left with **3**. What is my number?

23 Write the missing numbers. One has been done for you.

7 → **double then subtract 4** → **10**

10 → **double then subtract 4** → ☐

3 → **double then subtract 4** → ☐

9 → **double then subtract 4** → ☐

Name .....

24 Usma adds together **6** and **8**.
The total is **14**.
Write a different pair of numbers in the boxes to add up to **14**.
How many pairs can you find?

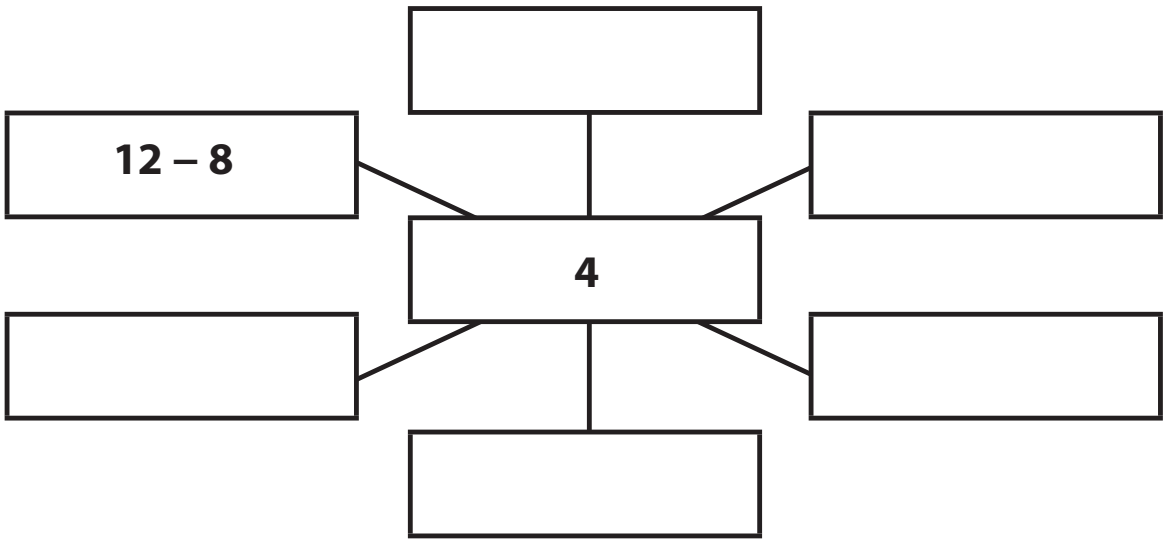
8	+	6	=	14		+		=	14
	+		=	14		+		=	14
	+		=	14		+		=	14
	+		=	14		+		=	14

25 Matt is playing cricket.
He can score 1 run, 2 runs or 4 runs each time.
He has scored 5 runs so far.
How might he have done this?
One way has been done for you.

1 run	2 runs	4 runs	Total
1	2		1 + 4 = 5 runs

Name .....

26 Usma knows that **12 – 8** is equal to **4**.
Fill in the other boxes with calculations with the answer **4**.



27 The children in Mrs Bradley's group have been asked to make some numbers. They can choose from these digit cards:

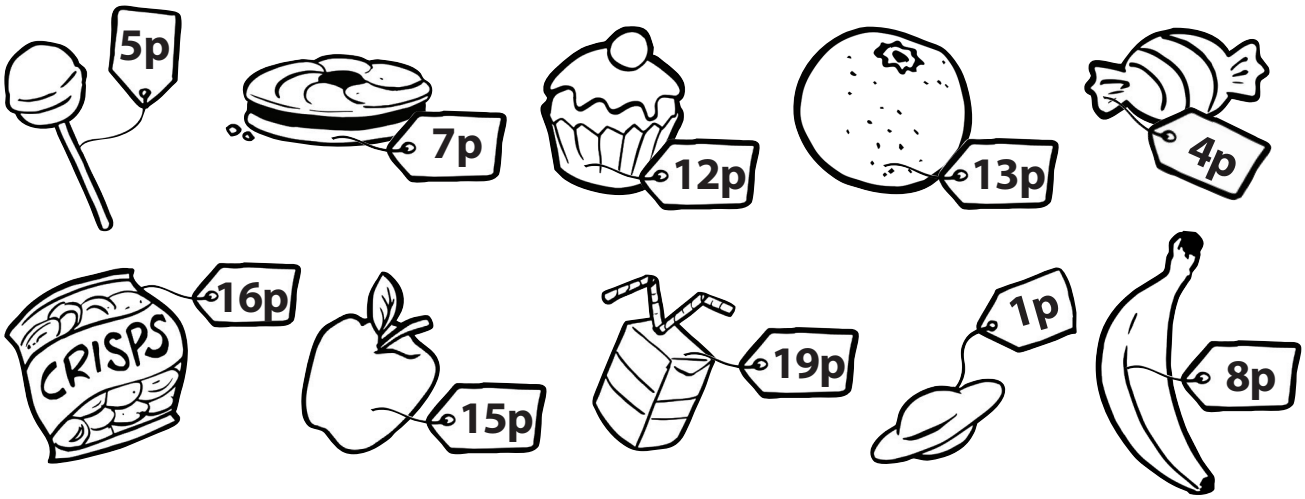
1	2	3	4	5

Show how each child could make their total.
One has been done for you.

Olivia 8	Matt 6	Rose 3	Ali 4	Usma 7
3 + 5				

Name .....

28 I have **20p** to spend.



Which **two** items could I buy for exactly **20p**?

and

---

29 Which **three** different items could I buy for exactly **20p**?

and

and

---

30 Which **four** different items could I buy for exactly **20p**?

and

and

Name .....

31 I am thinking of a number.
If I add **7** to my number, I get **15**.
What is my number?

---

32 Olivia, Rose and Usma each bring a different **even** number of pens to school.
Altogether they have **16** pens.
How many pens did they each bring in?
Can you think of more than one way to do this?

Olivia		Rose		Usma		TOTAL
	+		+		=	16
	+		+		=	16

---

33 Write the number that is **10** bigger than each of these numbers.

27 → ☐

12 → ☐

39 → ☐

45 → ☐

Name .....

34 Ali walked to Matt's house for his birthday party.
It took him **20 minutes**.
After the party, Ali ran home.
It took him **15 minutes**.
How much longer did it take Ali to walk than to run?

☐ **minutes**

35 **10 + 4 + 4 = 18**.
Make **18** by adding **three** numbers together in **2** different ways.

☐ + ☐ + ☐ = **18**

☐ + ☐ + ☐ = **18**

36 Jing thinks of a number.
He subtracts **12** from it. He is left with **4**.
What number did he think of first?

☐

37 Usma thinks of a number.
She adds **9** to it.
She gets **17**.
What number did she think of first?

☐

38 Rose thinks of a number.
She adds **4** to it and then adds another **6**.
She gets **16**.
What number did Rose think of first?

☐

Name .....

39 Ali threw a paper aeroplane. It flew **16 metres**.
Matt threw a different paper aeroplane. It flew **9 metres**.
How much further did Ali's aeroplane travel than Matt's aeroplane?

☐ **metres**

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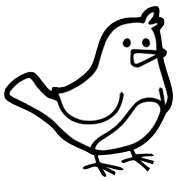
40 Olivia counted **16** birds on the playground. By playtime, **7** birds had flown away.

a How many birds were left on the playground?

☐



At lunchtime, there were **3** birds on the playground.

b How many more birds had flown away?

☐

---

41 Imagine a dice numbered **1 - 6**.
You can use any of these numbers to find a total of **7**.
How many ways can you do this?
Write a number sentence for each one.

☐ + ☐ = ☐ ☐ + ☐ = ☐

☐ + ☐ = ☐ ☐ + ☐ = ☐

Name .....

42 Usma has written a number sentence.
She has missed out the operation and sign.
Fill in the boxes to make Usma's number sentence correct.

20 ☐ **6** ☐ **14**

---

43 Write numbers in the boxes to make **15**.

☐ + ☐ = **15** ☐ + ☐ = **15**

☐ + ☐ = **15** ☐ + ☐ = **15**

☐ + ☐ = **15** ☐ + ☐ = **15**

☐ + ☐ = **15** ☐ + ☐ = **15**

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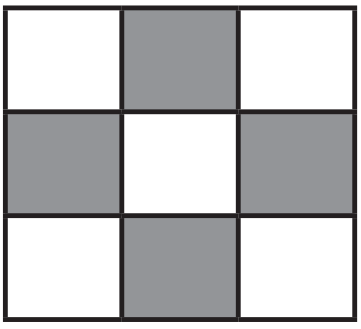
44 Put the numbers **1 - 5** into the white boxes. You can use each number only once.
Each diagonal line of 3 must add up to the same number.
What number do the diagonals add up to?



☐

Name .....

NUMBER

Multiplication and division

Double numbers and quantities

1 What is **double 1**?

2 Usma says, "**Double 3** is **6**." Is she correct? Explain your answer.

Yes / No

.....

.....

3 Rose has **2** cupcakes. Olivia has **double** that amount. How many cupcakes does Olivia have?

4 Mr Davies asks Matt to **double 5**. What number should he say?

5 Ali says, "If you **double 6**, the answer is **14**." Is he correct?

Explain your answer.

Yes / No

.....

.....

Name .....

Double numbers and quantities

1. Matt scores **2** goals playing football. Ali scores **double** that number of goals. How many goals does Ali score?

2. What is **double 4**?

3. Olivia eats **6** grapes. Rose eats **double** that amount. How many grapes does Rose eat?

4. Jing is **7**. His brother is **double** his age.
How old is his brother?

5. Miss Robinson asks her class to **double 13**.
What should their answer be?

Name .....

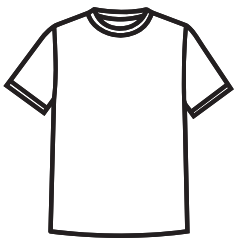
Double and halve numbers and quantities

1. **4** players are split into **two** teams. How many people are in each team?

2. What is **half** of **6**?

3. **Half** of a number is **4**. What is the number?

4. A **£10** shirt is **half** price in a sale. How much is it now?



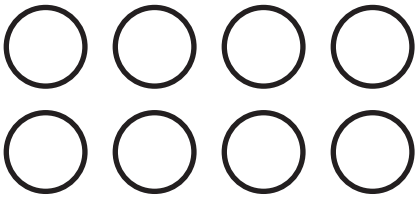
£

5. Ali thinks of a number and then **doubles** it. His answer is **16**. What was the number?

Name .....

Use arrays to solve one-step multiplication problems

1 Look at this array.

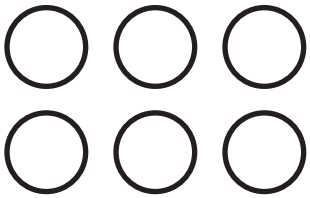


Circle the multiplication statement that it shows.

4 × 2 = 8 or **3 × 2 = 6**

---

2 Write a multiplication statement for this array.

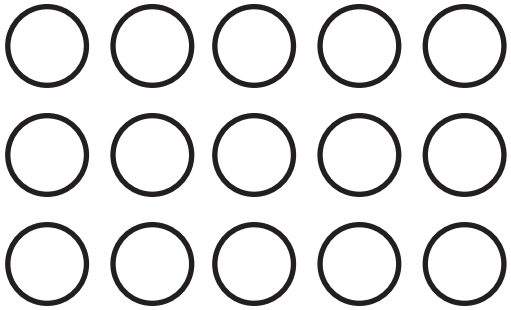


□ × □ = □

---

3 Rose thinks that this array shows **3 × 6 = 18**.
Is she correct?

Yes / No



Explain your answer.

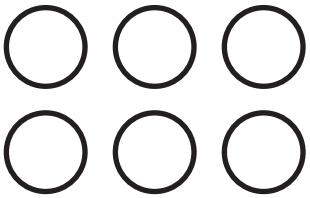
.....

.....

Name .....

Use arrays to solve one-step multiplication problems

1

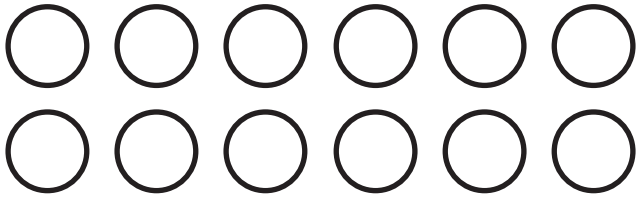


Circle the number statement that this array shows.

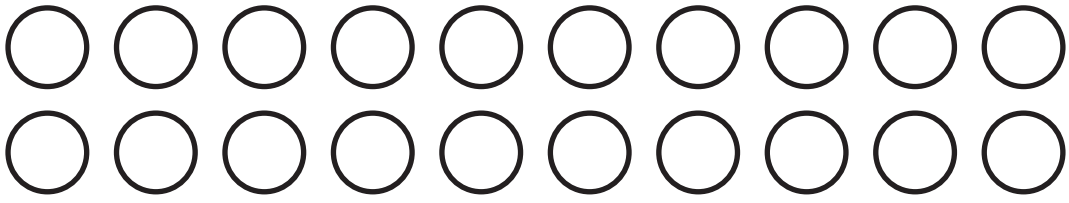
3 × 4 = 12 or **3 × 2 = 6**

2 Draw counters to show **2 × 2 = 4**.

3 In Ali's garden, he has **2** rows of **6** carrots. How many carrots does he have? Use the array to help you.



4 Write **two** multiplication statements for this array.



□ × □ = □ □ × □ = □

Name .....

Solve problems involving grouping or sharing

1. How many pairs of socks can you make from **6** socks?

2. There are **20** children in the school hall. How many groups of **10** children can their teacher make?

3. Olivia has **10** cakes. She shares them equally between herself and Jing. How many cakes do they each have?

4. One packet contains **10** coloured pencils. There are **5** different colours. How many pencils of each colour are there in one packet?

5. **Thirty** counters are split into **five** groups. How many counters are there in each group?

Name .....

Solve problems involving grouping or sharing

1. Freddie's Fruit Shop has **12** oranges. He puts **4** in each box. How many boxes can he make?

2. **Twelve** sweets are shared between **three** children.
How many sweets do they each get?

3. There are **25** children in a class. How many groups of **five** children can be made?

4. Mrs Johnson has **30** new reading books. She shares them between **10** children. How many books does each child have?

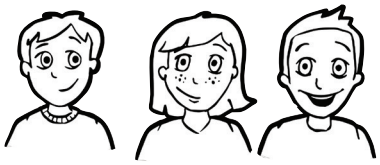
5. Draw **2** different ways that **20** counters can be arranged into an array.

Name .....

Solve problems involving grouping or sharing (money)

1. Usma has **10p** in **two pence** coins. How many coins does she have?

2. Grandma shares **£30** between her **3** grandchildren. How much do they each get?



£

3. Ali wants to put his **14** pennies into sets of **2** pennies. How many sets can he make?

4. A shirt costs **£10**. How many shirts could Mr Harrison buy with **£40**?

5. How many **5p** coins would equal **60p**?

Name .....

Solve problems involving grouping or sharing (money)

1. In Mum's purse she has **50p** in **ten pence** coins.
How many coins does she have?

2. Mrs Jackson shares **£20** between her **4** children. How much money do they get each?

£

3. Choc ices cost **10p** each. How many can you buy with **70p**?

4. **£16** is shared between **eight** people. How much money do they get each?

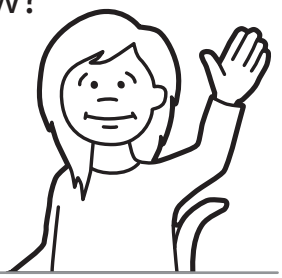
£

5. Ali wants to buy a comic for **60p**. How many **10p** coins does he need?

Name .....

Make connections between number patterns and counting in twos, fives and tens

1 What comes next in Olivia's pattern of numbers below?



4 **6** **8** ☐

---

2 What number is missing in Rose's number pattern below?

22 **20** **18** ☐ **14**

---

3 Matt counts on in **fives** from the number **22**. What are the next **2** numbers he counts?

☐ ☐

---

4 What number is **10** less than **33**?

☐

---

5 Jing writes a pattern of numbers below. What will his next **two** numbers be?

90 **80** **70** ☐ ☐

Name .....

Make connections between number patterns and counting in twos, fives and tens

1 Which numbers has Rose missed out from this pattern?

20 **25** ☐ **35** ☐

2 Usma is counting in **twos**. She starts at **10**. What are her next **3** numbers?

☐ ☐ ☐

3 Can you help Olivia fill in the missing numbers in this pattern?

32 ☐ **36** ☐ **40**

4 Matt is counting in **fives**. He starts at **15**. What are his next **3** numbers?

☐ ☐ ☐

5 Which numbers are missing from Ali's pattern below?

☐ **80** **90** **100** ☐

Name .....

Solve mixed one-step problems involving multiplication and division

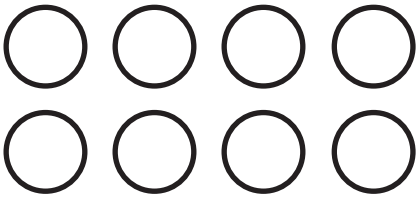
1 What comes next in Jing's number pattern below?

12 **14** **16** ☐ ☐

2 Usma eats **6** chocolate drops. Her dad eats double that number. How many does dad eat?

☐

3 Write the multiplication that this array shows.



☐ × ☐ = ☐

4 **Ten** sweets are shared between **2** children. How many sweets do they each have?

☐

5 Matt has **seven 2p** coins. How much money does he have altogether?

☐ **p**

Name .....

Solve mixed one-step problems involving multiplication and division

1. Class A has **10** boys. Class B has **double** that number of boys. How many boys are in Class B?

2. There are **six 5p** coins in Mum's purse. How much money does she have altogether?

p

3. Miss Williams puts **25** children into groups of **5**. How many groups does she make?

4. Ali writes a pattern of numbers below. What will the next **two** numbers be?

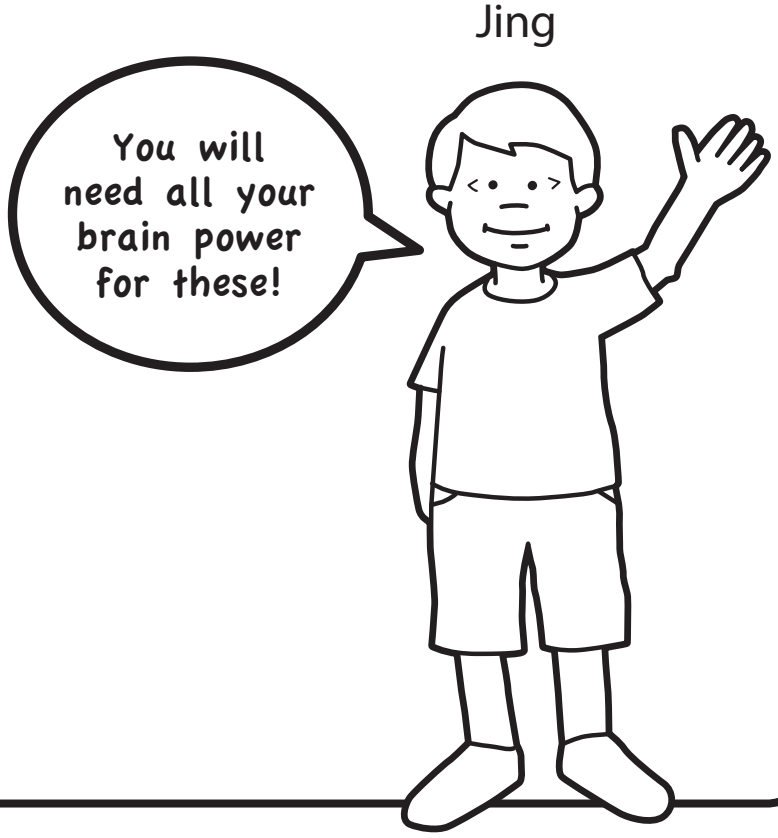
60 **50** **40**

5. Ali has **18** toy cars. Jing has **half** that number. How many toy cars does Jing have?

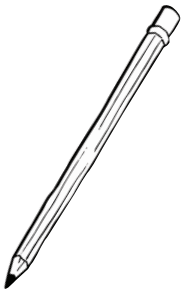
Name .....

MASTERING

Multiplication and division



1 Olivia buys some pencils.
Each pencil costs **10p**.
She spends **60p**.
How many pencils did Olivia buy?



2 There are **5** exercise books in each packet.
How many exercise books are there in **2** packets?

3 Usma has lots of **5p** and **10p** coins.
How can she make **25p**?
Can you find **three** ways to do this?
Write the number of coins needed in the boxes.

a ☐ **5p** ☐ **10p**

b ☐ **5p** ☐ **10p**

c ☐ **5p** ☐ **10p**

4 Matt gives the same number of stickers to Ali and Jing.
He gives out **14** stickers altogether.
How many stickers does he give to each friend?

Name .....

5 Matt was counting in **fives**.
He missed out a number.
Write the number that Matt missed out in the correct place.

5 10 15 20 30 35

6 At the zoo, lizards are kept in **4** tanks.
There are **5** lizards in each tank.
How many lizards are there altogether?

7 Fill in the missing gaps
Two are done for you

Double	**8**				
	4	**2**	**6**	**10**	**8**
Half	**2**				

8 In Year 1, there are **24** children.
Each child brings **2** pencils to school.
How many pencils do the children bring to school altogether?

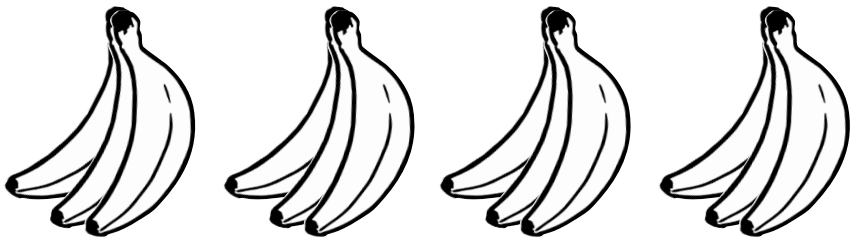
Name .....

9 Year 1 walk to the swimming pool in pairs.
There are **24** children in Year 1.
How many pairs are there?

10 When I doubled a number, the answer was **14**.
What was the number?

11 When I halved a number, the answer was **13**.
What was the number?

12 There are **three** bananas in each bunch.
How many bananas are there altogether?



13 Usma has saved some **5p** coins in a box.
Altogether she has **25p**.
How many **5p** coins does Usma have?

Name .....

14 Matt starts at **10** and counts in **tens**.
Will he say the number **31**?

Yes / No

Explain your answer.

.....

.....

15 Jing has lots of **2p**, **5p** and **10p** coins. He needs **22p**. How does Jing make **22p**? Can you make it **3** different ways?

a ☐ **2p** ☐ **5p** ☐ **10p**

b ☐ **2p** ☐ **5p** ☐ **10p**

c ☐ **2p** ☐ **5p** ☐ **10p**

16 If Rose drinks **five** bottles of milk in **one** week, how many bottles of milk will she drink in **two** weeks?

☐

Name .....

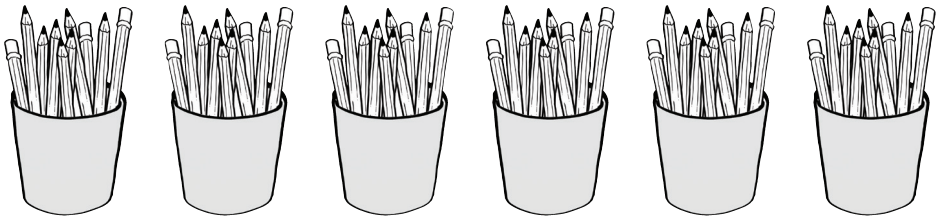
17 The numbers in the shaded squares make a sequence.
Continue the pattern by colouring 3 more squares.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

18 Olivia was counting in **twos** but she made a mistake.
Draw a circle around the number that was not correct.

2 4 6 7 8 10 12 14

19 Pencils are kept in pots in the classroom.
There are **10** pencils in each pot.



a How many pencils are there altogether?

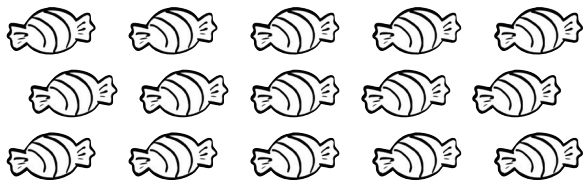
Jing has **40** pencils.

b How many pots does Jing need for his pencils?

20 Mrs Patel is giving out reading books to the children in her class.
There are **10** books to share between **5** children.
How many books will each child receive?

Name .....

21 **5** children share these sweets equally. How many sweets does each child get?



22 There are **5** chairs around each table in the classroom.
Rose counted **30** chairs.
How many tables are there?

23 Miss Walker gives each child in her class **two** pencils.
There are **22** children in Miss Walker's class.
How many pencils did she give out?

24 How many:

5p coins make 40p

10p coins make 70p

2p coins make 16p

Name .....

25 Usma put **three** bean bags in each hoop.
There were **5** hoops.
How many bean bags did Usma put into hoops?

☐

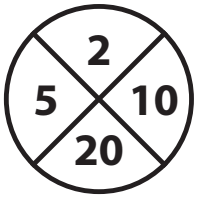
---

26 Ali is playing darts.
He has **two** darts.
How can he score exactly

a **7 points?** ☐ + ☐

b **12 points?** ☐ + ☐

c **15 points?** ☐ + ☐



d What is the highest score he can make with **two** darts?
(Each dart must go into a different section.)

☐ + ☐ = ☐

---

27 Olivia bought **3** pencils.
Each pencil cost **10p**.
Rose bought a pack of **three** pencils for **25p**.
How much less did Rose pay for the pack of **three** pencils than Olivia paid for **three** single pencils?

☐ **p**

Name .....

28 Rose bought a packet of crisps for **25p**.
She paid for it exactly using silver coins only.
What coins could she have used?

= 25p

29 Ali has to sort out the pencils in the classroom.
He needs to put **10** pencils in each pot.
There are **6** pots.
How many pencils does Ali have to sort out?

30 Ali has **20p**.
All the coins are **2p** coins.
How many **2p** coins does Ali have?

31 Matt also has **20p**.
All his coins are **5p** coins.
How many **5p** coins does Matt have?

32 Jing also has **20p**.
All his coins are **10p** coins.
How many **10p** coins does Jing have?

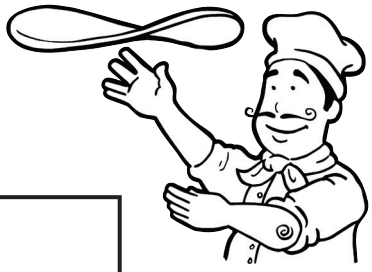
Name .....

NUMBER

Fractions

Find a half of an object, shape or quantity

1. Olivia buys a **whole** pizza. She eats **half**. How much does she have left?



2. **4** children are split into **2** teams. How many children are in each team?

3. Olivia says, "The opposite of **doubling** is **halving**."
Is she correct?

Yes / No

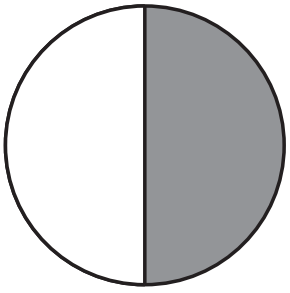
Explain your answer.

.....

.....

4. Ali has **10** conkers. He gives **half** of them to his sister. How many does Ali have left?

5. How much of this shape is shaded?



Name .....

Find a half of an object, shape or quantity

1. Jing has **4** biscuits. He eats **half** of them at lunchtime. How many has he eaten?

2. What is **half** of **8**?

3. It is Jing's birthday. He eats **half** of his birthday cake. What fraction of cake does he have left?

4. **Half** of a number is **3**. What is the number?

5. Rose thinks of a number and then **doubles** it. Her answer is **14**. What was her number?

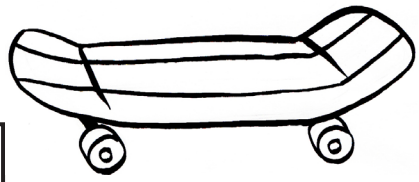
Name .....

Find a half or a quarter of an amount of money

1. Usma has **20p**. She spends **one quarter** on a chocolate biscuit. How much does she spend?

p

2. Rose has **£28**. She spends **half** of her money on a skateboard. How much does she have left?



£

3. Grandad has **£40**. He gives Usma **one quarter** and Jing **one quarter** of the money. How much money does Grandad have left?

£

4. A game was **£40**. There is a **quarter** off in a sale. How much is the game now?

£

5. Ali has **£16**. His sister has **one quarter** less than this. How much money does his sister have?

£

Name .....

Find a half or a quarter of an amount of money

1. Rose has **10p**. She spends **half** of her money on a lollipop. How much does she have left?

   ☐ **p**

2. Jing got **£16** for his birthday. He spent a **quarter** of his money on a book. How much did the book cost?

   £ ☐

3. A **£10** t-shirt is now **half** price. How much is the t-shirt now?

   £ ☐

4. Matt has **£20**. Olivia has **one quarter** of this amount. How much money does Olivia have?

   £ ☐

5. Rose has **40p**. She spends **one quarter** on an apple and another **quarter** on a drink. How much money does she spend altogether?

   ☐ **p**

Name .....

Find a half or a quarter of an object, shape or quantity

1. **One quarter** of **12** ducks are swimming on the pond. How many ducks is this?

2. **6** children are playing football. **Half** the children are boys. How many are boys?

3. Ali cut a circle into **four** equal pieces. He gave **three** of the pieces to his friend. What fraction of the circle did Ali still have?

4. Find **one quarter** of the number **16**.

5. Olivia thinks of a number and **doubles** it. Her answer is **18**. What was the number?

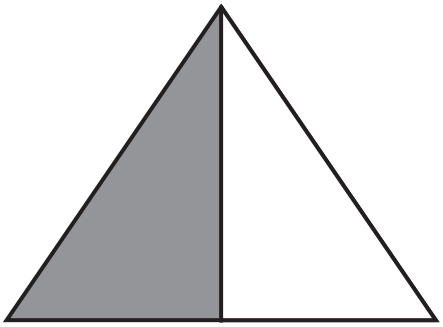
Name .....

Find a half or a quarter of an object, shape or quantity

1. Usma eats **one half** of her cake. What fraction does she have left?

2. Find a **quarter** of the number **8**.

3. What fraction of this shape is not shaded?



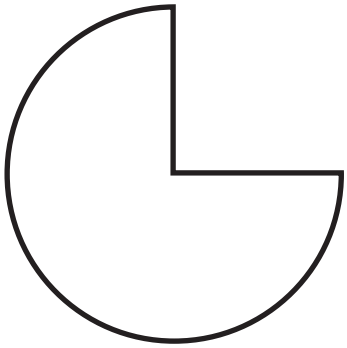
4. There are **12** eggs in a box. Ali uses a **quarter** of them to make breakfast. Then he accidentally drops the box and breaks **3** eggs. How many eggs are left?

Name .....

Find a quarter of an object, shape or quantity

1. The Raj family are having an apple pie. They have a **quarter** of the pie each and eat it all. How many people are in the Raj family?

2. What fraction of this **whole** shape is missing?



3. Usma says, "One quarter of **16** is **5**." Is she correct? **Yes / No**

   Explain your answer.

   .....

   .....

4. There are **20** stickers in a pack. Matt sticks **one quarter** of the stickers into his book. How many stickers did he use?

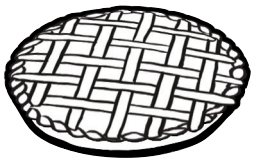
Name .....

Find a quarter of an object, shape or quantity

1 If you cut a square into **four** equal pieces, what fraction is each piece?

2 Rose eats **one quarter** of an apple pie. Circle the fraction that shows **one quarter**.

$\frac{1}{2}$ $\frac{2}{4}$ $\frac{1}{4}$ $\frac{3}{4}$



3 Find **one quarter** of the number **8**.

4 Matt eats a **quarter** of his sweets. If he started with **16** sweets, how many does he have left?

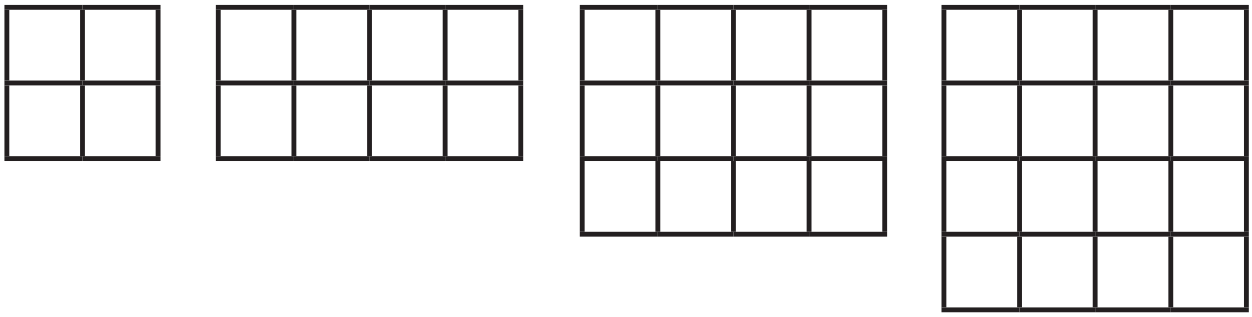
5 **40** children are in the classroom. **One quarter** of the children are painting. How many children are painting?

Name .....

MASTERING

Fractions

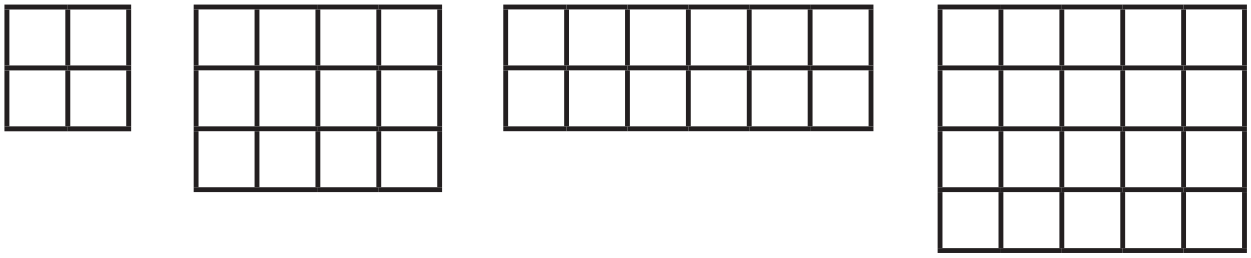
1 How many small squares make $\frac{1}{4}$ of each shape?
Shade them in to show your answer.



2 Ali has **10p** and **2p**.
He uses $\frac{1}{4}$ of his money to buy a sweet.
How much does he have left?

☐ **p**

3 How many small squares make $\frac{1}{4}$ of each shape?
Shade them in to show your answer.



4 What comes next?

10 **$9\frac{1}{2}$** **9** ☐

5 Count up in **halves**.

6 **$6\frac{1}{2}$** ☐ ☐ **8**

Name .....

6 Usma has these coins.

She uses **half** of her money to buy a lollipop.

How much has she spent?

_____ **p**

7 Complete this halving wall.

a

20			
10			

Now complete these walls.

b

40			

c

4			

d

8			

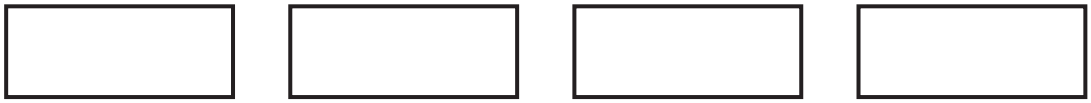
e

16			

Name .....

8 Olivia invites some of her friends to her birthday party.
Half of the children like cola and **half** of the children like lemonade.
How many children might Olivia have invited if she sent invitations to between **11** and **19** children?

Can you find **4** answers?



9 Ali and Olivia go on a picnic.
They share the food equally.
Altogether, they have **two** ham sandwiches, **one** packet of crisps, **three** plums and **four** chocolate bars.

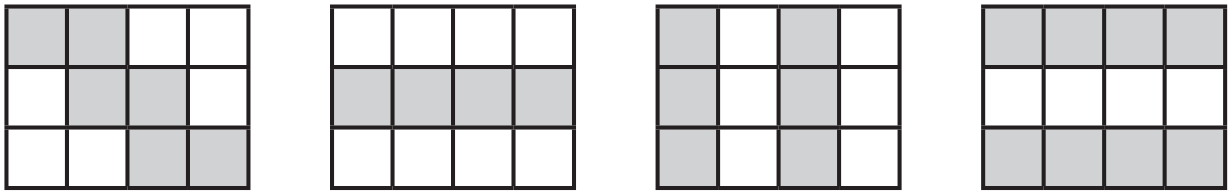
How much of each type of food do they each receive?

Complete the table. It has been started for you.

	Ali	**Olivia**
ham sandwiches	**1**	**1**
crisps		
plums		
chocolate bars		

Name .....

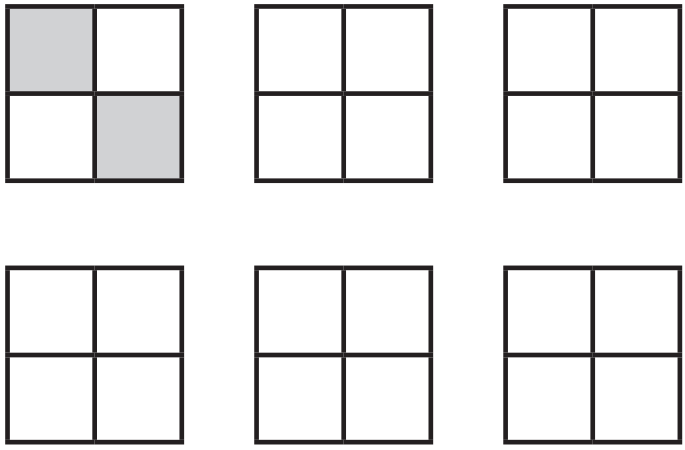
10 Put a circle around the shapes which have exactly **one half** shaded.



11 Jing has **12** pencils.
Half of them are blue, a **quarter** of them are red, and the rest are green.
How many of each colour does he have?

blue ☐ **red** ☐ **green** ☐

12 Shade each shape to show $\frac{1}{2}$ in different ways.
One has been done for you.



Name .....

13 There are **20** children in a class.
They need to get into **four** teams for a quiz.
Rose says that each team needs **six** children in it.
Is she correct?

Yes / No

Explain your answer.

.....

.....

14 Usma has counted back in **halves**.
She has missed out **one** number.
Add the number she has missed.

4 **$3\frac{1}{2}$** ☐ **$2\frac{1}{2}$** **2**

15 **Four** children go bowling.
Altogether, they have **12** goes.

a How many goes does each child have if they all have the same number?

☐

b After bowling, the children share **20** chicken nuggets.
How many chicken nuggets do they each get?

☐

Name .....

16 Rose says that she can find $\frac{1}{4}$ of **8**.

a Is she correct? **Yes / No**

Explain your answer.
You can draw a diagram or use counters if this helps.

.....

.....

b Write **4** different numbers that Rose could find $\frac{1}{4}$ of.

17 Jing has an odd number of pencils.
He says he can't share them equally between **two** friends.

Is he correct? **Yes / No**

Explain your answer.

.....

.....

.....

Name .....

HeadStart primary

PROBLEM SOLVING AND REASONING

YEAR 1

Part 2

ANSWERS

MASTERING - Addition and subtraction

Page 1: 1) 22p 2) exactly 15p; apple and banana, lollipop and biscuit. Change needed; sweet and lollipop, banana and biscuit, lollipop and banana, sweet and apple, sweet and biscuit, sweet and banana

Page 2: 3) appropriate answers 4) there are 12 appropriate responses

Page 3: 5) 1 + 11, 2 + 10, 3 + 9, 4 + 8, 5 + 7, 6 + 6 6) 10p

Page 4: 7) Rose. The answer needs reference made to 0 having no value.
8) 5 9) 27 10) a) 12 b) 5 + 7 = 12

Page 5: 11) a) 12 b) 3 c) 9 d) 6 12) a) 9 b) 17 – 8 = 9

Page 6: 13) 4, 7 14) a) 16 b) 12 + 4 = 16 15) 1

Page 7: 16) 20 – 13 = 7, 18 – 13 = 5, 20 – 6 = 14 17) 7 + 5 = 12, 12 – 7 = 5 or 12 – 5 = 7
18) 5 + 3 = 8, 3 + 5 = 8, 5 = 3, 8 – 3 = 5

Page 8: 19) a) correct b) incorrect; 9 c) incorrect; 19 d) correct 20) 14, 2, 1

Page 9: 21) the answer must be one more because 3 is one more than 2 22) 12 23) 16, 2, 14

Page 10: 24) 0 + 14, 1 + 13, 2 + 12, 3 + 11, 4 + 10, 5 + 9, 7 + 7 appropriate answer
25) appropriate run scoring to total 5

Page 11: 26) any from 2 + 2, 3 + 1, 5 – 1, 6 – 2, 7 – 3, 8 – 4, 9 – 5, 10 – 6, 11 – 7
27) any appropriate combinations

Page 12: 28) lollipop and apple, biscuit and orange, cake and banana, sweet and crisps, drink and saucer 29) lollipop + biscuit + banana, cake + biscuit + saucer, apple + sweet + saucer 30) biscuit, banana, sweet, saucer

Page 13: 31) 8 32) appropriate combinations of 10, 4, 2 or 8, 6, 2 33) 37, 22, 49, 55

Page 14: 34) 5 minutes 35) appropriate answers 36) 16 37) 8 38) 6

Page 15: 39) 7 metres 40) a) 9 b) 6 41) 1 + 6, 2 + 5, 3 + 4, 4 + 3, 5 + 2

Page 16: 42) 20 – 6 = 14 43) 15 + 0, 1 + 14, 2 + 13, 3 + 12, 4 + 11, 5 + 10, 6 + 9, 7 + 8 44) 8 or 9

Year 1: NUMBER - Multiplication and division

Page 17: 1) 2 2) yes; appropriate explanation 3) 4 4) 10 5) no; appropriate explanation

Page 18: 1) 4 2) 8 3) 12 4) 14 5) 26

Page 19: 1) 2 2) 3 3) 8 4) £5 5) 8

Page 20: 1) 4 x 2 = 8 circled 2) 3 x 2 = 6, 2 x 3 = 6 3) no; appropriate explanation

Page 21: 1) 3 x 2 = 6 circled 2) appropriate drawing 3) 12 4) 2 x 10 = 20 or 10 x 2 = 20

Page 22: 1) 3 2) 2 3) 5 4) 2 5) 6

Page 23: 1) 3 2) 4 3) 5 4) 3 5) appropriate drawings

Page 24: 1) 5 2) £10 3) 7 4) 4 5) 12

Page 25: 1) 5 2) £5 3) 7 4) £2 5) 6

Page 26: 1) 10 2) 16 3) 27, 32 4) 23 5) 60, 50

Page 27: 1) 30, 40 2) 12, 14, 16 3) 34, 38 4) 20, 25, 30 5) 70, 110

Page 28: 1) 18, 20 2) 12 3) 4 x 2 = 8 or 2 x 4 = 8 4) 5 5) 14p

Page 29: 1) 20 2) 30p 3) 5 4) 30, 20 5) 9

MASTERING - Multiplication and division

Page 30: 1) 6 2) 10 3) a) 3 x 5p + 1 x 10p b) 1 x 5p + 2 x 10p c) 5 x 5p 4) 7

Page 31: 5) 25 6) 20 7) double: 4, 12, 20, 16, half: 1, 3, 5, 4 8) 48

Page 32: 9) 12 10) 7 11) 26 12) 12 13) 5

Page 33: 14) no, appropriate explanation
15) any from;10p + 10p + 2p, 5p + 5p + 10p + 2p, 5p + 5p + 5p + 5p + 2p, 2p + 2p + 2p + 2p + 2p + 2p 16) 10

Page 34: 17) shade 15, 20, 25 18) 7 19) a) 60 b) 4 20) 2

Page 35: 21) 3 22) 6 23) 44 24) 8, 7, 8

Page 36: 25) 15 26) a) 5 and 2 b) 10 and 2 c) 10 and 5 d) 10 + 20 = 30 27) 5p

Page 37: 28) 10p +10p + 5p, 20p + 5p, 5p + 5p + 5p + 5p + 5p 29) 60 30) 10 31) 4 32) 2

Year 1: NUMBER - Fractions

Page 38: 1) half 2) 2 3) yes; appropriate explanation 4) 5 5) half

Page 39: 1) 2 2) 4 3) half 4) 6 5) 7

Page 40: 1) 5p 2) £14 3) £20 4) £30 5) £12

Page 41: 1) 5p 2) £4 3) £5 4) £5 5) 20p

Page 42: 1) 3 2) 3 3) quarter 4) 4 5) 9

Page 43: 1) half 2) 2 3) half 4) 6

Page 44: 1) 4 2) quarter 3) no; appropriate explanation 4) 5

Page 45: 1) quarter 2) quarter circled 3) 2 4) 12 5) 10

MASTERING - Fractions

Page 46: 1) shaded: 1, 2, 3, 4 squares 2) 9p 3) shaded 1, 3, 3, 5 squares 4) $8\frac{1}{2}$ 5) 7, $7\frac{1}{2}$

Page 47: 6) 4p 7) a) 10, 5, 5, 5, 5 b) 20, 20, 10, 10, 10, 10 c) 2, 2, 1, 1, 1, 1 d) 4, 4, 2, 2, 2, 2 e) 8, 8, 4, 4, 4, 4

Page 48: 8) 12, 14, 16, 18 9) crisps $\frac{1}{2}$ each, plums $1\frac{1}{2}$ each, chocolate bars 2 each

Page 49: 10) first and third 11) 6 blue, 3 red, 3 green 12) any appropriate answers

Page 50: 13) no; because 4 x 6 = 24 14) 3 15) a) 3 b) 5

Page 51: 16) a) yes; appropriate diagram b) any numbers that can be divided by 4
17) yes; appropriate explanation