

# I SEE REASONING YEAR 3

Tasks to inspire mathematical thinking

**SAMPLE**

$$13 - 8 =$$

$$23 - 18 =$$

$$25 - 20 =$$

What do you notice?

Contexts:

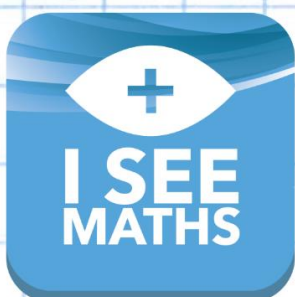
A finger is part of...  
Part of a finger is...  
England is part of...

Which Answer?

$$16 + 4 + 4 + 4$$

How many 4s?

(a) 3    (b) 7



BY GARETH METCALFE

Available for digital download

## Read the Pictures

dice, **3** dots per dice  
 dots in total

Some dice are hidden.

dice, **4** dots per dice  
**20** dots in total

dice, **5** dots per dice  
**30** dots in total

dice, **3** dots per dice  
**21** dots in total

## Read the Pictures

**3** rows      **6** columns  
 dots in total

Some dots are hidden.

**2** rows       columns  
**18** dots in total

rows      **8** columns  
**24** dots in total

**4** rows       columns  
**28** dots in total

## Explore

With **20 matchsticks** I can make...



triangles,  left over.       squares,  left over.

pentagons,  left over.       hexagons,  left over.

## Explore

There are **3 squares** and **2 matchsticks** are left over.



**Rearrange the same number of matchsticks.**

There are  triangles and  matchsticks are left over.

There are **2**  and **4** matchsticks are left over.

## Explore

There are **6 triangles** and **0 matchsticks** are left over.

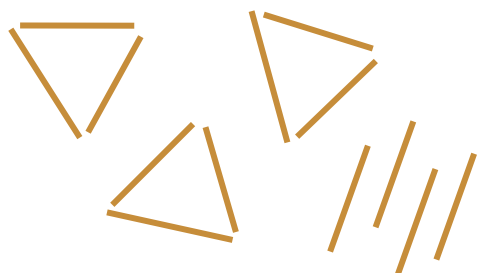


**Rearrange the same number of matchsticks.**

There are  squares and  matchsticks are left over.

There are **3**  and **0** matchsticks are left over.

## Explain the Mistake



With 13 matchsticks, 3 triangles can be made and 4 matchsticks are left over

## Read the Pictures

For each picture, **how many matchsticks in total?**

There are **5 triangles** and **2 matchsticks are left over**.  
Some of the triangles are hidden.



There are **6 squares** and **3 matchsticks are left over**.  
Some of the squares are hidden.



## Explain

**Question A:** How many **triangles** can be made with **12 matchsticks**?



**Question B:** How many **hexagons** can be made with **24 matchsticks**?



I noticed that...

This is because...

## Different Ways

Use **24 matchsticks**.

Make more than one of the **same shape**.

There must be **no matchsticks left over**.

*Find different possible ways.*



## Different Ways

Use **17 matchsticks**.

Make more than one of the **same shape**.

There must be **2 matchsticks left over**.

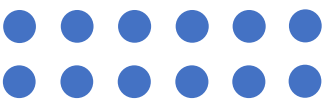
*Find different possible ways.*



## How Many Ways?

**Make an array using 20 counters.**

*Write how many **rows** and **columns** for each array.*

<b>Example array:</b>	<b>12</b> counters
	<b>2</b> rows
	<b>6</b> columns

**Level 1:** *I can find an answer*

**Level 2:** *I can find different answers*

**Level 3:** *I know how many answers there are*


## Extend

**How many arrays can be made with:**

(a) 16 counters

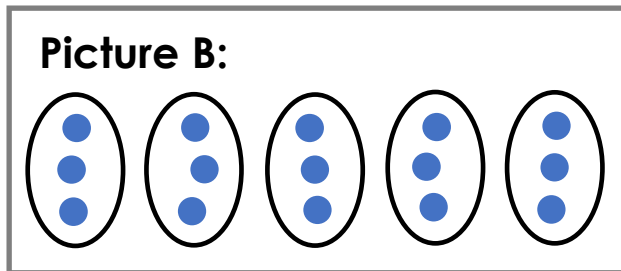
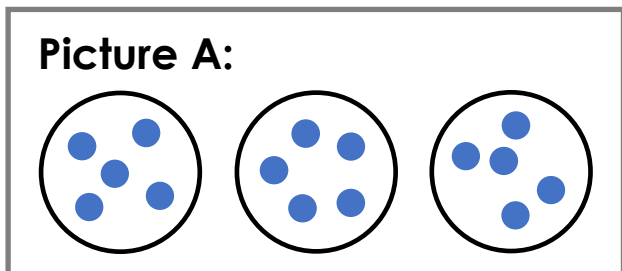
(b) 17 counters

(c) 21 counters

<b>Example arrays with 8 counters:</b>

<i>Two possible arrays.</i>

# Read the Pictures

Which picture shows  $15 \div 5$ ?



## Draw

Draw a picture to show the answer to each question:

**(a)** 14 grapes are shared equally by 2 people.  
How many grapes each?

**(b)** There are 14 socks.  
How many pairs of socks can be made?

What's the same?    What's different?

## Draw

Draw a picture to show the answer to each question:

**(a)** 20 people are going to the match. 4 people per car.  
How many cars are needed?

**(b)** 20 stickers are shared equally by 4 children.  
How many stickers each?

What's the same?    What's different?

## Explain

Joy and Zara calculate  $18 \div 6$ . Here are their methods:

**Joy:**

*I shared 18 into 6 groups.  
There are **3** in each group.*

**Zara:**

*I had groups of 6. In 18,  
there are **3** groups of 6.*

**I agree with...**

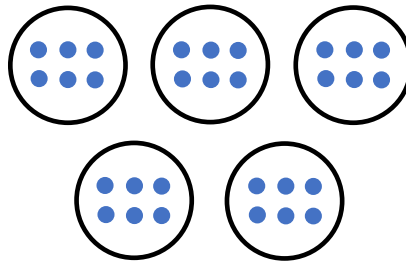
**For this question, the best method is...**

## Read the Picture

Tom and Kam made division stories for this picture:

**Tom's story:**

30 eggs are put  
in boxes of 6.  
**How many  
boxes are  
needed?**



**Kam's story:**

30 sweets are  
shared between  
5 children. **How  
many sweets  
each?**

**Compare the stories. What's the same? Different?  
Which of the stories are represented by the picture?**

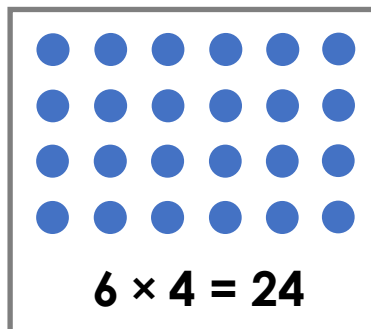
## True or False?

✓ or ✗

$6 \div 4 = 24$

$24 \div 4 = 6$

$6 \div 24 = 4$



$24 \div 6 = 4$

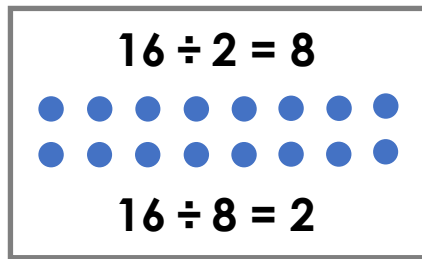
$24 = 6 \div 4$

$4 = 24 \div 6$

## I know... so...

$14 \div 2 = \square$

$18 \div 2 = \square$



$16 \div 4 = \square$

$24 \div 8 = \square$

## I know... so...

$8 \times 4 = 32$

$32 \div 8 = \square$

$5 \times 7 = 35$

$35 \div 7 = \square$

$20 \div 2 = 10$

$20 \div 4 = \square$

$24 \div 8 = 3$

$24 \div 4 = \square$

$16 \div 2 = 8$

$18 \div 2 = \square$

$12 \div 3 = 4$

$15 \div 3 = \square$

$24 \div 3 = 8$

$21 \div 3 = \square$

$30 \div 5 = 6$

$40 \div 5 = \square$

## I know... so...

$27 \div 3 = 9$

$27 \div 9 = \square$

$27 \div 3 = 9$

$24 \div 3 = \square$

$40 \div 5 = 8$

$45 \div 5 = \square$

$40 \div 5 = 8$

$35 \div 5 = \square$

$24 \div 4 = 6$

$\square \div 4 = 5$

$24 \div 4 = 6$

$\square \div 4 = 7$

$15 \div 3 = 5$

$21 \div 3 = \square$

$15 \div 3 = 5$

$30 \div 6 = \square$

## Small Difference Questions

$20 \div 5 = \square$

$30 \div 5 = \square$

$30 \div 6 = \square$

$30 \div 3 = \square$

...is double...

$16 \div 8 = \square$

$16 \div 4 = \square$

$20 \div 4 = \square$

$20 \div 5 = \square$

...is the same as...

$24 \div 2 = \square$

$24 \div 4 = \square$

$24 \div 8 = \square$

$12 \div 4 = \square$

... is 4 more than...



## Small Difference Questions

$24 \div 4 = \square$

$16 \div 8 = \square$

$18 \div 9 = \square$

$28 \div 4 = \square$

$32 \div 8 = \square$

$18 \div 2 = \square$

$28 \div 7 = \square$

$40 \div 8 = \square$

$36 \div 4 = \square$

$35 \div 7 = \square$

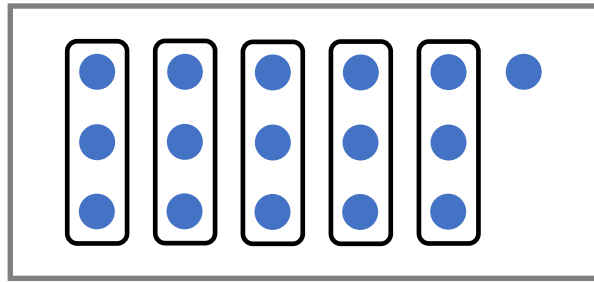
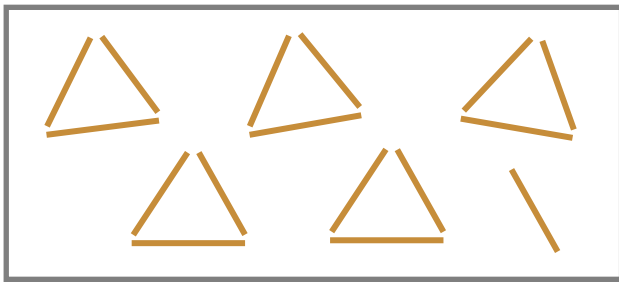
$20 \div 4 = \square$

$32 \div 4 = \square$

**Extend:** add another question to each sequence.

## Read the Pictures

Both pictures show the **number of 3s in 16**:

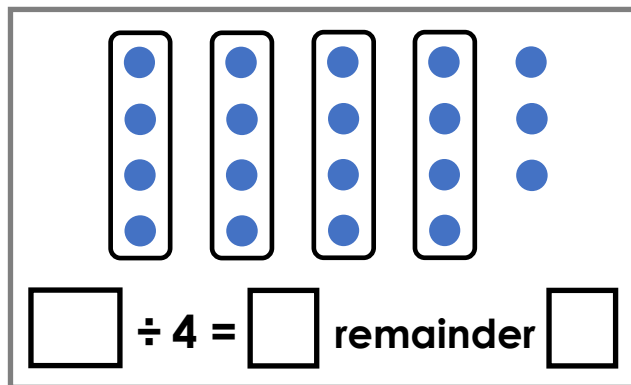
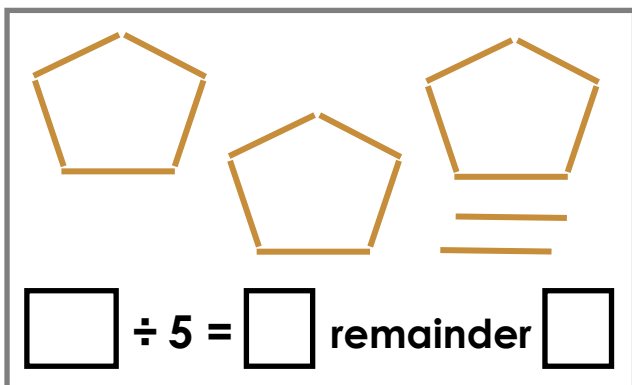


$16 \div 3 = \square \text{ remainder } \square$

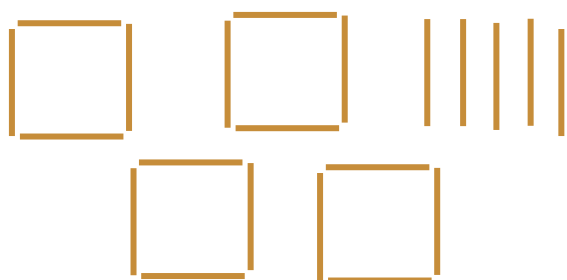
Draw pictures to show the **number of 4s in 14**.

## Read the Pictures

For each picture, **complete the number sentences**:



## Explain the Mistake



This shows that  
 $21 \div 4 = 4$  remainder  $5$

## Small Difference Questions

$$15 \div 5 = \square$$

$$20 \div 5 = \square$$

$$23 \div 5 = \square \text{ remainder } \square$$

$$28 \div 5 = \square \text{ remainder } \square$$

$$\square \div 5 = 6 \text{ remainder } 4$$

$$12 \div 4 = \square$$

$$20 \div 4 = \square$$

$$22 \div 4 = \square \text{ remainder } \square$$

$$25 \div 4 = \square \text{ remainder } \square$$

$$\square \div 4 = 10 \text{ remainder } 1$$

**Extend:** add another two question to each sequence.

## Small Difference Questions

$$30 \div 10 = \square$$

$$30 \div 5 = \square$$

$$34 \div 5 = \square \text{ remainder } \square$$

$$34 \div 4 = \square \text{ remainder } \square$$

$$\square \div 4 = 6 \text{ remainder } 1$$

$$20 \div 4 = \square$$

$$28 \div 4 = \square$$

$$28 \div 8 = \square \text{ remainder } \square$$

$$33 \div 8 = \square \text{ remainder } \square$$

$$\square \div 4 = 8 \text{ remainder } 3$$

**Extend:** add another two question to each sequence.

## Explain

Which numbers **leave a remainder** when...

**...divided by 5?**

14    20    35    32    100

**...divided by 4?**

14    20    35    32    100

When  $\div 5$ , I know... does not leave a remainder because...

When  $\div 4$ , odd numbers...

When  $\div 4$ , even numbers...

## Different Ways

Answer each question in **3 different ways**:

$$14 \div \square = \square \text{ remainder } 2 \qquad 14 \div \square = \square \text{ remainder } 2$$

$$14 \div \square = \square \text{ remainder } 2$$

$$31 \div \square = \square \text{ remainder } 1 \qquad 31 \div \square = \square \text{ remainder } 1$$

$$31 \div \square = \square \text{ remainder } 1$$

**Extend:** Make your own question that has 3 answers.

## Extend

$$20 \div 8 = 2 \text{ remainder } \square$$

$$23 \div 4 = 5 \text{ remainder } \square$$

$$27 \div 4 = \square \text{ remainder } 3$$

$$15 \div 8 = \square \text{ remainder } 7$$

$$20 \div \square = 6 \text{ remainder } 2$$

$$19 \div \square = 9 \text{ remainder } 1$$

$$\square \div 5 = 7 \text{ remainder } 1$$

$$\square \div 8 = 3 \text{ remainder } 2$$

## Explain

$$\square \div 4 = \square \text{ remainder } \square$$

'The largest number the remainder can be is...  
This is because...'

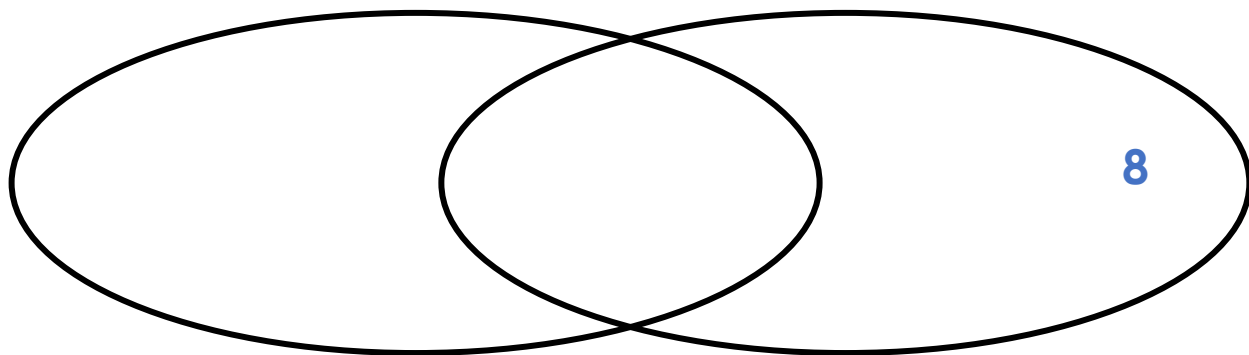
## Explore

Put the numbers in the correct part of the Venn diagram:

**16   20   14   24   18**

Divides by **3**, no remainder

Divides by **4**, no remainder



**Extend:** Put another number in each section.

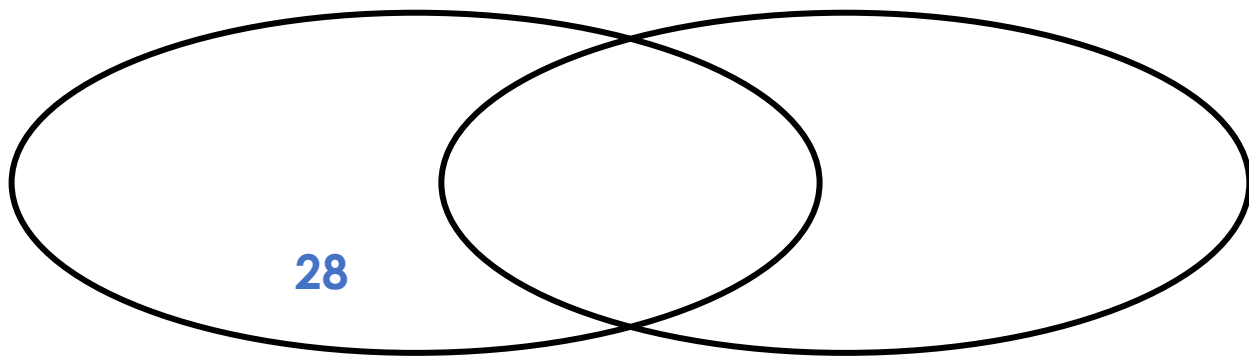
## Explore

Put the numbers in the correct part of the Venn diagram:

**20   24   34   50   100**

Divides by **4**, no remainder

Divides by **5**, no remainder



**Extend:** Put another number in each section.

## Explain

Circle the questions with a **2-digit quotient**:

$64 \div 8 =$

$60 \div 5 =$

$26 \div 2 =$

$36 \div 3 =$

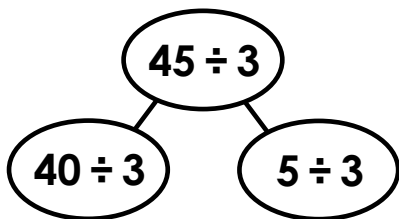
$36 \div 4 =$

Explain how you know.

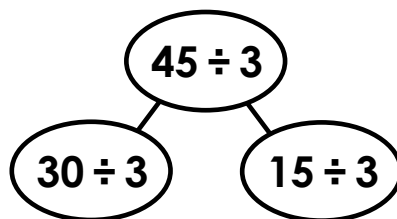
## Which Method?

To calculate  $45 \div 3$ , how can 45 be partitioned?

Split 45 into 40 and 5



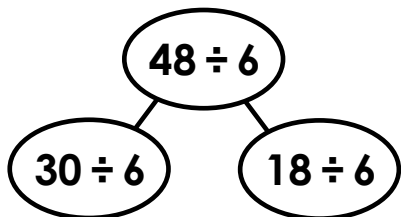
Break 45 into 30 and 15



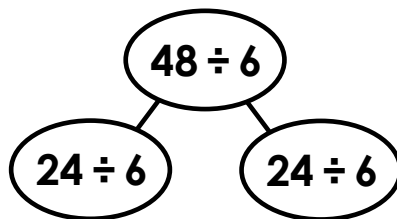
## Agree or Disagree?

To calculate  $48 \div 6$ :

Split 48 into 30 and 18



Break 48 into 24 and 24



## I know... so...

$40 \div 4 = 10$

$30 \div 3 = 10$

$50 \div 5 = \square$

$8 \div 4 = 2$

$18 \div 3 = \square$

$15 \div 5 = \square$

$48 \div 4 = \square$

$48 \div 3 = \square$

$65 \div 5 = \square$

# Part-Complete Examples

$$\begin{array}{l}
 39 \div 3 \\
 \swarrow \quad \searrow \\
 30 \div 3 = \square \quad 9 \div 3 = \square \\
 39 \div 3 = \square
 \end{array}$$

$$\begin{array}{l}
 70 \div 5 \\
 \swarrow \quad \searrow \\
 50 \div 5 = \square \quad 20 \div 5 = \square \\
 70 \div 5 = \square
 \end{array}$$

$$\begin{array}{l}
 52 \div 4 \\
 \swarrow \quad \searrow \\
 40 \div 4 = \square \quad 12 \div 4 = \square \\
 52 \div 4 = \square
 \end{array}$$

$$\begin{array}{l}
 54 \div 3 \\
 \swarrow \quad \searrow \\
 30 \div 3 = \square \quad 24 \div 3 = \square \\
 54 \div 3 = \square
 \end{array}$$

# Explain the Mistakes

**Mistake A:**

$$\begin{array}{l}
 56 \div 4 \\
 \swarrow \quad \searrow \\
 50 \div 4 = 12 \quad 6 \div 4 = 2 \\
 \underline{56 \div 4 = 14}
 \end{array}$$

**Mistake B:**

$$\begin{array}{l}
 75 \div 5 \\
 \swarrow \quad \searrow \\
 50 \div 5 = 10 \quad 25 \div 5 = 3 \\
 \underline{75 \div 5 = 13}
 \end{array}$$

# Different Ways

$$\begin{array}{l}
 60 \div 5 \\
 \swarrow \quad \searrow \\
 \square \div 5 = \square \quad 10 \div 5 = 2 \\
 60 \div 5 = \square
 \end{array}$$

$$\begin{array}{l}
 60 \div 5 \\
 \swarrow \quad \searrow \\
 \square \div 5 = \square \quad 20 \div 5 = 4 \\
 60 \div 5 = \square
 \end{array}$$

$$\begin{array}{l}
 64 \div 4 \\
 \swarrow \quad \searrow \\
 \square \div 4 = \square \quad 24 \div 4 = 6 \\
 64 \div 4 = \square
 \end{array}$$

$$\begin{array}{l}
 64 \div 4 \\
 \swarrow \quad \searrow \\
 \square \div 4 = \square \quad 32 \div 4 = 8 \\
 64 \div 4 = \square
 \end{array}$$

## Rank by Difficulty

$38 \div 4 =$

$27 \div 9 =$

$40 \div 3 =$

$80 \div 5 =$

$100 \div 4 =$

The answer to... has a remainder

I know the answer to... is a single-digit number because...

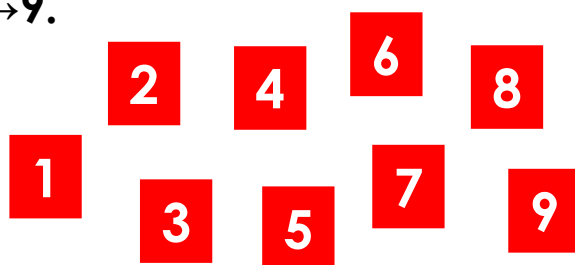
To find the answer to... I partitioned... into...

## How Many Ways?

Complete using the digits 0→9.

Position the digit 0 as shown:

$\square \mathbf{0} \div \square = \square$



**Level 1:** I can find an answer

**Level 2:** I can find different answers

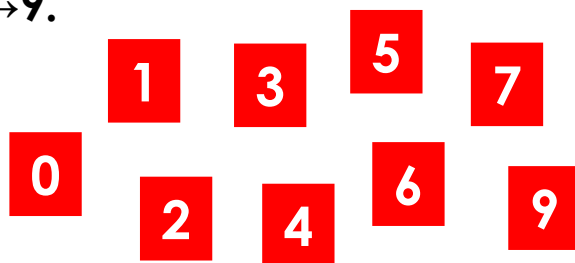
**Level 3:** I know how many answers there are

## How Many Ways?

Complete using the digits 0→9.

Position the digit 8 as shown:

$\square \mathbf{8} \div \square = \square$



**Level 1:** I can find an answer

**Level 2:** I can find different answers

**Level 3:** I know how many answers there are

**Extend:** Make a 'How Many Ways?' division question.

## Contexts

**Which questions are answered by calculating  $15 \div 5$ ?**

- (a) There are 15 children in the hall. There are 5 children at each table. **How many tables are there in the hall?**
- (b) 15 people have 5 grapes each. **How many grapes in total?**
- (c) 5 children share 15 pencils. **How many pencils each?**
- (d) Of the 15 children that go to running club, there are 5 girls. **How many boys go to running club?**

## Explain the Mistakes

**Tom filled the gaps to give possible answers to the questions.**  
For each example, explain the mistake.

7	sweets per bag
5	bags
45	sweets in total

5	cats
3	dogs
15	pets

8	People camping
4	People per tent
32	Tents needed

## Read the Pictures

Bar Model	Story										
<table border="1"> <tr> <td colspan="3">?</td> </tr> <tr> <td>6</td> <td>6</td> <td>6</td> </tr> </table>	?			6	6	6					
?											
6	6	6									
	<p>There are 16 children at drama club. There are 9 girls.</p> <p><b>How many boys at drama club?</b></p>										
<table border="1"> <tr> <td colspan="5">30</td> </tr> <tr> <td>?</td> <td>?</td> <td>?</td> <td>?</td> <td>?</td> </tr> </table>	30					?	?	?	?	?	
30											
?	?	?	?	?							



## Which Answer?

Which number sentence represents each question?

Zara has 3 times more money than Emma.  
Emma has £12. **How much money does Zara have?**

$$3 \times \square = \text{£}12$$

$$3 \times \text{£}12 = \square$$

20 children going to the concert. 4 children in each car. **How many cars are needed?**

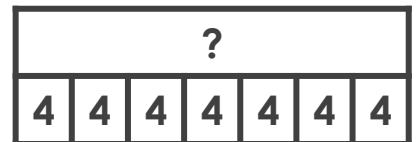
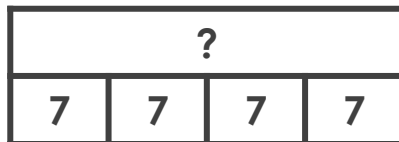
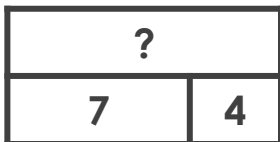
$$4 \times \square = 20$$

$$20 \div 4 = \square$$

## Which Picture?

When it's not a leap year, there are 4 weeks in February.

**When it's not a leap year, how many days in February?**



**Which bar model represents the questions correctly?**

*Explain the mistakes.*

## Small Difference Questions

(a) There are 6 girls and 3 boys at the park.

**How many children at the park?**

(b) There are 6 girls at the shop. There are 3 times as many boys as girls at the shop. **How many boys at the shop?**

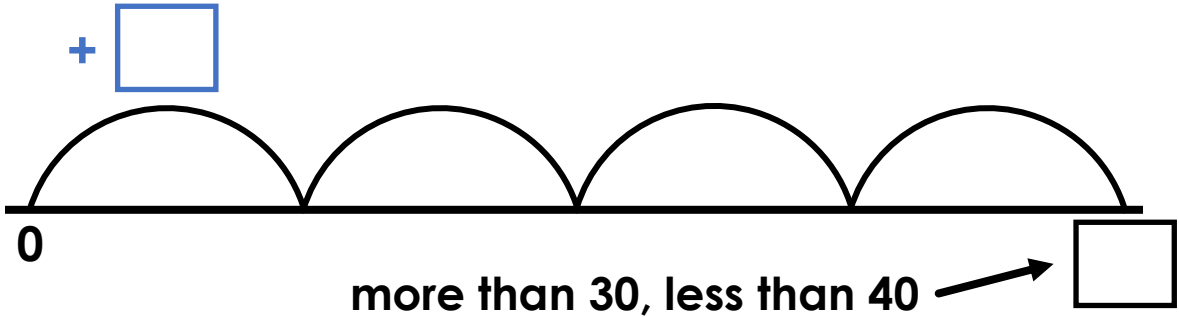
(c) There are 3 boys at the party. There are 6 times as many girls as boys at the party. **How many girls at the party?**

*Compare the questions. What's the same? What's different?*

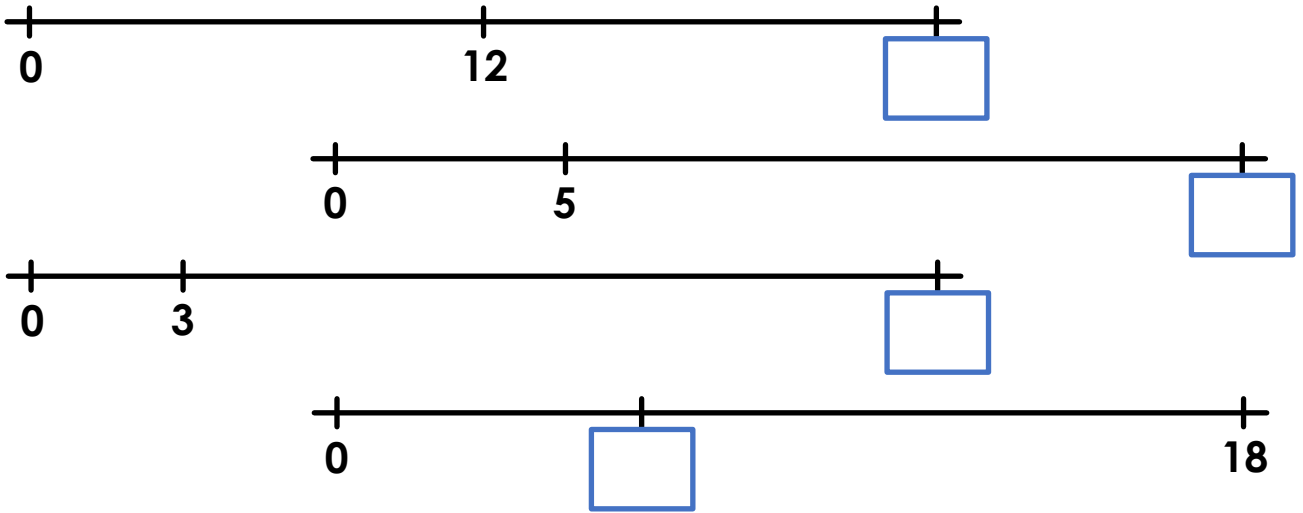
# Different Ways

Each jump on the number line is the same.

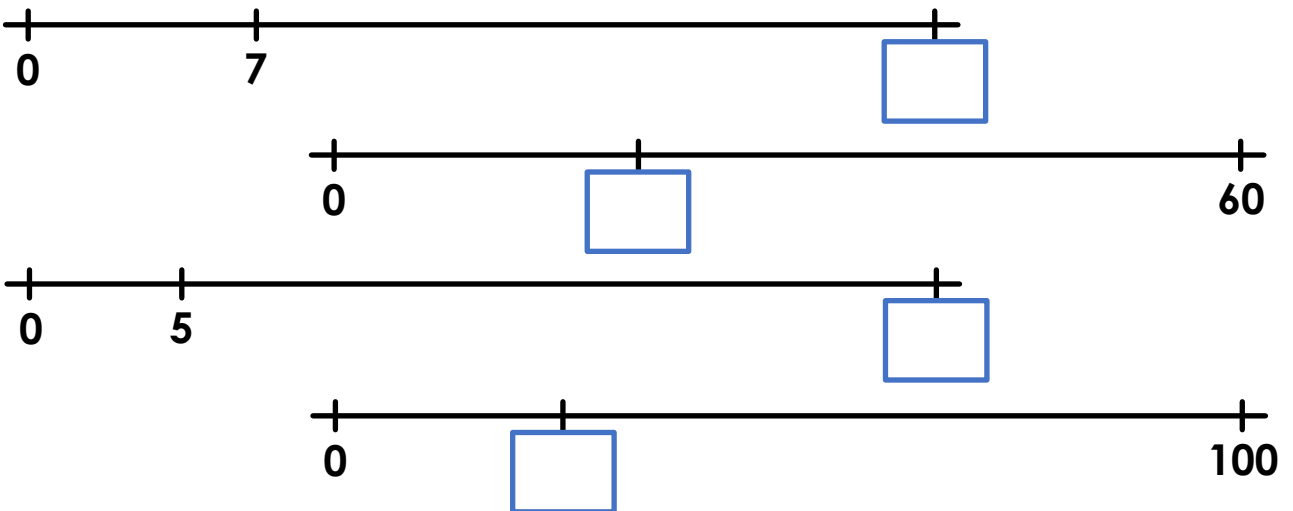
Which numbers could be in the blue box?



## Estimate

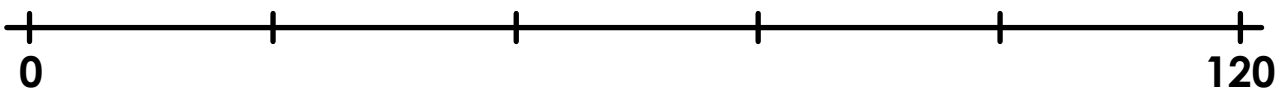
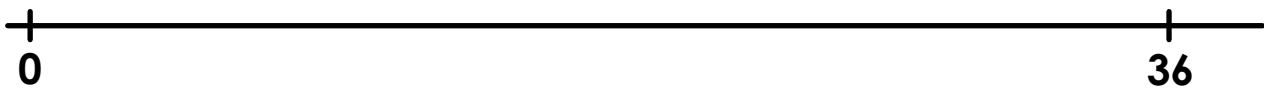
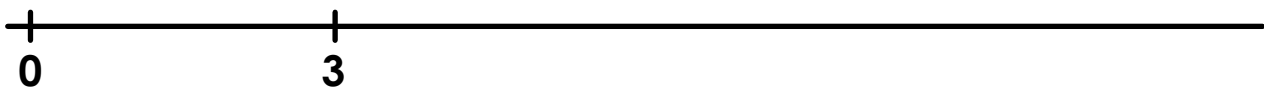
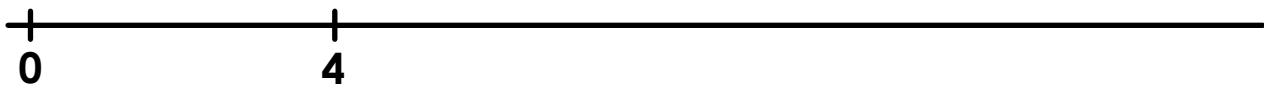


## Estimate



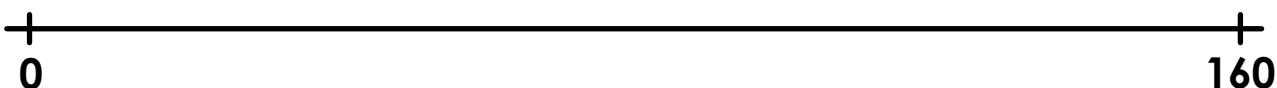
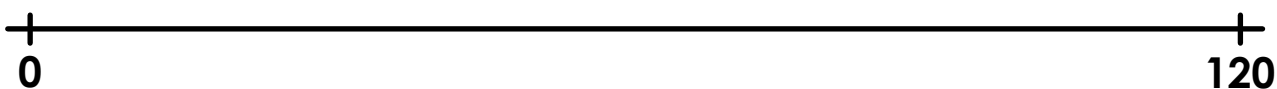
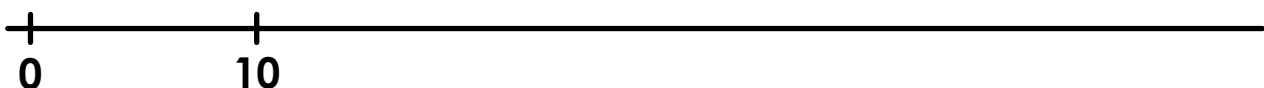
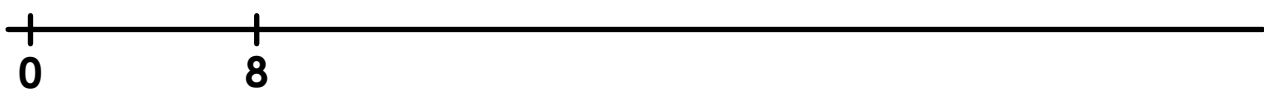
## Estimate

Position **12** on each number line:



## Estimate

Position **40** on each number line:



## Context

Tim's Dad is called Paul.

Paul is four times as old as Tim.

Tim is older than 9 years old.

Paul is younger than 45 years old.

**How old could Paul be?**

## Read the Pictures

For each picture, **write different multiplication and division number sentences:**

$12 \div 6 = \square$

1

1

1

1

1

1

1

1

1

1

1

1

10

10

10

10

10

10

10

10

10

10

10

10

$\square = 60 \times 2$

## Agree or Disagree?

This means  $9 \times 3 = 27$

$3 \times 9 = 27$

This means  $27 \div 3 = 9$

This means  $3 \times 27 = 9$

This means  $27 = 9 \times 3$

This means  $8 \div 32 = 4$

$32 \div 8 = 4$

This means  $32 = 8 \div 4$

This means  $32 \div 4 = 8$

## Which Answer?

The answer is 4,  
there are 4 lots  
of 20 in 80

$80 \div 20 = \square$

The answer is 40,  
it's 10 times  
bigger than  $8 \div 2$

## Odd One Out

For each set of 3 questions, **which number sentence is the odd one out?**

$2 \times \square = 10$

$10 \div \square = 2$

$\square \div 2 = 10$

$\square \times 3 = 12$

$\square = 12 \times 3$

$\square \div 3 = 12$

**Extend:** design your own set of 3 Odd One Out questions.

## Small Difference Questions

$8 \times 2 = \square$

$10 \div 5 = \square$

$20 \div 4 = \square$

$8 = 2 \times \square$

$10 \div \square = 5$

$20 \times 4 = \square$

$8 \div 2 = \square$

$10 \times 5 = \square$

$\square = 20 \times 4$

$\square = 8 \div 2$

$\square \div 5 = 10$

$\square \div 4 = 20$

$\square \div 8 = 2$

$5 = 10 \div \square$

$20 = 4 \times \square$

**Extend:** design your own sequence of 5 multiplication and division questions using the same two numbers.

## How Many Ways?

You have these cards. The red card, which is upside down, can be any number.

**How many different number sentences can you make?**

$\boxed{2} \quad \boxed{=} \quad \boxed{\times} \quad \color{red}{\blacksquare} \quad \boxed{\div} \quad \boxed{14}$

**Tip:** put the = sign in different positions in your number sentences.

## Which Answer?

3

$$2 \times \square = 12 \div 2$$

6

12

Explain the mistakes.

## Small Difference Questions

$5 \times 3 = \square$

$6 \times 5 = \square$

$24 \div 2 = \square$

$5 \times 3 = \square + 4$

$6 \times 5 = \square + 2$

$24 \div 2 = \square \times 3$

$5 \times 3 = \square - 4$

$6 \times 5 = \square \times 2$

$12 \div 2 = \square \times 3$

$5 \times 4 = \square - 4$

$6 \times 5 = \square \div 2$

$12 \div 2 = \square \div 3$

## How Many Ways?

The missing numbers are positive whole numbers.

**Fill the gaps:**

$3 \times \square = 16 - \square$

**Level 1:** I can find an answer

**Level 2:** I can find different answers

**Level 3:** I know how many answers there are

The first number must be less than...

## How Many Ways?

The missing numbers are positive whole numbers.

**Fill the gaps:**

$24 \div \square = 3 + \square$

**Level 1:** I can find an answer

**Level 2:** I can find different answers

**Level 3:** I know how many answers there are

My first answer was...

The next thing I tried was...

# I SEE REASONING Y3

## Answers

### Division, page 2:

**Read the Pictures:** Top left: 6 dice, 18 dots in total    Top right: 5 dice  
Bottom left: 6 dice    Bottom right: 7 dice

**Read the Pictures:** Top left: 18 dots    Top right: 9 columns  
Bottom left: 3 rows    Bottom right: 7 columns

### Division, page 3:

**Explore:** 6 triangles, 2 left over.    5 squares, 0 left over.  
4 pentagons, 0 left over    3 hexagons, 2 left over.

**Explore:** 4 triangles and 2 left over.    2 **pentagons** and 4 left over.

**Explore:** 4 squares and 2 left over.    3 **hexagons** and 0 left over.

### Division, page 4:

**Explain the Mistake:** Another triangle can be made with the four remaining matchsticks.

**Read the Pictures:** Top: 15    Bottom: 21

**Explain:** Question A: 4 triangles    Question B: 4 hexagons    Note that doubling the number of matchsticks and doubling the number of sides in each shape results in the same number of shapes able to be made.

### Division, page 5:

**Different Ways:** Possible shapes: triangle, square, hexagon, pentagon, dodecagon (12-sided shape)

**Different Ways:** Possible shapes: triangle, pentagon

**How Many Ways?** Six ways: 1 row, 20 columns    2 rows, 10 columns  
4 rows, 5 columns    5 rows, 4 columns    10 rows, 2 columns  
20 rows, 1 column

**Extend:** (a) 3 ways:  $4 \times 4$  array,  $8 \times 2$  array,  $16 \times 1$  array (6 ways with inverse arrays)

(b) 1 way:  $17 \times 1$  array (2 ways with inverse arrays)

(c) 2 ways:  $7 \times 3$  array and  $21 \times 1$  array (4 ways with inverse arrays)

# I SEE REASONING Y3

## Answers

### Division, page 6:

**Read the Pictures:** Both show  $15 \div 5$ : picture a shows grouping (3 lots of 5 in 15). Picture B shows sharing (15 shared into 5 groups, 3 in each group)

**Draw:** (a) picture of 2 two groups of 7 (b) picture of 7 groups of 2

**Draw:** (a) picture of 5 groups of 4 (b) picture of 4 groups of 5

### Division, page 7:

**Explain:** Both responses are correct. Joy is sharing, Zara is grouping.

**Read the Picture:** Tom uses a grouping story, Kam uses a sharing story, both stories are represented by the image.

**True or False?** True statements:  $24 \div 4 = 6$     $24 \div 6 = 4$     $4 = 24 \div 6$

### Division, page 8:

**I know... so...**  $14 \div 2 = 7$     $18 \div 2 = 9$     $16 \div 4 = 4$     $24 \div 8 = 3$

**I know... so...**  $32 \div 8 = 4$     $35 \div 7 = 5$     $20 \div 4 = 5$     $24 \div 4 = 6$

$18 \div 2 = 9$     $15 \div 3 = 5$     $21 \div 3 = 7$     $40 \div 5 = 8$

**I know... so...**  $27 \div 9 = 3$     $24 \div 3 = 8$     $45 \div 5 = 9$     $35 \div 5 = 7$

$20 \div 4 = 5$     $28 \div 4 = 7$     $21 \div 3 = 7$     $30 \div 6 = 5$

**Small Difference Questions:** Left column: 4, 6, 5, 10

Middle column: 2, 4, 5, 4   Right column: 12, 6, 3, 3

### Division, page 9:

**Small Difference Questions:** Left column: 6, 7, 4, 5

Middle column: 2, 4, 5, 5   Right column: 2, 9, 9, 8

**Read the Pictures:**  $16 \div 3 = 5$  remainder 1

**Read the Pictures:** Left picture:  $17 \div 5 = 3$  remainder 2

Right picture:  $19 \div 4 = 4$  remainder 3

### Division, page 10:

**Explain the Mistake:** The remainder is never greater than the divisor. Another square can be made with the 5 remaining matchsticks.

**Small Difference Questions:** Left column: 3   4   4 r 3   5 r 3   30

Right column: 3   5   5 r 2   6 r 1   41

**Small Difference Questions:** Left column: 3   6   6 r 4   8 r 2   25

Right column: 5   7   3 r 4   4 r 1   35



# I SEE REASONING Y3

## Answers

### Division, page 11:

**Explain:** Left question:  $14 \div 3 = 4 \text{ r } 2$  Right question:  $14 \div 3 = 4 \text{ r } 2$

**Different Ways:**  $14 \div 6 = 2 \text{ r } 2$      $14 \div 4 = 3 \text{ r } 2$      $14 \div 3 = 4 \text{ r } 2$   
 $31 \div 10 = 3 \text{ r } 1$      $31 \div 6 = 5 \text{ r } 1$      $31 \div 5 = 6 \text{ r } 1$      $31 \div 3 = 10 \text{ r } 1$

**Extend:** Left column: 4 6 3 36    Right column: 3 1 2 26

### Division, page 12:

**Explain:** Largest possible remainder = 3. The remainder is always less than the divisor otherwise another 'lot' of the divisor can be made.

**Explore:** Left section: 18    Middle section: 24    Right section: 16, 20  
 Outside: 14

**Explore:** Left section: 24    Middle section: 20, 100    Right section: 50  
 Outside: 34

### Division, page 13:

**Explain:**  $36 \div 3 = 12$      $60 \div 5 = 12$      $26 \div 2 = 13$

**Which Method:** Red is correct as 30 and 15 are multiples of 3

**Agree or Disagree?** Both methods are correct

**I know... so...** Left column: 12    Middle column: 6, 16  
 Right column: 10, 3, 13

### Division, page 14:

**Part-Complete Examples:**  $30 \div 3 = 10$      $9 \div 3 = 3$      $39 \div 3 = 13$   
 $40 \div 4 = 10$      $12 \div 4 = 3$      $52 \div 4 = 13$      $50 \div 5 = 10$      $20 \div 5 = 4$      $70 \div 5 = 14$   
 $30 \div 3 = 10$      $24 \div 3 = 8$      $54 \div 3 = 18$

**Explain the Mistakes:** Mistake A: 50 and 6 are not multiples of 4  
 Mistake B:  $25 \div 5 = 5$

**Different Ways:**  $50 \div 5 = 10$      $60 \div 5 = 12$      $40 \div 5 = 8$      $60 \div 5 = 12$   
 $40 \div 4 = 10$      $64 \div 4 = 16$      $32 \div 4 = 8$      $64 \div 4 = 16$

# I SEE REASONING Y3

## Answers

### Division, page 15:

**Rank by Difficulty:**  $38 \div 4 = 9 \text{ r } 2$      $80 \div 5 = 16$      $27 \div 9 = 3$      $100 \div 4 = 25$   
 $40 \div 3 = 13 \text{ r } 1$

**How Many Ways?** 8 ways:  $10 \div 2 = 5$      $10 \div 5 = 2$      $20 \div 4 = 5$   
 $20 \div 5 = 4$      $30 \div 6 = 5$      $30 \div 5 = 6$      $40 \div 8 = 5$      $40 \div 5 = 8$

**How Many Ways?** 6 ways:  $18 \div 2 = 9$      $18 \div 9 = 2$      $28 \div 7 = 4$      $28 \div 4 = 7$   
 $48 \div 6 = 8$      $48 \div 8 = 6$

### Multiplication and Division, page 16:

**Contexts:** (a) and (c) are  $15 \div 5$     (b) is  $15 \times 5$     (d) is  $15 - 5$

**Explain the Mistakes:** Left example:  $7 \times 5 = 35$  sweets in total  
 Middle example:  $5 + 3 = 8$  pets    Right example:  $8 \div 4 = 2$  tents needed

**Read the Pictures:** Top example story: 6 apples in a pack. How many apples in 3 packs?    Middle bar model: whole = 16, part = 9, missing part  
 Bottom example story: 30 sweets are shared between 5 friends. How many sweets each?

### Multiplication and Division, page 17:

**Which Answer?** Top: red    Bottom: both

**Which Picture?** Middle bar model is correct. Left bar model is incorrect as it does not represent multiplication. Right bar model is incorrect because there are 4 lots of 7 days in February, not 7 lots of 4 days.

**Small Difference Questions:** (a) 9 children    (b) 18 boys    (c) 18 girls

### Multiplication and Division, page 18:

**Different Ways:** 8 or 9 (using decimals, numbers inside the range 7.5→10)

**Estimate:** Exact answers: 24    30    18    6 (children estimate spatially)

**Estimate:** Exact answers: 28    20    30    25 (children estimate spatially)

# I SEE REASONING Y3

## Answers

### Multiplication and Division, page 19:

**Estimate:** 1<sup>st</sup> line: have 3 equal sections of length 4 to position 12

2<sup>nd</sup> line: have 4 equal sections of length 3 to position 12

3<sup>rd</sup> line: Split 36 into 3 equal sections to position 12

4<sup>th</sup> line: split 120 into 10 equal sections to position 12 (halve the intervals)

**Estimate:** 1<sup>st</sup> line: have 5 equal sections of length 8 to position 40

2<sup>nd</sup> line: have 4 equal sections of length 10 to position 40

3<sup>rd</sup> line: Split 120 into 3 equal sections to position 40

4<sup>th</sup> line: split 160 into 4 equal sections to position 40

**Context:** Paul is 40 or 44 years old

### Multiplication and Division, page 20:

**Read the Pictures:** Example number sentences explore the inverse relationship between multiplication and division, place value and the layout of number sentences either side of the = sign.

Examples:  $12 \div 6 = 2$     $6 \times 2 = 12$     $12 = 6 \times 2$     $60 \times 2 = 120$     $120 \div 2 = 60$

**Agree or Disagree?** Correct answers (top): blue, green, orange.

Correct example (bottom): light blue

**Which Answer?** The blue answer is correct.

### Multiplication and Division, page 21:

**Odd One Out:** Top question:  $\_\_ \div 2 = 10$    Bottom question:  $\_\_ \times 3 = 12$

**Small Difference Questions:** Left column: 16, 4, 4, 4, 16

Middle column: 2, 2, 50, 50, 2   Right column: 5, 80, 80, 80, 5

**How Many Ways?** 16 ways:  $2 \times 7 = 14$     $7 \times 2 = 14$     $14 = 2 \times 7$     $14 = 7 \times 2$

$2 \times 14 = 28$     $14 \times 2 = 28$     $28 = 14 \times 2$     $28 = 2 \times 14$     $14 \div 2 = 7$     $14 \div 7 = 2$

$2 = 14 \div 7$     $7 = 14 \div 2$     $28 \div 14 = 2$     $28 \div 2 = 14$     $14 = 28 \div 2$     $2 = 28 \div 14$

# I SEE REASONING Y3

## Answers

**Multiplication and Division, page 22:**

**Which Answer?** Correct answer: 3

**Small Difference Questions:** Left column: 15, 11, 19, 24

Middle column: 30, 28, 15, 60      Right column: 12, 4, 2, 18

**How Many Ways?** 5 ways:  $3 \times 1 = 16 - 13$     $3 \times 2 = 16 - 10$     $3 \times 3 = 16 - 7$   
 $3 \times 4 = 16 - 4$     $3 \times 5 = 16 - 1$

**How Many Ways?** 5 ways:  $24 \div 6 = 3 + 1$     $24 \div 4 = 3 + 3$     $24 \div 3 = 3 + 5$   
 $24 \div 2 = 3 + 9$     $24 \div 1 = 3 + 21$

# I SEE MATHS RESOURCES

A range of resources for developing deep, visual mathematics can be found at [www.iseemaths.com](http://www.iseemaths.com)

The ***I See Reasoning*** eBooks are available here:

[I See Reasoning Y3](#)

[I See Reasoning Y4](#)

[I See Reasoning Y5](#)

[I See Reasoning Y6](#)

The ***I See Problem-Solving*** eBooks are available here:

[I See Problem-Solving – UKS2](#)

[I See Problem-Solving – LKS2](#)

iPad app [Logic Squares](#) gets children applying calculation facts and thinking strategically as children complete crossword-style number sentences.

Information about conferences and in-school training led by Gareth Metcalfe can be found at [www.iseemaths.com](http://www.iseemaths.com) with a range of CPD options available. There are also a wide range of online training events running throughout the year.

## **Social Media:**

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