

# I SEE REASONING YEAR 5

Tasks to inspire mathematical thinking

# SAMPLE

$$468 - 241 =$$

$$462 - 235 =$$

$$432 - 215 =$$

What do you notice?

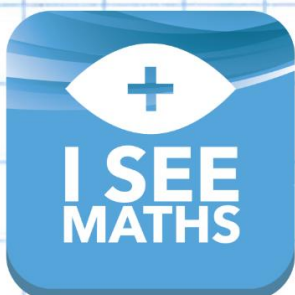
Can you order your

workings so that you  
can find all the  
possible answers?

True or False?

$$15 \times 12 = 30 \times 6$$

$$20 \times 20 = 22 \times 18$$



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Available for digital download

## Different Methods

*What is different about how you answer each question?*

$480 \div 4 = \square$

$480 \div 6 = \square$

$480 \div 10 = \square$

$480 \div 20 = \square$

$480 \div 240 = \square$

## I know... so...

$72 \div 3 = 24$

$78 \div 3 = \square$

$84 \div 6 = 14$

$168 \div 6 = \square$

$48 \div 6 = 8$

$108 \div 6 = \square$

$98 \div 7 = 14$

$91 \div 7 = \square$

$72 \div 4 = 18$

$144 \div 8 = \square$

$112 \div 4 = 28$

$192 \div 4 = \square$

## Small Difference Questions

$48 \div 3 = 16$

$54 \div 3 = \square$

$108 \div 3 = \square$

$108 \div 6 = \square$

$216 \div 12 = \square$

$64 \div 8 = 8$

$64 \div 4 = \square$

$104 \div 4 = \square$

$144 \div 4 = \square$

$144 \div 8 = \square$

## Small Difference Questions

$56 \div 4 = 14$

$108 \div 3 = 36$

$112 \div 4 = \square$

$216 \div 6 = \square$

$224 \div 8 = \square$

$216 \div 3 = \square$

$304 \div 8 = \square$

$246 \div 3 = \square$

$344 \div 8 = \square$

$261 \div 3 = \square$

## Which Operation?

$100 \div \square = 20$

$\square = 20 \div 4$

$40 \times \square = 200$

$\square \div 100 = 20$

$4 = \square \div 20$

For each question, do you **multiply** or **divide** to find the missing number?

## Contexts

Question	number sentence
16 children share some sweets. They get 4 sweets each. <b>How many sweets?</b>	$\square \div 16 = 4$
90 eggs are packed into 15 boxes. <b>How many eggs in each box?</b>	

Write a question for  $\square \div 5 = 60$  and  $60 \div \square = 5$

## Estimate

$165 \div 6$

Whole number answer?

**Yes**    **Possibly**    **No**

$120 \div 6 = 20$      $180 \div 6 = 30$

Estimate for  $165 \div 6$

$344 \div 8$

Whole number answer?

**Yes**    **Possibly**    **No**

$320 \div 8 = 40$      $400 \div 8 = 50$

Estimate for  $344 \div 8$

## Estimate

$705 \div 3$

Whole number answer?

**Yes**    **Possibly**    **No**

$600 \div 3 = 200$      $900 \div 3 = 300$

Estimate for  $705 \div 3$

$719 \div 4$

Whole number answer?

**Yes**    **Possibly**    **No**

$400 \div 4 = 100$      $800 \div 4 = 200$

Estimate for  $719 \div 4$

## Explain

For this task, **do not** work out the answers to the questions.

For each question, the answer has **how many digits?**

$70 \div 5$

digit(s)

$3000 \div 4$

digit(s)

$615 \div 5$

digit(s)

$435 \div 5$

digit(s)

$3075 \div 3$

digit(s)

Explain how you know.

# Which Answer?

$$92 \div 4 = \square$$

To answer, split 92 into 90 and 2

To answer, split 92 into 80 and 12

To answer, split 92 into 88 and 4

## Next Step

In each calculation, **what's the remainder?**

$$6 \overline{) 8^2 4} \begin{matrix} 1 & 4 \\ & \end{matrix}$$

$$3 \overline{) 4 \square 5} \begin{matrix} 1 \\ & \end{matrix}$$

$$3 \overline{) 5 \square 5} \begin{matrix} 1 \\ & \end{matrix}$$

$$3 \overline{) 6 \square 5} \begin{matrix} 2 \\ & \end{matrix}$$

$$3 \overline{) 7 \square 5} \begin{matrix} 2 \\ & \end{matrix}$$

$$4 \overline{) 7 \square 6} \begin{matrix} 1 \\ & \end{matrix}$$

$$4 \overline{) 8 \square 6} \begin{matrix} 2 \\ & \end{matrix}$$

$$4 \overline{) 9 \square 6} \begin{matrix} 2 \\ & \end{matrix}$$

$$8 \overline{) 9 \square 6} \begin{matrix} 1 \\ & \end{matrix}$$

## Next Step

In each calculation, **what's the remainder?**

$$3 \overline{) 5^2 8^1 2} \begin{matrix} 1 & 9 & 4 \\ & & \end{matrix}$$

$$4 \overline{) 8 \square 6 \square 4} \begin{matrix} 2 & 1 \\ & & \end{matrix}$$

$$4 \overline{) 9^1 \square 6 \square 4} \begin{matrix} 2 & 4 \\ & & \end{matrix}$$

$$4 \overline{) 6^2 \square 6 \square 4} \begin{matrix} 1 & 6 \\ & & \end{matrix}$$

$$3 \overline{) 2 \square 6 \square 1} \begin{matrix} 0 \\ & \end{matrix}$$

$$3 \overline{) 6 \square 7 \square 5} \begin{matrix} 2 & 2 \\ & & \end{matrix}$$

$$3 \overline{) 7^1 \square 7 \square 4} \begin{matrix} 2 & 5 \\ & & \end{matrix}$$

## Part-Complete Examples

The calculations have been started. **Finish them:**

$$4 \overline{) 5^1 2}$$

$$4 \overline{) 9 2}$$

$$4 \overline{) 8 9 2}$$

$$8 \overline{) 8 9 2}$$

$$8 \overline{) 4^4 9 2}$$

$$4 \overline{) 7 9 2}$$

## Part-Complete Examples

The calculations have been started. **Finish them:**

$$3 \overline{) 8^2 5 2}$$

$$3 \overline{) 8^2 6 2}$$

$$3 \overline{) 7 6 2}$$

$$6 \overline{) 4^4 4 8}$$

$$6 \overline{) 8^2 4 8}$$

$$6 \overline{) 8 3 8}$$

## Which Answer?

$$745 \div 4$$

**Find the correct calculation.**  
*Spot the mistakes.*

$$4 \overline{) 7^3 4^2 5} \begin{array}{l} 185 \text{ r } 5 \end{array}$$

$$4 \overline{) 7^3 4^2 5} \begin{array}{l} 186 \text{ r } 1 \end{array}$$

$$4 \overline{) 7^3 4^2 5} \begin{array}{l} 196 \text{ r } 1 \end{array}$$

## Explain the Mistakes

$$5258 \div 6$$

$$\begin{array}{r} 0886r2 \\ 6 \overline{)5^5 2^4 5^3 8} \end{array}$$

$$\begin{array}{r} 0876 \\ 6 \overline{)5^5 2^4 5^3 8} \end{array}$$

$$\begin{array}{r} 0873 \\ 6 \overline{)5^5 2^4 5^1 8} \end{array}$$

## Form of Answer

$$\begin{array}{r} 08r3 \\ 6 \overline{)5^5 1} \end{array}$$

Question	Answer
Eggs are put in boxes of 6. The farmer has 51 eggs. <b>How many boxes does he need for all the eggs?</b>	<b>9 boxes</b>
A sunflower grows to a height of 51 cm in 6 weeks. <b>On average, how many centimetres does it grow each week?</b>	
51 children turn up for a 6-a-side football tournament. <b>How many teams can be made?</b> <i>Teams can have substitutes.</i>	
An artist works on a masterpiece for 51 hours over 6 days. <b>On average, how long does she work each day?</b>	

## Form of Answer

Jess sleeps for 29 hours over 4 nights.

**On average, how long is she asleep each night?**

7 hours 15 minutes

7.1 hours

7 hours 10 minutes

## Mental or Written?

$320 \div 3 =$

$320 \div 6 =$

$320 \div 9 =$

$320 \div 5 =$

$320 \div 8 =$

$320 \div 10 =$

Which questions use the same/different calculation methods?

## Mental or Written?

$540 \div 4 =$

$540 \div 6 =$

$540 \div 7 =$

$550 \div 55 =$

$550 \div 25 =$

$550 \div 15 =$

Which questions use the same/different calculation methods?

## Small Difference Questions

$560 \div 4 = \square$

$441 \div 3 = \square$

$560 \div 8 = \square$

$4410 \div 30 = \square$

$560 \div 7 = \square$

$441 \div 6 = \square$

$560 \div 9 = \square$

$501 \div 6 = \square$

$567 \div 9 = \square$

$501 \div 3 = \square$

$1134 \div 9 = \square$

$1503 \div 9 = \square$



## Rank by Difficulty

$546 \div 6 =$

$340 \div 20 =$

$500 \div 3 =$

$425 \div 5 =$

$550 \div 30 =$

## Broken Calculator

*'The 6 and 8 keys on my calculator are broken!'*

**How can I use my calculator to work out:**

$522 \div 6 =$

$624 \div 8 =$

## How Many Ways?

**Complete using digits 0-9.**

*Position the digit 6 as shown.*

$$\square \square 6 \div \square = \square \square$$

**Level 1:** *I can find a way*

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

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

**My system for knowing I have found all of the answers is...**

# I SEE REASONING – Y5

## Answers

### Division, page 2:

**Different Methods:** Possible methods:  $480 \div 4 = 120$  (halve twice)  
 $480 \div 6 = 80$  ( $6 \times 8 \times 10$ )     $480 \div 10 = 48$  (move digits one column)  
 $480 \div 20 = 24$  ( $480 \div 2 \div 10$ )     $480 \div 240 = 2$  (counting the 240s in 480)

**I know... so...**  $78 \div 3 = 26$  (2 more 3s)     $168 \div 6 = 28$  (double)  
 $108 \div 6 = 18$  (10 more 6s)     $91 \div 7 = 13$  (1 less 7)     $144 \div 8 = 18$  (doubling the dividend and the divisor = same quotient)     $192 \div 4 = 48$  (20 more 4s)

**Small Difference Questions:** First column: 18, 36, 18, 18  
 Second column: 16, 26, 36, 18

### Division, page 3:

**Small Difference Questions:** First column: 28, 28, 38, 43  
 Second column: 36, 72, 82, 87

**Which Operation?**  $100 \div 5 = 20$  (division)     $2000 \div 100 = 20$  (multiplication)  
 $40 \times 5 = 200$  (multiplication)     $5 = 20 \div 4 = 5$  (division)     $4 = 80 \div 20$  (multiplication)

**Contexts:**  $64 \div 16 = 4$     Number sentence:  $90 \div \square = 15$

Example question: Some people are going to the match. 5 people travel in each car and there are 60 cars. How many people are going to the match?

Example question: The bill for a group of friends at the café is £60. Each person pays £5. How many friends at the café?

### Division, page 4:

**Estimate:**  $165 \div 6$  can't give a whole number answer. A reasonable estimate will be significantly nearer to 30 than to 20.

$344 \div 8$  could give a whole-number answer but it isn't immediately obvious if it does. A reasonable estimate will be nearer to 40 than to 50.

**Estimate:**  $705 \div 3$  could give a whole-number answer although it isn't immediately obvious that it does. A reasonable estimate will be nearer to 200 than to 300.

$719 \div 4$  can't give a whole number answer. A reasonable estimate will be significantly nearer to 200 than to 100.

**Explain:**  $70 \div 5$ : 2-digits (more than  $10 \times 5$ ).  $435 \div 5$ : 2-digits (less than  $100 \times 5$ ).  $3000 \div 4$ : 3-digits (less than  $1000 \times 4$ ).  $3075 \div 3$ : 4-digits (more than  $1000 \times 4$ ).  $615 \div 5$ : 3-digits (more than  $100 \times 5$ ).

# I SEE REASONING – Y5

## Answers

### Division, page 5:

**Which Answer?** The green answer is incorrect because 90 and 2 are not multiples of 4. The blue and red responses are correct. When using written calculation we partition as shown by the blue response.

**Next Step:** Top row: 1 2 0 1      Bottom row: 3 0 1 1

**Next Step:** Top row: 2 0 2      Bottom row: 2 1 2

### Division, page 6:

**Part-Complete Examples:** Top row: 13    23    223  
Bottom row: 111 r 4    61 r 4    198

**Part-Complete Examples:** Top row: 284    287 r 1    254  
Bottom row: 74 r 4    141 r 2    139 r 4

**Which Answer?** The middle answer is correct. Left-hand calculation incorrect because the remainder is larger than the divisor. Right-hand calculation incorrect because there are not 9 lots of 4 in 34.

### Division, page 7:

**Explain the Mistakes:** Left example: there are 7 lots of 6 in 45, not 8 lots.

Middle example: the answer has a remainder of 2

Right example: the final remainder carried should be 3 rather than 1 (the difference between  $7 \times 6$  and 45 is 3).

**Form of Answer:** Sunflower = 8.5cm    8 teams (3 teams have a substitute)  
8 hours 30 minutes

**Form of Answer:** The red answer is correct.  $29 \div 4 = 7 \text{ r } 1$  and that represents quarter of an hour.

# I SEE REASONING – Y5

## Answers

### Division, page 8:

**Mental or Written?**  $320 \div 3 = 106 \text{ r } 2$ , partitioning 320 into 300 and 20 so may not require written method.  $320 \div 5 = 64$ , can be done as  $320 \div 10 \times 2$ .  $320 \div 6 = 53 \text{ r } 2$ , partitioning 320 into 300 and 20 so may not require written method.  $320 \div 8 = 40$ , can be done mentally.  $320 \div 9 = 35 \text{ r } 5$ , likely to require written method.  $320 \div 10 = 32$ , can be done mentally.

**Mental or Written?**  $540 \div 4 = 135$ , can calculate by halving twice.  $540 \div 6 = 90$ , can be done mentally.  $540 \div 7 = 77 \text{ r } 1$ , likely to require written method.  $550 \div 55 = 10$ , can be done mentally using place value knowledge.  $550 \div 25 = 22$ , can be done mentally if we know  $100 \div 25 = 4$ .  $550 \div 15 = 36 \text{ r } 10$ , likely to require a written method.

**Small Difference Questions:** Left column: 140 70 80 62r2 63 126  
Right column: 147 147 73.5 83.5 167 167

### Division, page 9:

**Rank by Difficulty:** Example methods:  $340 \div 20 = 17$ , same as  $34 \div 2$   
 $546 \div 6 = 91$ , partitioning 546 into 540 and 6 which may be done mentally.  
 $500 \div 3 = 166 \text{ r } 2$ , likely to require a written method.

$425 \div 5 = 85$ , can be done by  $425 \div 10 \times 2$

$550 \div 30 = 18 \text{ r } 10$ , can use  $55 \div 3 = 18 \text{ r } 1$

**Broken Calculator:** Example methods:  $522 \div 2 \div 3 = 87$

$624 \div 8 = 312 \div 4 = 78$

**How Many Ways?** 6 ways:  $36 \div 2 = 18$      $76 \div 2 = 38$      $86 \div 2 = 43$

$96 \div 2 = 48$      $76 \div 4 = 19$      $96 \div 4 = 12$

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