



Think Academy



Lesson 1 - 7

Think Academy



Name: _____

© 2023 Think Academy International Education Limited

First printed by GH Cityprint (t/a Opal Blitz Ltd) 2023

This Study Material is provided by Think Academy International Education Limited (Company number: 12489904; registered address: Suite 1, 3rd Floor 11 – 12 St. James' s Square, London SW1Y 4LB, United Kingdom, "Think Academy UK").

All intellectual property rights (including but not limited to text, illustrations copyright and moral rights), except for where specified in the Study Material, are owned by Think Academy UK.

All rights reserved. This Study Material is provided as part of Think Academy UK' s services; it must not be distributed or sold separately. No part of this Study Material may be distributed, sold, reproduced, stored in or introduced into a retrieval system, or transmitted, in any form, or by any means (electronic, mechanical, photocopying, recording or otherwise) without the prior written permission of Think Academy UK. Any person who does any unauthorised act in relation to this Study Material may be liable to criminal prosecution and civil claims for damages.

PREFACE

Welcome to your Think Academy maths course, we're delighted that you've chosen to learn with us!

About Think Academy

Think Academy is part of the NYSE-listed TAL Education Group, trusted by over 30 million students and their families across the globe.

Over the past 18 years, Think Academy's expertise has focused on curriculum development and maths tuition, supporting students to excel in primary school level mathematics.

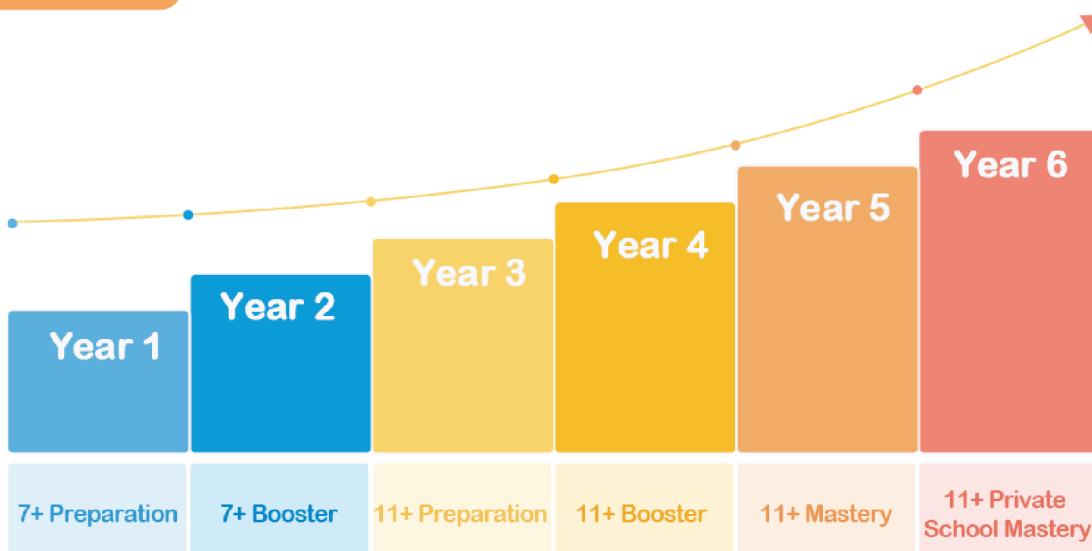
Our bespoke online maths courses harness the power of technology to ensure students achieve their full potential at primary school and throughout their 11+ journey.

Throughout this online maths course, you and your child will experience a fully guided learning process, led by their tutor with additional support from the tutor's assistant.

This course will introduce your child to new and challenging mathematical concepts. Their tutor will encourage your child to break boundaries by using the problem-solving techniques and fast calculation skills required to achieve 11+ mastery.

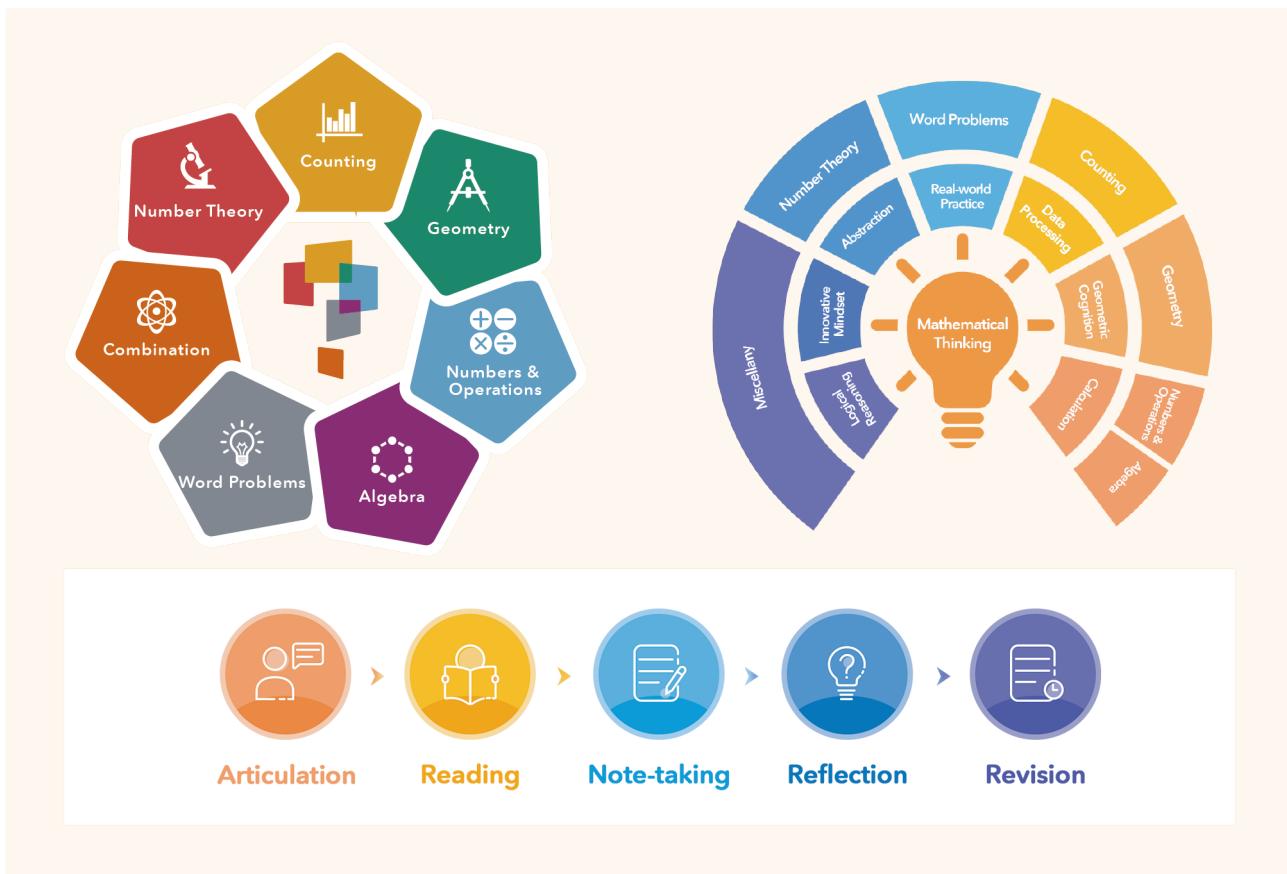
When it's time for class, open the Think Academy Classroom app to get started.

Our curriculum

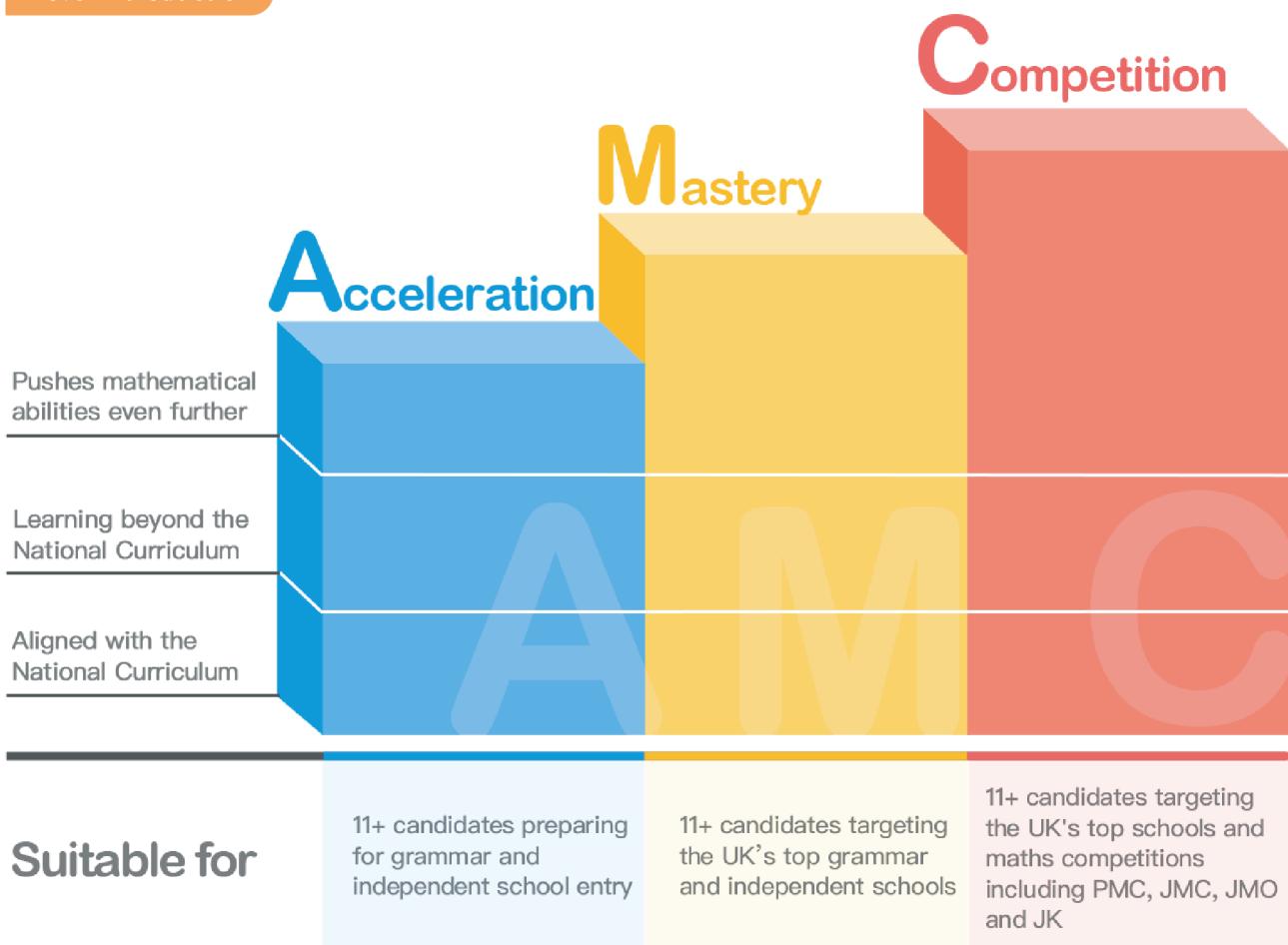


Think Academy's curriculum is designed to ensure students develop the necessary skills required for success in the UK National Curriculum, and later, in the 11+ exam. That is why our curriculum centres around the modules consistently used in all types of secondary school entrance exams.

Our curriculum



Level introduction



Learning Guidance

Before Class

- Let's Get Ready

Think about the skills and topics you have already learned that will be useful this lesson!

In Class

- Learn and Discover

Build on what you know by learning more about the topic and discover new ways to answer questions!

- Exploration

Your teacher will help you to understand the topic, exploring smart ways to answer difficult questions!

- Practice

Now you can try to answer some questions using your new skills!

- Reasoning

See if you can find any mistakes and find ways to correct them!

- Challenge

Stretch yourself by using your new skills to answer some more difficult questions!

Homework

- Teaching Time

Now you've learned these new skills, record yourself teaching your family how to answer a question from this topic!

- Four Days of Exercises

There are four days of exercises, 5 questions per day, to consolidate what you have learnt and to improve your speed and accuracy!

- Extensive Challenges

There are 5 challenging questions at the end of each lesson. It is not recommended to start this section unless you have mastered all the previous questions. This section provide you an exposure to challenging questions and an opportunity to reach for the higher class levels!

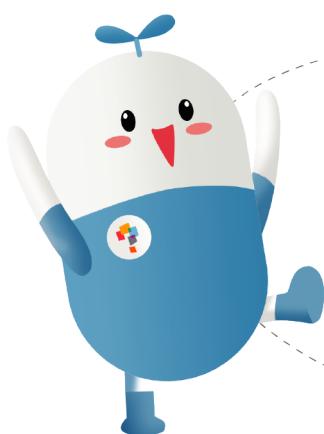
Welcome to the Think Academy Team!



Hi! My name's Pip. I'm going to be your guide as we go on an amazing maths adventure together!



And my name's Bud! I think maths can be fun for everyone - let me show you why!



There are lots of different things to learn, but don't worry, we'll be with you every step of the way!

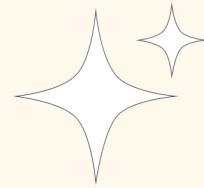


We'll teach you some super smart and fun ways to work out the most difficult maths problems...

*Congratulations!
You have completed your adventure!*

Contents

Lesson 1	Defining New Operations (1).....	01
Lesson 2	Addition and Subtraction Skills (3).....	21
Lesson 3	Listing Method (2).....	34
Lesson 4	Short Division.....	51
Lesson 5	Understanding Fractions (6).....	68
Lesson 6	Time Problems (4).....	86
Lesson 7	Basic Word Problems with Fractions.....	103



Lesson 1

Defining New Operations (1)



Let's Look Back

Equations with Blanks

About this Lesson

Defining New Operations (1)

Let's Look Ahead

Defining New Operations (2)

Objectives

- Operate according to new arithmetic rules
- Find input/output numbers in function machines
- Find the rules based on inputs and outputs

Let's Get Ready

- 1 Fill in the blanks.

$$\underline{\quad} + 30 = 42$$

$$\underline{\quad} - 6 = 50$$

$$\underline{\quad} \times 3 = 15$$

$$\underline{\quad} \div 5 = 10$$

- 2 If $\Omega = 5 + \Theta \times 10$ and $\Theta = 2$. Find the value of Ω .

- 3 If $\star = \Delta \times 2 + \bigcirc$, $\Delta = 5$ and $\bigcirc = 8$. Find the value of \star .

In Class

Learn and Discover

In a particular kind of arithmetic $a \nabla b$ means multiply a by two and subtract b .

For example, $4 \nabla 3 = 4 \times 2 - 3 = 5$.

Work out: $8 \nabla 10$.

Pip and Bud got different answers:



$$8 \nabla 10 = 10 \times 2 - 8 = 12$$



$$8 \nabla 10 = 8 \times 2 - 10 = 6$$

Who do you agree with?

- A. Pip
- B. Bud
- C. Both of them are wrong

Handwriting practice area with five horizontal lines and a vertical margin line on the left.

Exploration 1

$N\forall B$ represents 3 times N add B . For example: $1\forall 2 = 1 \times 3 + 2 = 5$. Therefore,
 $12\forall 6 = \underline{\hspace{2cm}}$.

Exploration 2

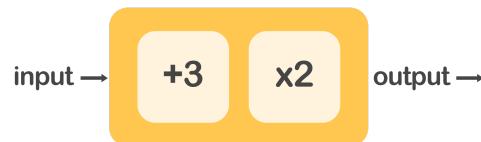
“ \odot ” represents a new operation. Given that $1 \odot 4 = 1 \times 2 \times 3 \times 4 = 24$,
 $5 \odot 3 = 5 \times 6 \times 7 = 210$, $7 \odot 2 = 7 \times 8 = 56$. Based on this rule, we know that
 $2 \odot 4 = \underline{\hspace{2cm}}$; $4 \odot 2 = \underline{\hspace{2cm}}$.

Practice

Suppose that $2 * 3 = 2 + 3 + 4 = 9$, $4 * 2 = 4 + 5 = 9$, $3 * 4 = 3 + 4 + 5 + 6 = 18$.
Then $7 * 6 = \underline{\hspace{2cm}}$.

Learn and Discover

The function machine below adds 3 to the input number then multiplies it by 2.



For example, if you input 1, then $1 + 3 = 4$, $4 \times 2 = 8$. So the output should be 8.

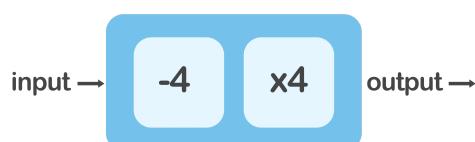
(1) If you input 10, the output will be ____.

(2) If you input one number and get 100 as the output, the input number was ____.



Exploration 3

The function machine below changes numbers follows the rule: subtract 4 and then multiply by 4.

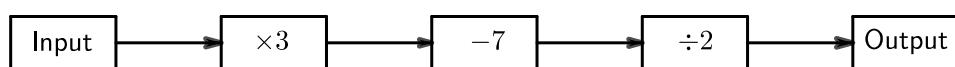


Complete the input and output table for the function machine.

input	output
10	24
7	
50	
	44
	80

Practice

When 13 is the input of this function machine, what is the output? _____



Learn and Discover

- 1 A number machine gives the input and output table as shown.

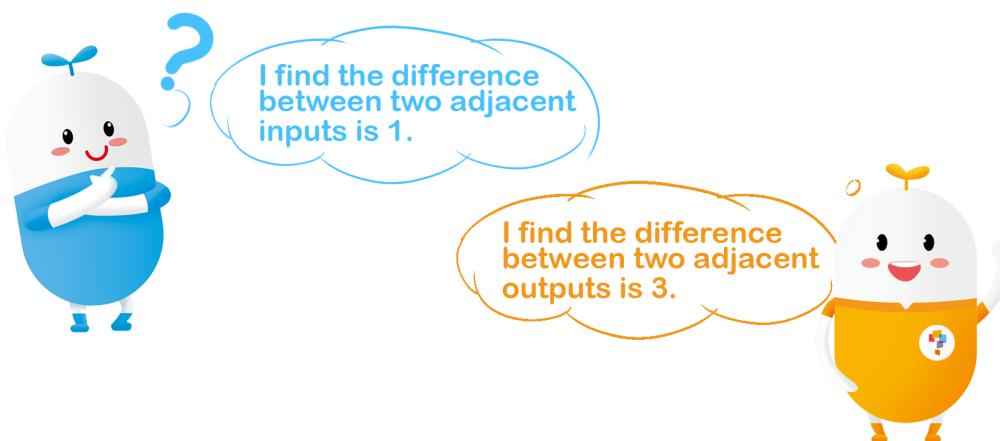
input	output
2	6
3	9
4	12

What is the rule of this number machine?

- 2 A number machine gives the input and output table as shown.

input	output
2	4
3	7
4	10

What is the rule of this number machine?



What is the relationship between these two differences? Can you find the rule through the relationship?

•

•

•

•

•

Exploration 4

A number machine gives the input and output table as shown.

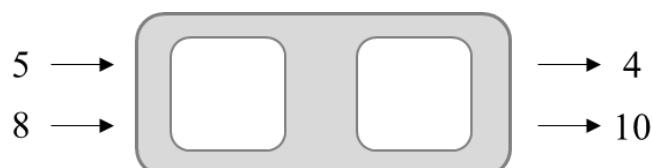
input	output
5	21
7	29
9	37

- (1) What is the rule of this number machine?
- (2) If you input 100, then you can get _____ as the output.

Reasoning

Is Pip correct? If not, please correct his answer!

The two-stage function machine will give the results shown below. If the input is 3, what is the output?

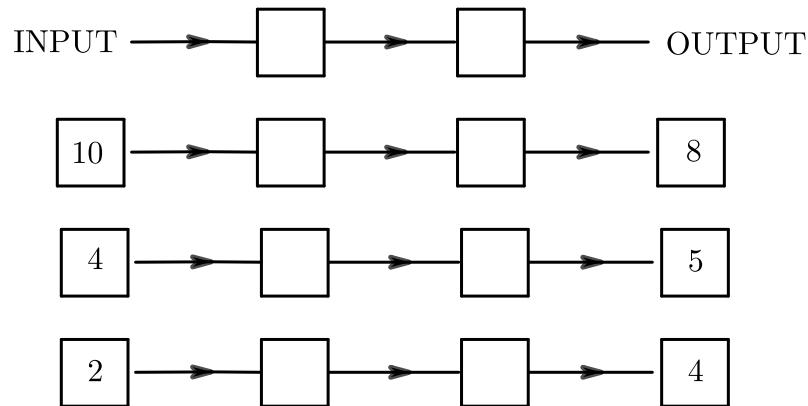


Pip's answer:

$5 - 1 = 4$, so the rule is: subtract 1 from the input. When 3 is the input, the output is $3 - 1 = 2$.

Challenge

Find the rule of this two-stage function machine.



Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

If $a | b = 2 \times a + 3 \times b$, then $4 | 5 = \underline{\hspace{2cm}}$.



Day 1

- 1 Given that $x \otimes y = 6 \times x - 5 \times y$, find $7 \otimes 6$.
- A. 12 B. 13 C. 42 D. 30

2 Given a and b are whole numbers, and $a \circledR b = a \times 3 + b \div 2$. Therefore, $6 \circledR 8 =$
_____.

3 Given a and b are whole numbers, and $a \otimes b = a \div 3 + b \times 4$, what is $6 \otimes 10$?

4 Given that $A \Psi B = A \times B - A - B + 10$, find $4 \Psi 3$. _____

5 Given \vee defines a new operation such that $a \vee b = a \times b + a - b$. Find $7 \vee 12$.



Day 2

- 1 "θ" represents a new operation. Given that $1\theta 1 = 31$, $1\theta 10 = 13$, $100\theta 1 = 301$, $1\theta 100 = 103$. Then $10\theta 5 = \underline{\hspace{2cm}}$, $5\theta 10 = \underline{\hspace{2cm}}$.

- 2 "★" represents a new operation. Given that $1★3 = 5$, $6★9 = 16$ and $5★7 = 13$, $2★8 = \underline{\hspace{2cm}}$

- 3 "★" represents a new operation. Given that
 $★3 = 1 + 2 + 3 = 6$,
 $★5 = 1 + 2 + 3 + 4 + 5 = 15$,
 $★8 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36$,
 $★10 = \underline{\hspace{2cm}}$.

4 Given that Ω defines a new operation and

$$1 \Omega 4 = 1 + 11 + 111 + 1111 = 1234,$$

$$2 \Omega 3 = 2 + 22 + 222 = 246,$$

$$3 \Omega 2 = 3 + 33 = 36, \dots$$

(1) $2 \Omega 4 = \underline{\hspace{2cm}}$

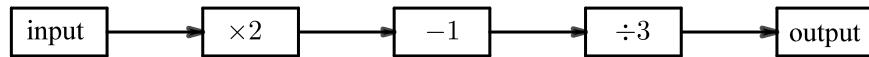
(2) $4 \Omega 2 = \underline{\hspace{2cm}}$

5 If $2! = 1 \times 2$, $3! = 1 \times 2 \times 3$, $4! = 1 \times 2 \times 3 \times 4$, then $6! = \underline{\hspace{2cm}}$.

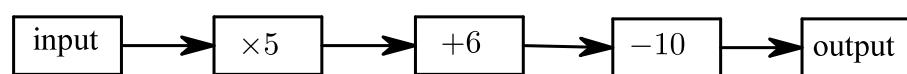


Day 3

- 1 According to the operation procedure outlined in the diagram, if the input is 11, the output will be ____.

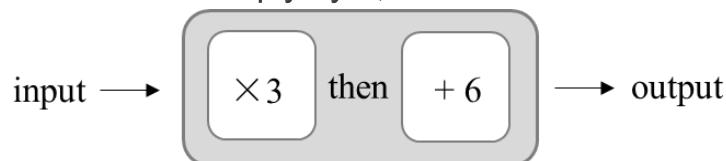


- 2 If you input 30 in the following function machine, you would get ____ as the output.



- 3 The number machine below changes numbers according to the rule:

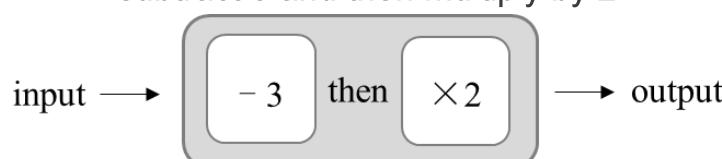
multiply by 3, then add 6



Complete the input and output table for the machine.

input	output
1	9
7	____
10	____
____	24
____	66

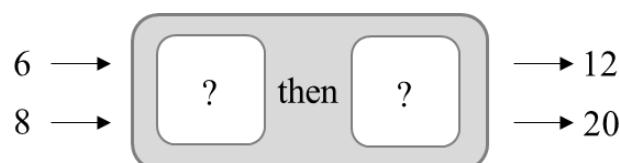
- 4 The number machine below changes numbers according to the rule
subtract 3 and then multiply by 2



Complete the input and output table for the machine.

input	output
10	14
5	_____
30	_____

- 5 The two stage function machine gives the results shown below. According to the rules of the function machine, what is the output when the input is 3?
- _____





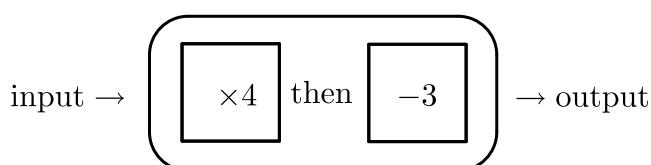
Day 4

- 1 A number machine gives the input and output table as shown.

Input	Output
2	1
4	5
10	17
15	27

What is the rule of this number machine?

- 2 (1) Sally has the number machine shown below.



Complete the table of input and output numbers for Sally's machine.

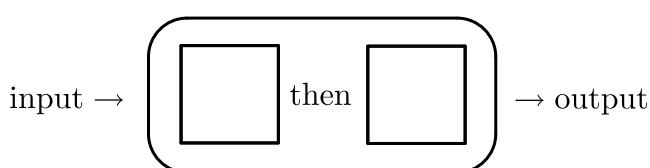
input	output
2	5
6	
	33
	1

- (2) Imogen has a different number machine which produced the following table of input and output numbers.

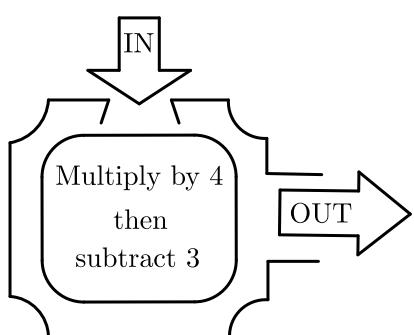
input	output
3	12
5	22
7	32

Unfortunately, the labels have fallen off Imogen's machine.

Write suitable labels on the diagram below.

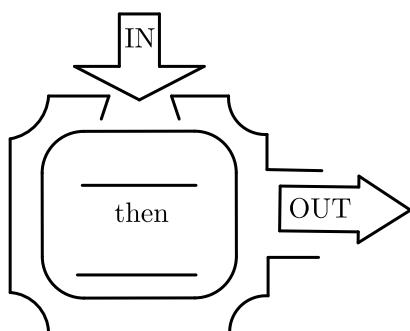


- 3 (1) Complete the table of values for this number machine with the rule 'multiply by 4, then subtract 3'.



Number IN	Number OUT
7	25
2	5
10	
	81

(2) What is the rule for this number machine? Write your answer inside the machine.



Number IN	Number OUT
2	17
7	52
9	66
10	73

4 A number machine gives the input and output table as shown.

input	output
12	3
14	4
16	5

(1) What is the rule of this number machine?

(2) If you input 36, then you can get _____ as the output.

5 A number machine gives the input and output table as shown.

input	output
12	12
15	13
21	15

(1) What is the rule of this number machine?

(2) If you input 60, then you can get _____ as the output.



Extensive Challenges

1 Given $M * N = 2 \times M + 3 \times N$, $4 * (5 * 2) = \underline{\hspace{2cm}}$.

2 When I **dib** two numbers, I add twice the first number to three times the second.

For example,

$$3 \text{ dib } 5 = 2 \times 3 + 3 \times 5 = 21.$$

When I **dib** 7 with a second number, I get an answer of 50.

What is the second number?

Ans:

3 There are four types of number machines: A , B , C , D .

Device A: Add 5 to the input number;

Device B: Divide the input number by 2;

Device C: Subtract 4 from the input;

Device D: Multiply the input number by 3.

These devices can be connected. If the device A is followed by the device B , it is written as $A - B$. Then input 1, $1 + 5 = 6$, $6 \div 2 = 3$. Thus the output would be 3.

(1) Pip inputs into the connected device $B - D - A - C$, then he gets 100 as the output.

(2) If Bud inputs 3 and gets 4 as the output, which machines have been connected? .

4 A rule for numbers is to add 12 and divide the answer by 2.

For example if you start with 6 you add 12 and get 18 and then you divide by 2 to get 9.

So applying the rule to the number 10 you get the answer 11.

(1) What is the answer if you apply the rule to the number 30?

(2) What is the number if you apply the rule twice starting with the number 20?

(3) If the rule is applied to a number the answer is 15.

What was the starting number?

(4) If the rule is applied twice the answer is 50. What was the starting number?

(5) The rule is applied once to the number N and the answer you get is also N .

What is the number N ?

5 Here is a two stage "Number Machine"

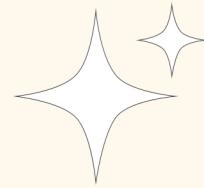


Complete the table below

INPUT	OUTPUT
5	42
8	
100	
	30
	78

Complete this number machine so that it always gives the same output as the number machine above





Lesson 2

Addition and Subtraction Skills (3)



Let's Look Back

Addition and
Subtraction Skills (2)

About this Lesson

Addition and
Subtraction Skills (3)

Let's Look Ahead

Multiplication Skills
(1)

Objectives

- Calculate fast by adding or removing brackets
- Rounding methods in addition and subtraction
- The base number method and grouping method

Let's Get Ready

1 Calculate:

(1) $32 + 27 + 8 =$

(2) $53 + 38 + 7 =$

(3) $37 - 19 - 17 =$

(4) $53 + 16 - 43 =$

2 Calculate

(1) $11 + 17 + 9 - 7 + 12 + 8 =$

(2) $19 + 27 - 9 - 7 + 8 =$

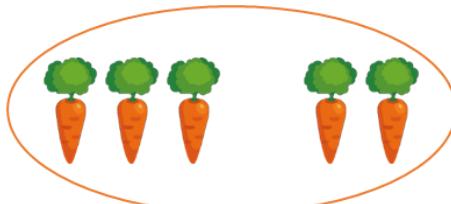
3 Calculate:

$17 + 18 + 19 + 9 =$

In Class

Learn and Discover

Pip has 9 carrots, he eats the carrots in the circle, how many carrots are left? Write the subtraction expression for each of the figures:





Compare the two expressions, what do you find?

-
-
-
-
-
-

Exploration 1

Calculate:

$$(1) 565 - (91 + 165) = \underline{\hspace{2cm}}$$

$$(2) 274 - (174 - 69) = \underline{\hspace{2cm}}$$

$$(3) 229 - (130 - 71) = \underline{\hspace{2cm}}$$

Practice

Calculate:

$$(1) 314 - (77 + 114) = \underline{\hspace{2cm}}$$

$$(2) 542 - (242 - 88) = \underline{\hspace{2cm}}$$

Learn and Discover

Which one is easier to calculate?



$$152 - 76 - 24$$



$$152 - (76+24)$$

-
-
-
-
-
-

Exploration 2

Calculate:

$$(1) 172 - 73 - 27$$

$$(2) 199 - 43 + 33$$

Exploration 3**1 Calculate:**

(1) $236 + 298$

(2) $199 + 497$

(3) $98 + 198 + 298 + 398$

2 Calculate: $502 + 497 + 499 + 501 + 496$

Exploration 4

Calculate:

$$(1) 412 - 197$$

$$(2) 735 - 199 - 398$$

Challenge

Calculate: $100 - 99 + 98 - 97 + 96 - 95 + \dots + 4 - 3 + 2 - 1 = \underline{\hspace{2cm}}$

Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

Calculate:

$$(1) 681 - 123 - 77 . \quad (2) 465 - (165 + 187) .$$



Day 1

1 Which of the following expressions has the same result as $463 - (238 - 37)$?

- A. $463 - 238 - 37$
- B. $463 + 238 - 37$
- C. $463 + 238 + 37$
- D. $463 - 238 + 37$

2 Calculate:

$$(1) 326 - (126 - 89) = \underline{\hspace{2cm}} \quad (2) 257 - (39 + 157) = \underline{\hspace{2cm}}$$

3 Calculate:

$$(1) 363 - (163 - 89)$$

$$(2) 274 - (180 - 126)$$

4 Calculate:

$$(1) 221 - (121 - 59)$$

$$(2) 215 - (138 - 85)$$

5 Calculate:

$$(1) 186 - (86 - 39)$$

$$(2) 153 - (98 - 47)$$



Day 2

1 Which of the following expressions has the same result as $293 - 56 - 44$?

- A. $293 - (56 - 44)$ B. $293 - (56 + 44)$
C. $293 + (56 - 44)$ D. $293 + (56 + 44)$

2 Calculate:

(1) $374 - 17 - 83$. (2) $472 - 394 + 94$.

3 Calculate:

(1) $465 + 76 + 124$. (2) $505 - 284 + 84$.

4 Calculate:

(1) $247 - 128 - 72 = \underline{\hspace{2cm}}$ (2) $381 - 174 + 74 = \underline{\hspace{2cm}}$

5 Calculate:

(1) $278 - 159 - 41$. (2) $247 - 168 + 68$.



Day 3

1 Calculate:

(1) $28 + 95$.

(2) $197 + 87$.

2 Calculate:

(1) $176 + 199$.

(2) $998 + 998$.

3 Calculate:

(1) $355 + 197 = \underline{\hspace{2cm}}$

(2) $198 + 199 + 298 = \underline{\hspace{2cm}}$

4 Calculate:

(1) $297 + 196 + 188$

(2) $98 + 399 + 299$

(3) $699 + 702 + 697$

5 Calculate: $302 + 299 + 298 + 299 + 305 = \underline{\hspace{2cm}}$

**Day 4****1** Calculate:

(1) $653 - 299$.

(2) $526 - 397$.

2 Calculate:

(1) $374 - 198$.

(2) $482 - 197$.

3 Calculate:

(1) $418 - 299 = \underline{\hspace{2cm}}$

(2) $934 - 497 - 201 = \underline{\hspace{2cm}}$

4 Calculate:

(1) $812 - 99 - 399$

(2) $546 - 298 - 197$

(3) $664 - 198 - 203$

5 Calculate :

(1) $761 - 99 - 98 - 97$.

(2) $552 - 87 - 98 - 101$.



Extensive Challenges

1 Calculate:

$$(1) 307 + 201 - 398 - 99 .$$

$$(2) 208 + 494 - 498 - 95 .$$

2 Calculate: $93 + 96 + 97 + 95 + 89 + 90 + 94 + 87 + 95 + 92$

3 Calculate :

$$88 - 87 + 86 - 85 + 84 - 83 + \dots + 4 - 3 + 2 - 1 =$$

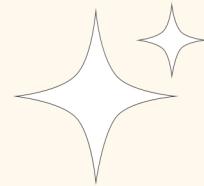
4 Calculate:

$$(1) 38 + 37 - 36 - 35 + 34 + 33 - 32 - 31 + 30 + 29 - 28 - 27 + 26$$

$$(2) 30 - 29 - 28 + 27 + 26 - 25 - 24 + 23 + 22 - 21 - 20 + 19$$

$$(3) 60 + 59 - 58 - 57 + 56 + 55 - 54 - 53 + 52 + 51 - 50 - 49 + \dots + 4 + 3 - 2 - 1$$

5 Calculate: $157 + 257 + 357 + 457 + 557 + 657 + 757$



Lesson 3

Listing Method (2)



Let's Look Back

Listing Method (1)

About this Lesson

Listing Method (2)

Let's Look Ahead

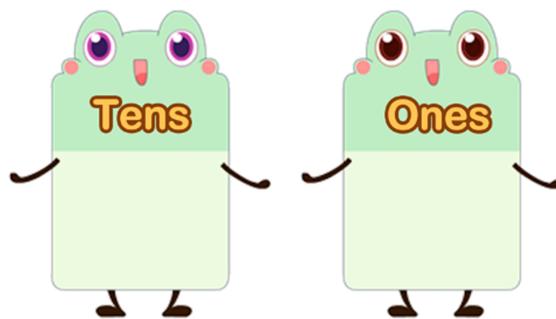
Counting with the Tree Diagram

Objectives

- List all possibilities in alphabetical order
- List all possibilities in number size order
- List in order with conditions

Let's Get Ready

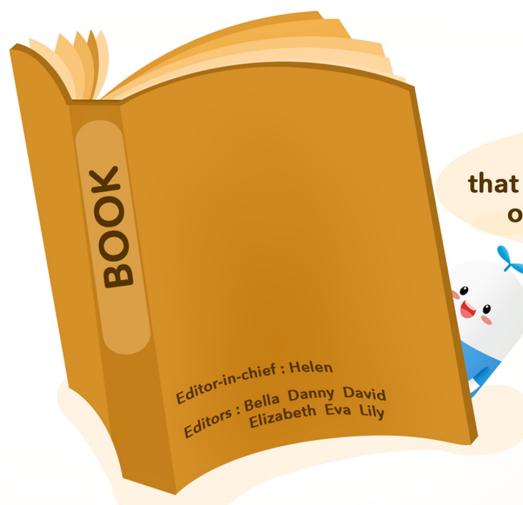
- 1 The code is a two-digit number. The ones digit is 5 more than the tens digit.
How many possible codes are there in total? Please write down all the numbers that meet the requirements.



- 2 How many different two-digit numbers can be formed with the digits 2, 3, and 4 if each digit can only be used once in each number? _____
- 3 How many different two-digit numbers can be formed with the digits 0, 1, 5, and 6 if each digit can only be used once in each number? _____

In Class

Learn and Discover



Have you ever noticed
that there is always a page listing
of all the editors in a book?

Can you find out how they arrange the names of the editors?

Try to arrange the words below in the same way:

Andrea Alina Angus Alicia Andrew



Exploration 1

- 1 Alice, Bob and Emily are lining up to take a picture. How many different ways can they line up?

2 How many different three-digit numbers can be formed with the digits 2, 4, and 6 if each digit can only be used once in each number? _____

3 You can make _____ different three-digit numbers with 0, 2, 4, 6 without using the same number twice.

Practice

Answer the following questions.

(1) How many different three-digit numbers can be formed with the digits 1, 2, and 3 if each digit can only be used once in each number?

(2) How many different three-digit numbers can be formed with the digits 0, 5, and 7 if each digit can only be used once in each number?

Exploration 2

1 How many different three-digit numbers can be formed with the digits 6, 7, and 8 if each digit can be used more than once in each number?

- 2 How many different three-digit numbers can be formed with the digits 0, 2, and 3 if each digit can be used more than once in each number?

Reasoning

Is Pip correct? If not, please correct his answer!

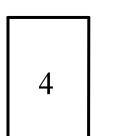
How many different two-digit numbers can you make with 1, 2, 3 and 4 if each digit can be used more than once in each number?

Pip's answer:

There are 12 numbers: 12, 13, 14, 21, 23, 24, 31, 32, 34, 41, 42, 43

Exploration 3

Here are some digit cards:



Write all the three-digit numbers, smaller than 500, that can be made using these cards.

Learn and Discover

Using the digits 1, 2, 3, how many different numbers without using the same number twice can we form?



I had learned this before, and there should be 6 different numbers.

Hi Pip, I know what you said is to form different 3-digit numbers, but you should read the question carefully. This time we need to think how many different natural numbers are.



Uh, so how do we start this question?

(1) One digit number: _____ , _____ , _____

(2) Two-digit number: _____ , _____ , _____ , _____ , _____ , _____

(3) Three-digit number: _____ , _____ , _____ , _____ , _____ , _____

(4) The total is _____ .



Exploration 4

Using the digits 1, 0, and 9, we can form _____ different numbers without repeating digits.

Challenge

The numbers 21, 654, 6521 have one thing in common: these have at least two digits, and the number of the left digit is always larger than the number of the right digit. We call these "descending numbers". With 2, 3, 7, 9, how many "descending numbers" can you make? _____

Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

Answer the following questions.

(1) How many different three-digit numbers can be formed with the digits 3, 5, and 7 without repeating digits?

(2) How many different three-digit numbers can be formed with the digits 3, 0, and 2 without repeating numbers?



Day 1

1 Ben, Carol and Dasu are seated in a row of three chairs. How many different ways do they sit in the chairs? _____

- 2 Using the digits 0, 2, and 3, we can form _____ different numbers without repeating digits.
- 3 Using the digits 1, 3, and 9, we can form _____ different numbers without repeating digits.
- 4 How many different two-digit numbers can be formed with the digits 0, 3, 5, and 9 if each digit can only be used once in each number? _____
- 5 Write down all the three-digit numbers with 4, 6, 9 without using the same number twice.



Day 2

1 Answer the following questions.

(1) How many different three-digit numbers can be formed with the digits 2, 4, and 9 if each digit can only be used once in each number?

(2) How many different three-digit numbers can be formed with the digits 2, 0, and 6 if each digit can only be used once in each number?

2 Without using numbers twice, you can make _____ different two-digit numbers with 1, 3, 4 and 7.

3 Write down all the three-digit numbers with 0, 1, 3, 5 without using the same number twice.

- 4 Write down all the three-digit numbers with 2, 4, 7, 9 without using the same number twice.

- 5 Write down all the different three-digit numbers with the digits 5, 0, and 8 if each digit can be used more than once in each number.



Day 3

- 1 Here are some digit cards:

6	1	8	3
---	---	---	---

How many three-digit numbers, smaller than 300, that can be made using these cards? _____

- 2 Here are some digit cards:

4	6	4	9
---	---	---	---

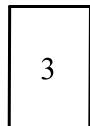
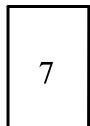
How many three-digit numbers, smaller than 600, that can be made using these cards? _____

- 3 Here are some digit cards:

1	2	5	5
---	---	---	---

Write all the three-digit numbers, smaller than 500, that can be made using these cards.

4 Here are some digit cards:



Write all the three-digit numbers, bigger than 700, that can be made using these cards.

5 Here are some digit cards:



Write all the three-digit numbers, larger than 600, that can be made using these cards.



Day 4

- 1 Write down all the different three-digit numbers with the digits 0, 3, and 9 if each digit can be used more than once in each number.
 - 2 Write down all the different three-digit numbers with the digits 2, 3, and 9 if each digit can be used more than once in each number.
 - 3 Using the digits 2, 0, and 8, we can form _____ different numbers without repeating digits.

- 4 Using the digits 4, 5, and 8, we can form _____ different numbers without repeating digits.

- 5 An ice cream kiosk sells cones with two scoops of ice cream.

It offers a choice of six different flavours each day.

The scoops may be the same flavour or different flavours.

How many different choices of ice cream cone does the kiosk offer each day? ()

FLAVOURS

Choice of the day

-
- 1. Vanilla
 - 2. Chocolate
 - 3. Strawberry
 - 4. Mint
 - 5. Peach
 - 6. Tutti Frutti

A. 21

B. 30

C. 18

D. 36

E. 15



Extensive Challenges

- 1 Jeremy has 4 cards with the digits 8, 4, 5 and 8 written on them as below:

8 4 5 8

How many different numbers can Jeremy make using all of the cards? _____

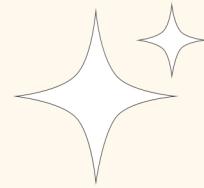
- 2 Baby is two years old now and drinks milk by the quarter pint, so we have decided to call her *GILL*. Getting her to recognise her name proved difficult, so we put the letters *G, I, L, L* on separate building blocks. She loves arranging them, but rarely gets them in the right order. One day she managed to produce every possible four-letter 'word': *LILG* is one such. How many different four-letter words did she produce that day?
- 3 The numbers 21, 654, 6521 have one thing in common: these have at least two digits, and the number of the left digit is always larger than the number of the right digit. We call these "descending numbers". With 1, 2, 6, 7, how many three-digit "descending numbers" can you make? _____

- 4 The numbers 12, 456, 1256 have one thing in common: these have at least two digits, and the number on the digit on the left is always smaller than the digit on the right. We call them "ascending numbers". With 0, 2, 4, 6, 8, how many "ascending numbers" can you make? _____

- 5 There are 24 four-digit numbers which use each of the digits 3, 5, 6 and 9 once only.

When all of these 24 four-digit numbers are put in order from smallest to largest, which one is in the eighth position? ()

- A. 3569 B. 5369 C. 5396 D. 5639 E. 5936



Lesson 4

Short Division



Let's Look Back

Division with
Remainder

About this Lesson

Short Division

Let's Look Ahead

Long Division

Objectives

- Divide a 2-digit number by a 1-digit number
- Divide a 3-digit number by a 1-digit number
- Division with remainder

Let's Get Ready

1 Multiply 57 by 8. _____

2 Match.

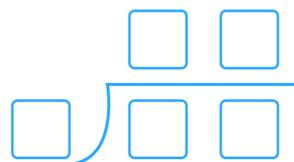
- | | |
|----------------|----------------|
| 1. $54 \div 9$ | A. $21 \div 3$ |
| 2. $24 \div 8$ | B. $64 \div 8$ |
| 3. $49 \div 7$ | C. $24 \div 4$ |
| 4. $72 \div 9$ | D. $18 \div 6$ |

3 There are 20 balloons and Candy wants to distribute them equally to 2 students. How many balloons will each of the students receive?

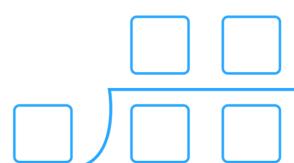
In Class

Learn and Discover

- 1 Pip wants to share £63 to Alice, Bud and Colin equally. Can you help him?



- 2 Bud wants to share £42 to Eddie, Fiona and Grace equally. Can you help her?



• • • •

Exploration 1

Use short division to solve the following division equations.

(1) $64 \div 2 =$

(2) $96 \div 4 =$

(3) $54 \div 3 =$

Practice

(1) $72 \div 6 =$

(2) $87 \div 3 =$

Learn and Discover

452 sweets are going to be divided evenly among Pip, Bud, Eddie and Helen. How would you divide these sweets evenly among them?



Handwriting practice lines for the answer.

Exploration 2

Calculate:

(1) $465 \div 3 =$

(2) $416 \div 4 =$

(3) $248 \div 8 =$

(4) $405 \div 9 =$

Practice

Use short division to calculate:

(1) $708 \div 6 =$ _____

(2) $532 \div 7 =$ _____

Exploration 3

Calculate:

$$(1) 86 \div 6 =$$

$$(2) 93 \div 4 =$$

$$(3) 346 \div 7 =$$

$$(4) 611 \div 9 =$$

Practice

Calculate:

$$(1) 78 \div 5 =$$

$$(2) 572 \div 8 =$$

Exploration 4

- 1 Farmer Andrew's chickens lay a total of 735 eggs. Each egg box holds only 6 eggs. How many egg boxes will Farmer Andrew be able to completely fill with these eggs? _____

- 2 A fruiterer bought 500 oranges. He packed the oranges into boxes. Each box contained 8 oranges. How many boxes would he need in order to contain all the oranges? _____

Challenge

A transport company's vans each carry a maximum load of 9 tonnes. A firm needs to deliver 120 crates each weighing 4 tonnes. How many vans are needed?

Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

Calculate:

$$(1) 82 \div 7 =$$

$$(2) 413 \div 6 =$$

$$7 \overline{)8 \quad 2}$$

$$6 \overline{)4 \quad 1 \quad 3}$$



Day 1

1 Use short division to calculate the following.

$$(1) 58 \div 2 = \underline{\hspace{2cm}}$$

$$(2) 78 \div 6 = \underline{\hspace{2cm}}$$

$$(3) 99 \div 9 = \underline{\hspace{2cm}}$$

2 Use short division to calculate the following.

(1) $91 \div 7 = \underline{\hspace{2cm}}$

(2) $85 \div 5 = \underline{\hspace{2cm}}$

(3) $74 \div 2 = \underline{\hspace{2cm}}$

3 Use short division to calculate the following.

(1) $75 \div 5 = \underline{\hspace{2cm}}$

(2) $92 \div 4 = \underline{\hspace{2cm}}$

(3) $87 \div 3 = \underline{\hspace{2cm}}$

4 Solve the following with short division.

(1) $45 \div 3 = \underline{\hspace{2cm}}$

(2) $84 \div 6 = \underline{\hspace{2cm}}$

(3) $97 \div 7 = \underline{\hspace{2cm}} \text{ r } \underline{\hspace{2cm}}$

5 Here is a set of numbers: 28, 36, 31, 39, 33, 37.

(1) Which of these can be divided exactly by 3 and 4? _____

(2) Which of these has a remainder of 4 when divided by 6? _____

(3) Which of these has a remainder of 3 when divided by 9? _____

(4) Which of these has a remainder of 2 when divided by 7? _____

(5) Which of these has a remainder of 1 when divided by 8? _____



Day 2

- 1 How many expressions following have two-digit quotients?

$$750 \div 7 \quad 75 \div 7 \quad 750 \div 8 \quad 705 \div 7$$

A. 2

B. 3

C. 1

D. 4

- 2 Use short division to calculate the following.

$$(1) 63 \div 3 = \underline{\hspace{2cm}}$$

$$(2) 262 \div 2 = \underline{\hspace{2cm}}$$

$$(3) 844 \div 4 = \underline{\hspace{2cm}}$$

- 3 Use short division to calculate the following.

$$(1) 840 \div 5 = \underline{\hspace{2cm}}$$

$$(2) 243 \div 9 = \underline{\hspace{2cm}}$$

$$(3) 368 \div 8 = \underline{\hspace{2cm}}$$

4 Do these divisions.

(1) $7 \overline{)896}$

(2) $6 \overline{)786}$

(3) $4 \overline{)516}$

5 Calculate:

(1) $273 \div 7 = \underline{\quad}$

(2) $325 \div 5 = \underline{\quad}$

(3) $752 \div 9 = \underline{\quad} \text{ r } \underline{\quad}$



Day 3

1 Use short division to calculate the following. Show your working.

$$(1) 97 \div 4 = \underline{\quad} \text{ r } \underline{\quad}$$

$$(2) 387 \div 6 = \underline{\quad} \text{ r } \underline{\quad}$$

$$(3) 473 \div 4 = \underline{\quad} \text{ r } \underline{\quad}$$

2 Calculate:

$$(1) 123 \div 7 = \underline{\quad} \text{ r } \underline{\quad}$$

$$(2) 357 \div 9 = \underline{\quad} \text{ r } \underline{\quad}$$

$$(3) 564 \div 5 = \underline{\quad} \text{ r } \underline{\quad}$$

3 Calculate:

$$(1) 415 \div 2 = \underline{\quad} \text{ r } \underline{\quad}$$

$$(2) 257 \div 9 = \underline{\quad} \text{ r } \underline{\quad}$$

$$(3) 520 \div 3 = \underline{\quad} \text{ r } \underline{\quad}$$

4 Calculate:

(1) $666 \div 8 = \underline{\quad} \text{ r } \underline{\quad}$.

(2) $555 \div 7 = \underline{\quad} \text{ r } \underline{\quad}$.

5 I divided 123 by 4 and got the quotient and the remainder. This quotient divided by this remainder equals ().

A. 5

B. 10

C. 15

D. 23



Day 4

- 1 Five children take part in a relay charity walk. Each child walks for the same amount of time. In total they walk for one hour.

For how many minutes does each child walk? _____ minutes

- 2 A book has 185 pages and Mike plans to read 5 pages per day. It will take _____ days to read the book.

- 3 Mike bought 350 apples. He packed the apples into boxes. Each box contained 6 apples. How many boxes would he need in order to contain all the apples? _____

4 There are 960 kilograms avocados. If each box can hold 8 kilograms avocados, how many boxes can we hold in total?

5 If 4 comics cost £3.00, what is the cost of one? _____ p



Extensive Challenges

- 1 The Think Elementary School launched the crayon painting exhibition activity for students. There are a total of 348 pictures. If the teacher wants to display 5 lines. How many paintings are displayed in each line, and how many are left?

- 2 A party of 94 people go on a day trip to a local castle.
They travel by minibus.
Each minibus holds 8 people
(1) How many minibuses are needed for the trip?
(2) How many spare seats are there?

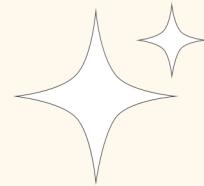
- 3 A bakery made 240 biscuits. They wanted the biscuits to be packed nicely into boxes. If each box can contain at most 7 biscuits, how many boxes does the bakery need such that all the biscuits can be packed into a box?

4 A transport company's vans each carry a maximum load of 9 tonnes. A firm needs to deliver 345 crates each weighing 2 tonnes. How many vans are needed?

5 A fruiterer bought 260 oranges. He bought 175 more apples than oranges and 50 fewer pears than oranges.

(1) How many fruits did he buy in all? _____

(2) He packed the fruit into boxes. Each box contained 8 of the same kind of fruit. Fruit should not be mixed, e.g. apples should not be packed in the same box as oranges. How many full boxes did he get? _____



Lesson 5

Understanding Fractions (6)



Let's Look Back

Fractions

About this Lesson

Understanding
Fractions

Let's Look Ahead

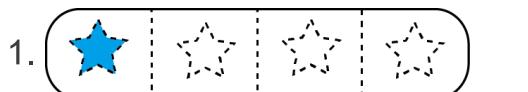
Addition and
Subtraction of
Fractions

Objectives

- Conversions between fractions and mixed numbers
- Finding equivalent fractions
- Compare fractions
- Addition and subtraction of fractions

Let's Get Ready

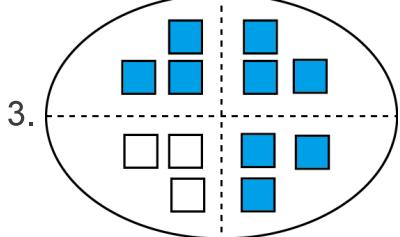
- 1** Match the picture with the fraction.



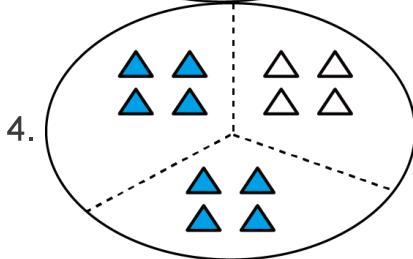
A. $\frac{3}{4}$



B. $\frac{2}{3}$

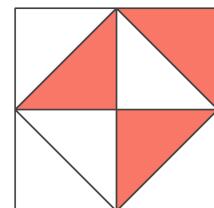


C. $\frac{3}{5}$

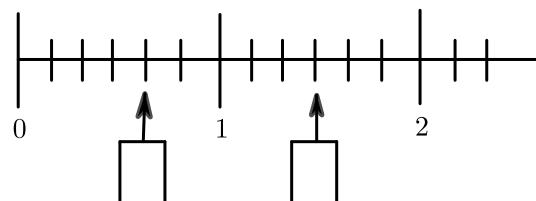


D. $\frac{1}{4}$

- 2** How many more pieces do we have to colour to represent $\frac{7}{8}$? _____



- 3** Look at the number line below. Write the fraction or mixed number in the boxes provided.



In Class

Learn and Discover

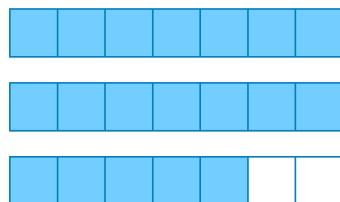
- 1 Bud converts the mixed number $3\frac{4}{5}$ into an improper fraction.

$$\left. \begin{array}{|c|c|c|c|c|} \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline \end{array} \right\} 1 = \frac{5}{5}$$

$$\left. \begin{array}{|c|c|c|c|c|} \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} & \textcolor{blue}{\boxed{}} \\ \hline \end{array} \right\} 3 = \frac{3 \times 5}{5}$$

$$3\frac{4}{5} = \frac{3 \times 5 + 4}{5} = \frac{19}{5}$$

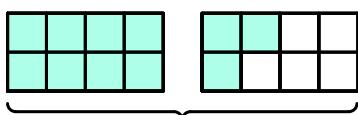
Convert the mixed number $2\frac{5}{7}$ into an improper fraction.



$$2\frac{5}{7} = \underline{\hspace{2cm}}.$$

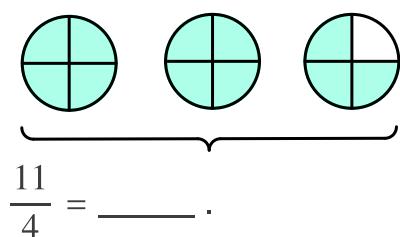
-
-
-
-
-
-
-

- 2 Pip converts the improper fraction $\frac{11}{8}$ into a mixed number.



$$\frac{11}{8} = 1 + \frac{3}{8} = 1\frac{3}{8}.$$

Convert the improper fraction $\frac{11}{4}$ into a mixed number.



$$\frac{11}{4} = \underline{\quad}.$$

-
-
-
-
-
-

Exploration 1

Fill in the blanks.

- (1) Convert each improper fraction below into a mixed number.

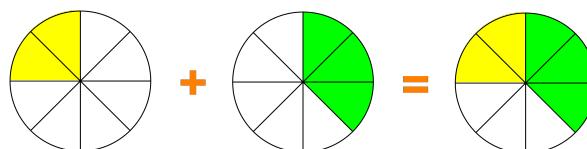
$$\frac{37}{5} = \underline{\quad}. \qquad \frac{45}{7} = \underline{\quad}.$$

- (2) Convert each mixed number below into an improper fraction.

$$4\frac{7}{10} = \underline{\quad}. \qquad 5\frac{1}{4} = \underline{\quad}.$$

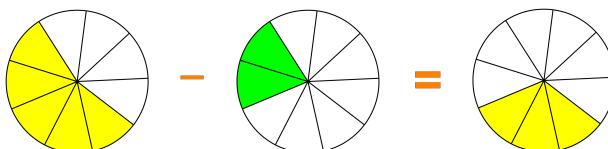
Learn and Discover

1



$$\frac{2}{8} + \frac{3}{8} = \frac{(\quad)}{(\quad)}$$

2



$$\frac{5}{9} - \frac{2}{9} = \frac{(\quad)}{(\quad)}$$

-
-
-
-
-
-

Exploration 2**Calculate:**

$$(1) \frac{5}{12} + \frac{6}{12} =$$

$$(2) \frac{4}{15} + \frac{2}{15} =$$

$$(3) \frac{7}{11} - \frac{2}{11} =$$

$$(4) \frac{5}{27} + \frac{8}{27} - \frac{4}{27} =$$

Practice**Calculate :**

$$(1) \frac{2}{9} + \frac{4}{9} = \underline{\quad} .$$

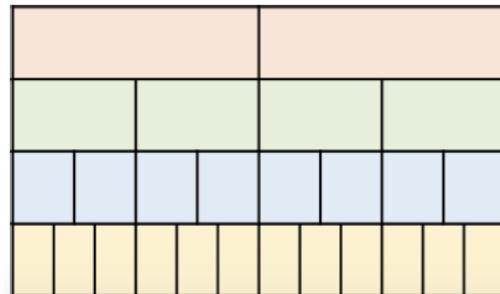
$$(2) \frac{15}{16} - \frac{5}{16} - \frac{3}{16} = \underline{\quad} .$$

Learn and Discover

Use the fraction wall to complete the equivalent fractions.

$$\frac{1}{2} = \frac{(\quad)}{4} = \frac{(\quad)}{8} = \frac{6}{(\quad)}$$

$$\frac{1}{4} = \frac{2}{(\quad)} = \frac{3}{(\quad)}$$



Exploration 3

Fill in the blanks.

$$(1) \frac{2}{5} = \frac{2 \times (\quad)}{5 \times (\quad)} = \frac{(\quad)}{20} \qquad \frac{2}{5} = \frac{(\quad)}{25}$$

$$(2) \frac{18}{24} = \frac{18 \div (\quad)}{24 \div (\quad)} = \frac{(\quad)}{12} \qquad \frac{18}{24} = \frac{6}{(\quad)}$$

$$(3) \frac{6}{15} = \frac{(\quad)}{20}$$

Practice

Fill in the blanks.

$$\frac{6}{20} = \frac{(\quad)}{10} = \frac{18}{(\quad)}$$

Reasoning

Is Pip correct? If not, please correct his answer!

Fill in the blank: $\frac{6}{8} = \frac{(\quad)}{12}$

Pip's answer:

$$\frac{6}{8} = \frac{6+4}{8+4} = \frac{10}{12}$$

Learn and Discover

- 1** Fill in the circles with the correct sign $>$, $<$ or $=$.

$$\frac{1}{4} \bigcirc \frac{2}{4} \qquad \frac{2}{11} \bigcirc \frac{3}{11} \qquad \frac{81}{100} \bigcirc \frac{28}{100}$$

$$\frac{1}{2} \bigcirc \frac{1}{3} \qquad \frac{3}{7} \bigcirc \frac{3}{4} \qquad \frac{2}{100} \bigcirc \frac{2}{99}$$

- 2** Compare: $\frac{7}{12} \bigcirc \frac{3}{4}$

Step 1: $\frac{3}{4} = \frac{(\quad)}{12}$

Step 2: Compare the two fractions with the same denominators: $\frac{7}{12} \bigcirc \frac{(\quad)}{12}$

Step 3: Give your answer: $\frac{7}{12} \bigcirc \frac{3}{4}$

- 3** Compare $\frac{6}{11} \bigcirc \frac{3}{4}$

Step 1: $\frac{3}{4} = \frac{6}{(\quad)}$

Step 2: Compare the two fractions with the same numerators: $\frac{6}{11} \bigcirc \frac{6}{(\quad)}$

Step 3: Give your answer: $\frac{6}{11} \bigcirc \frac{3}{4}$

Exploration 4

Fill in the circles with the correct sign $>$, $<$ or $=$.

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

$\frac{3}{10} \bigcirc \frac{17}{20}$

$\frac{2}{7} \bigcirc \frac{8}{21}$

Challenge

$\frac{1}{8} + \frac{5}{24} =$

$\frac{5}{11} - \frac{7}{44} =$

Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

Find the equivalent fractions.

$$\frac{4}{5} = \frac{(\quad)}{15}$$

$$\frac{12}{25} = \frac{(\quad)}{100}$$

$$\frac{(\quad)}{10} = \frac{6}{20} = \frac{(\quad)}{80}$$



Day 1

- 1 Write each improper fraction below as a mixed number.

(a) $\frac{51}{8} = \underline{\quad}$.

(b) $\frac{55}{6} = \underline{\quad}$.

(c) $\frac{77}{3} = \underline{\quad}$.

2 Write each mixed number below as an improper fraction.

$$\textcircled{1} 4\frac{1}{2} = \underline{\hspace{2cm}}$$

$$\textcircled{2} 2\frac{2}{5} = \underline{\hspace{2cm}}$$

$$\textcircled{3} 1\frac{7}{11} = \underline{\hspace{2cm}}$$

3 Draw lines to connect the numbers which equal the same amount in the two rows.

$$\frac{36}{4}$$

$$\frac{23}{11}$$

$$3$$

$$\frac{30}{7}$$

$$3\frac{2}{7}$$

$$4\frac{2}{7}$$

$$\frac{18}{6}$$

$$9$$

$$2\frac{1}{11}$$

$$\frac{23}{7}$$

4 Fill in the blanks.

(1) Convert each improper fraction below into a mixed number.

$$\frac{41}{6} = \underline{\hspace{2cm}}$$

$$\frac{29}{9} = \underline{\hspace{2cm}}$$

(2) Convert each mixed number below into an improper fraction.

$$3\frac{2}{5} = \underline{\hspace{2cm}}$$

$$5\frac{3}{11} = \underline{\hspace{2cm}}$$

5 Compare the following fractions. Add $>$ or $<$ to show which is the bigger fraction of the pair.

$$\frac{7}{9} \bigcirc 1\frac{2}{9} \quad 4\frac{2}{7} \bigcirc \frac{31}{7} \quad \frac{49}{12} \bigcirc 4 \quad \frac{37}{6} \bigcirc 5\frac{5}{6}$$

**Day 2****1 Fill in the blanks!**

(1) $\frac{2}{5} = \frac{2 \times (\quad)}{5 \times 6} = \frac{(\quad)}{(\quad)}$

(2) $\frac{14}{18} = \frac{14 \div 2}{18 \div (\quad)} = \frac{(\quad)}{(\quad)}$

(3) $\frac{8}{15} = \frac{8 \times (\quad)}{15 \times (\quad)} = \frac{24}{(\quad)}$

(4) $\frac{2}{7} = \frac{20}{(\quad)}$

2 Fill in the blanks!

(1) $\frac{2}{3} = \frac{2 \times (\quad)}{3 \times 6} = \frac{(\quad)}{(\quad)}$

(2) $\frac{12}{14} = \frac{12 \div 2}{14 \div (\quad)} = \frac{6}{(\quad)}$

(3) $\frac{8}{16} = \frac{8 \times (\quad)}{16 \times (\quad)} = \frac{24}{(\quad)}$

(4) $\frac{3}{4} = \frac{30}{(\quad)}$

(5) $\frac{21}{24} = \frac{(\quad)}{8}$

(6) $\frac{16}{18} = \frac{8}{(\quad)}$

3 Fill in the blanks with the appropriate numbers.

$$(1) \frac{6}{11} = \frac{30}{(\quad)}$$

- A. 35 B. 40 C. 45 D. 55

$$(2) \frac{8}{7} = \frac{(\quad)}{28}$$

- A. 32 B. 29 C. 27 D. 22

$$(3) \frac{16}{20} = \frac{(\quad)}{5}$$

- A. 1 B. 2 C. 3 D. 4

4 Find the missing number : $\frac{20}{32} = \frac{?}{24} (\quad)$.

- A. 15 B. 16 C. 17 D. 18

$$(5) \frac{6}{15} = \frac{\square}{35}$$

What is the missing number in the box? ()

- A. 7 B. 2 C. 14 D. 26



Day 3

1 Compare fractions and fill in the blanks with > or <.

$$(1) \frac{11}{15} \bigcirc \frac{14}{15}$$

$$(3) \frac{3}{8} \bigcirc \frac{3}{10}$$

$$(2) \frac{7}{9} \bigcirc \frac{5}{9}$$

$$(4) \frac{7}{12} \bigcirc \frac{7}{11}$$

2 Compare: $\frac{3}{8} \bigcirc \frac{17}{40}; \frac{4}{5} \bigcirc \frac{12}{13}$

A. >, >

B. >, <

C. <, >

D. <, <

E. <, =

3 Compare the following fractions. Add > or < to show which is the bigger fraction of the pair.

$$2\frac{6}{7} \bigcirc \frac{22}{7} \quad \frac{4}{5} \bigcirc \frac{7}{10} \quad \frac{9}{22} \bigcirc \frac{4}{11} \quad 2\frac{14}{15} \bigcirc 2\frac{4}{5}$$

4 Which one of the following fractions is larger than $\frac{1}{3}$? ()

- A. $\frac{7}{21}$ B. $\frac{6}{17}$ C. $\frac{4}{13}$ D. $\frac{3}{11}$

5 Arrange the following fractions from the biggest to the smallest. ()

$$\frac{1}{4}, \frac{5}{6}, \frac{7}{12}$$

- A. $\frac{1}{4}, \frac{7}{12}, \frac{5}{6}$ B. $\frac{5}{6}, \frac{7}{12}, \frac{1}{4}$ C. $\frac{7}{12}, \frac{5}{6}, \frac{1}{4}$ D. $\frac{7}{12}, \frac{1}{4}, \frac{5}{6}$



Day 4

1 Find the results of the following equations:

$$\frac{7}{15} - \frac{4}{15} = \underline{\hspace{2cm}} ; \frac{5}{12} + \frac{1}{12} = \underline{\hspace{2cm}} . (\quad)$$

- A. $\frac{1}{5}, \frac{6}{12}$ B. $\frac{3}{15}, \frac{4}{12}$ C. $\frac{1}{5}, \frac{2}{6}$ D. $\frac{11}{15}, \frac{6}{12}$ E. $\frac{1}{3}, \frac{1}{2}$

2 Calculate:

$$(1) \frac{3}{7} + \frac{2}{7} = (\quad) .$$

- A. $\frac{5}{14}$ B. $\frac{6}{14}$ C. $\frac{6}{7}$ D. $\frac{5}{7}$

$$(2) \frac{7}{25} + \frac{8}{25} = (\quad) .$$

- A. $\frac{16}{50}$ B. $\frac{3}{5}$ C. $\frac{16}{25}$ D. $\frac{15}{50}$

$$(3) \frac{31}{32} - \frac{15}{32} = (\quad) .$$

- A. $\frac{46}{32}$ B. $\frac{23}{16}$ C. $\frac{1}{2}$ D. $\frac{1}{4}$

$$(4) \frac{7}{12} - \frac{5}{12} = (\quad) .$$

- A. 1 B. $\frac{1}{12}$ C. $\frac{1}{2}$ D. $\frac{1}{6}$

3 Calculate:

$$(1) \frac{3}{10} + \frac{4}{10} = \underline{\hspace{2cm}} .$$

$$(2) \frac{1}{8} + \frac{3}{8} = \underline{\hspace{2cm}} .$$

(3) $\frac{6}{7} - \frac{1}{7} = \underline{\hspace{2cm}}$.

(4) $\frac{57}{100} - \frac{16}{100} = \underline{\hspace{2cm}}$.

4 Calculate:

$\frac{2}{15} + \frac{8}{15} = \underline{\hspace{2cm}}$

$\frac{5}{9} + \frac{7}{9} = \underline{\hspace{2cm}}$

$\frac{19}{50} + \frac{23}{50} + \frac{33}{50} = \underline{\hspace{2cm}}$

$\frac{7}{8} - \frac{5}{8} = \underline{\hspace{2cm}}$

$\frac{9}{16} - \frac{2}{16} = \underline{\hspace{2cm}}$

$\frac{43}{36} - \frac{3}{36} - \frac{13}{36} = \underline{\hspace{2cm}}$

5 Calculate:

(1) $\frac{1}{12} + \frac{4}{12} + \frac{6}{12} = \underline{\hspace{2cm}}$.

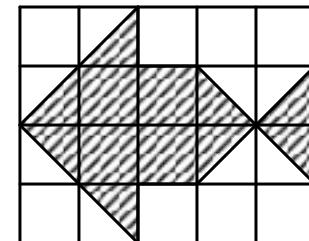
(2) $\frac{8}{17} + \frac{2}{17} - \frac{6}{17} = \underline{\hspace{2cm}}$.

(3) $\frac{15}{19} - \frac{2}{19} - \frac{10}{19} = \underline{\hspace{2cm}}$.



Extensive Challenges

- 4 The figure below is made up of unit squares.

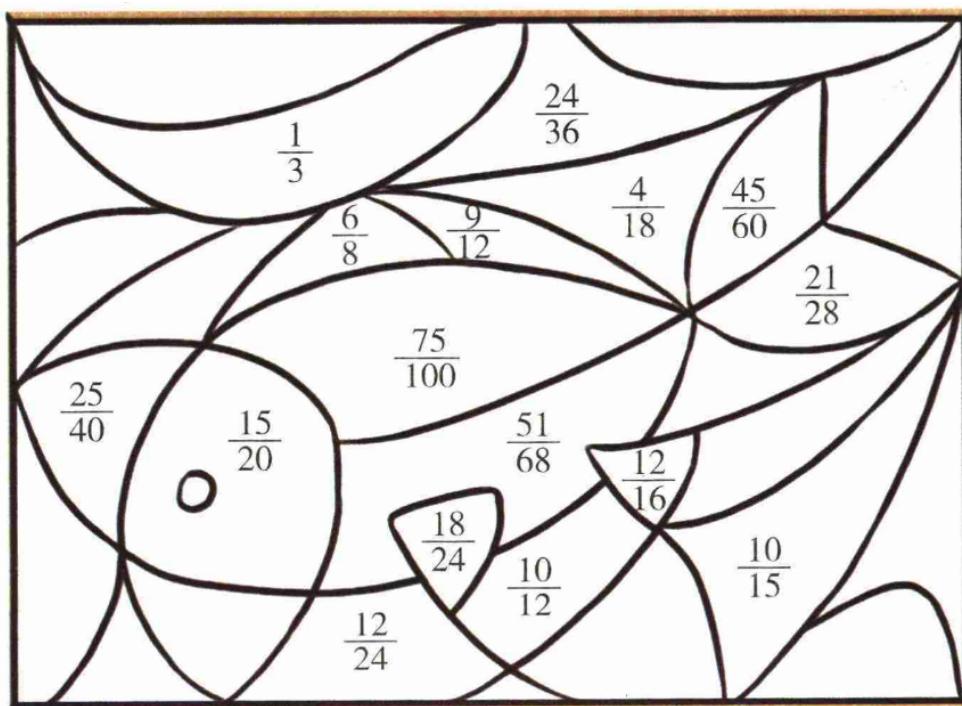


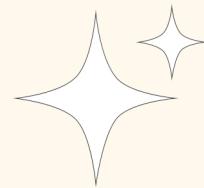
What fraction of the whole figure is unshaded? ()

- A. $\frac{1}{5}$ B. $\frac{2}{5}$ C. $\frac{3}{5}$ D. $\frac{4}{5}$

- 5 Colour in the parts of the fractions equal to $\frac{3}{4}$.

(You can paint in any colour different from the original!)





Lesson 6

Time Problems (4)



Let's Look Back

Time Problems (3)

About this Lesson

Time Problems (4)

Let's Look Ahead

Time Problems (5)

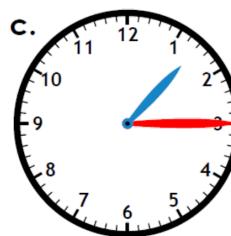
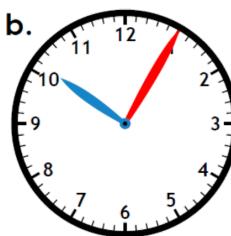
Objectives

- Review of time conversions between the 12-hour and 24-hour systems
- Conversions between hours and minutes
- Solve complex time point and time interval problems



Let's Get Ready

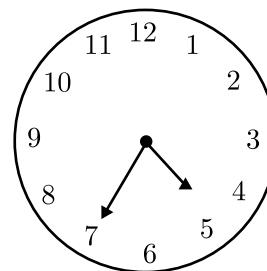
1 Write the time shown:



2 How would these times appear on a 24-hour clock?

- (1) Five past 6 in the morning. _____ .
- (2) 12 : 15 a.m. _____ .
- (3) 7 : 30 p.m. _____ .
- (4) One minute to midnight. _____ .

3 One afternoon, Eadie looks at the clock.



- (1) Write the time in 12 hour clock
- (2) Write the time in 24 hour clock
- (3) Eadie's favourite television programme started 15 minutes ago. What time was this?
- (4) Eadie has to catch a train at 17 : 00. How long does she have before the train leaves?

In Class

Learn and Discover

Complete the table

Time in Hours	Time in Minutes
5 hours 45 minutes	
3 and a half hours	
	155 minutes
	252 minutes

• _____

• _____

• _____

• _____

• _____

Exploration 1

The time taken to complete a project by Janice, Siti, Peter and Ravi is shown below.



Fill in the blanks.

- (1) Who took the shortest time to complete the project? _____ .
- (2) Who took the longest time to complete the project? _____ .
- (3) Arrange the given durations from the shortest to the longest.
_____ , _____ , _____ , _____ .

Learn and Discover

- 1 It's 13:20. What time is it in 3 hours and 25 minutes?



It's faster to use the column method.

$$\begin{array}{r}
 13 : 20 \\
 + 3 : 25 \\
 \hline
 \end{array}$$



- 2 It's 13:20. What time is it in 5 hours and 50 minutes?

$$\begin{array}{r}
 13 : 20 \\
 + 5 : 50 \\
 \hline
 \end{array}$$



Exploration 2

- 1 It takes a train 7 hours and 30 minutes to travel from Aberdeen to London. If the train left Aberdeen at 8 : 55 am, at what time did it arrive at London?
- 2 A TV show started at 4 : 45 p.m. It lasted for 150 minutes. When did the show finish? _____ p.m.

Learn and Discover

1 What time is 2 hours and 15 minutes before 13:20?

$$\begin{array}{r} 13:20 \\ - 2:15 \\ \hline \end{array}$$



2 What time is 2 hours and 45 minutes before 13:20?

$$\begin{array}{r} 13:20 \\ - 2:45 \\ \hline \end{array}$$



Exploration 3

The train, which was 100 minutes late, arrived at 18 : 12.

When should it have arrived? _____

Practice

A match lasted 2 hours and 42 minutes and ended at 16 : 27.

(1) What time did the match start? _____

(2) The players had a break 1 hour and 15 minutes before the end of the game.

What was the time? _____

Learn and Discover

How many minutes are there between 6.10 p.m. and 10.35 p.m.?

$$\begin{array}{r} 10:35 \\ - \quad 6:10 \\ \hline \end{array}$$

**Exploration 4**

A train leaves Warwick station at 11 : 27 am and arrives in London at 1 : 45 pm.

How long did the journey take?

Practice

Gayle left home at 7 : 15 a.m. and arrived at the cinema at 10 minutes to 10.
How long did she take? _____ minutes.

Challenge

(1) Miya went to bed at 22 : 15 yesterday and woke up this morning at 07 : 10. How long did Miya sleep? Give your answer in hours and minutes.

_____ hours and _____ minutes

(2) She needs to catch a flight early tomorrow morning. She needs to get out of bed at 03 : 15 am, but wants to make sure that she has at least 7 and a half hours of sleep. What is the latest time that Miya should go to sleep this evening?

_____ p.m.

Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

Complete the table

Time in Hours	Time in Minutes
2 hours 15 minutes	
20 minutes less than 2 hours	
	95 minutes
	150 minutes



Day 1

- 1 How many minutes are there in three and a half hours? ()
- A. 4 B. 60 C. 210 D. 180 E. 3600

- 2 Mr Peters went to the theatre to see 'The Mousetrap'. If the play is 2 hours and 15 minutes long and finished at 9:33 pm, at what time did the play start?
- 3 Bud puts a turkey in the oven at 10:08 am. It needs 1 hour and 45 minutes to cook. At what time will it be cooked?
- 4 A train leaves London at 15.45. The journey to Leeds takes 3 hours and 29 minutes. What time does it arrive in Leeds?
- 5 A film on TV lasts 2 hours and 28 minutes, and finishes at 11.18 p. m. At what time does it start? ()
A. 8.10 p. m. B. 8.50 p. m. C. 9.10 p. m. D. 9.50 p. m. E. 1.46 p. m.



Day 2

- 1 Mary's violin class started at 11.15 a.m. It lasted for 90 minutes.
What time did her violin class end?
A. 12.05 a. m. B. 12.05 p. m. C. 12.45 a. m. D. 12.45 p. m.
- 2 Ed ran a marathon in 138 minutes. He started running at 10 : 10 am. At what time did he finish the marathon?
- 3 It takes Mr Black exactly 85 minutes to walk to the football stadium from his house. If the football match starts at 7.15 pm, what is the latest time he can leave home?

4 Ali took a train from London to Newcastle at 10 : 53 pm. The journey took 285 minutes. What time did he reach Newcastle? _____ : _____

5 William spent 110 minutes revising Mathematics and 85 minutes revising Science. He finished revising his work at 5:45 pm. What time did he start his revision?



Day 3

- 1 Afternoon school begins at 1 : 30 pm and finishes at 3 : 35 pm.

For how long do we work in the afternoon? _____ h _____ min

- 2 The opening hours of a restaurant are shown below.

How long is the restaurant open each day during the weekend?

Opening hours
Monday to Friday
11 : 00 – 14 : 00
18 : 00 – 21 : 30
Saturday and Sunday
11 : 00 – 14 : 30
17 : 45 – 22 : 00

A. 3h30 min

B. 6h30 min

C. 7h45 min

D. 9h45 min

- 3 The train left Bigville at 2 : 35 p.m. and got to Smalltown at 5 : 25 p.m. How long did the journey take? _____ h _____ min

4 How many minutes are there from 11 : 11 until 23 : 23 on the same day?

_____ minutes

5 My train left Southampton at 7:48 and arrived in Birmingham at 10:20 later that morning. How long in minutes did the journey take?

_____ minutes



Day 4

- 1 The train going to Hogwarts left platform nine and three-quarters at 11:39 am. The journey took two hundred and sixty-two minutes. At what time did the train arrive? _____ : _____ pm
- 2 Rocky and Apollo were the first two babies born at a Hospital this year. Rocky was first born, and 162 minutes later Apollo was born at 1 : 35 pm. At what time was Rocky born? _____ : _____ am
- 3 Dave walked 35 miles on the moor. He started at 9 : 45am and finished at 5 : 29 pm. How long did the walk take overall?
_____ hrs _____ mins

4 A train leaves at 11 : 55 p.m. On Friday and arrives at 4 : 37 a.m.
on Saturday. How long does the journey take? _____ hrs _____ mins

5 Alex arrives at school at 8.30 a.m. and leaves at 4.15 p.m.
For how many minutes is he at school? ()
A. 405 B. 465 C. 495 D. 525 E. 775



Extensive Exercises

- 1 I need to allow 65 minutes to drive from my house to the local train station, 12 minutes to park my car and 6 minutes to buy my ticket. What is the latest time that I can leave home in order to catch the 8 : 12 am train?

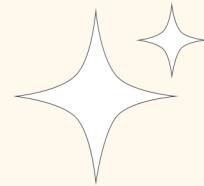
Answer: _____ : _____

- 2 David arrived at Manchester Airport at 22 : 43. His flight departed at 03 : 15. How many minutes did he have to wait?

Answer: _____ mins

- 3 A plane leaves London Airport at 21 : 30 and takes 5 hours and 45 minutes on its journey. At what time does it arrive?

- 4 Mr Lim drove from Singapore to Malacca. He finally arrived at Malacca at 04 : 10 after driving for a total of 5 hours and 30 minutes. Given that Mr Lim took a 45-minute rest during his journey, find the time he started his journey from Singapore. _____ : _____
- 5 My watch started going backwards at the same pace as it should have gone forward at 2.40 pm yesterday. Later that same day it read 11.55 am. What was the actual time?



Lesson 7

Basic Word Problems with Fractions



Let's Look Back

Understanding
Fractions

About this Lesson

Basic Word Problems
with Fractions

Let's Look Ahead

Word Problems with
Fractions

Objectives

- Learn to use a bar model to solve fraction word problems with known the whole
- Learn to use a bar model to solve fraction word problems with unknown the whole
- Learn to use a bar model to analyse the correspondence between quantities and fractions

Let's Get Ready

1 Calculate:

$$\frac{1}{2} \text{ of } 12 = \quad \frac{2}{3} \text{ of } 24 = \quad \frac{3}{5} \text{ of } 20 =$$

2 Fill in the blanks.

$$(1) \frac{1}{3} \text{ of } \underline{\hspace{2cm}} = 2$$

$$(2) \frac{1}{4} \text{ of } \underline{\hspace{2cm}} = 5$$

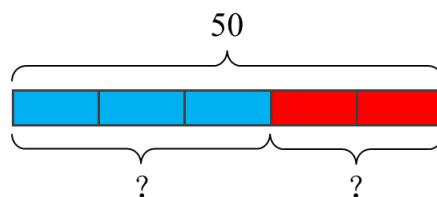
$$(3) \frac{2}{5} \text{ of } \underline{\hspace{2cm}} = 6$$

In Class

Learn and Discover

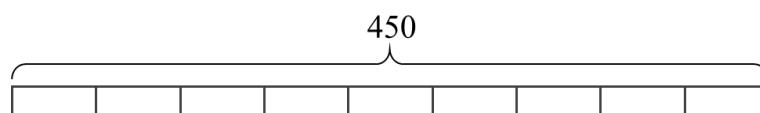
There are 50 red and blue marbles in a box. $\frac{3}{5}$ of them are blue marbles.

- How many blue marbles are there in the box?
- How many red marbles are there in the box?



Exploration 1

There are 450 pupils altogether in a school. $\frac{5}{9}$ of the pupils are boys. There are _____ girls.



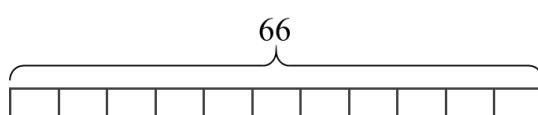
Practice

There are 210 ducks being raised on a farm. The amount of chickens raised on the farm is five sevenths the amount of ducks. How many chickens are being raised on the farm?

Exploration 2

Hellen ate 66 strawberries in three days. She ate $\frac{2}{11}$ of the total on the first day, and $\frac{5}{11}$ of the total on the second day.

- (a) How many more strawberries did she eat on the second day than on the first day?
- (b) How many strawberries did she eat on the third day?



Reasoning

Is Pip correct? If not, please correct his answer!

My toolbox contains 450 nails. $\frac{8}{15}$ are copper, $\frac{4}{15}$ are zinc and the rest are bent.

How many more copper nails are there than bent nails?

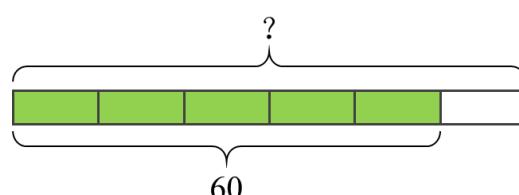
Pip's answer:

$$450 \div 15 = 30, 8 - 4 = 4, 40 \times 4 = 120.$$

There are 120 more copper nails than bent nails.

Learn and Discover

Jack sold 60 apples today, which is made up $\frac{5}{6}$ of the number of apples he brought today. How many apples did he bring today?



Exploration 3

- 1 If 24 gallons of water are poured into an empty tank, then $\frac{3}{4}$ of the tank is filled. How many gallons does a full tank hold?
- 2 Claire bought some balloons. $\frac{2}{7}$ of the balloons were red, $\frac{3}{7}$ of the balloons were yellow and the rest were blue. There are 18 blue balloons. How many balloons did Claire buy in total?

Practice

Johnny read a sci-fi novel. The first week he read $\frac{1}{5}$ of the whole book, and the second week he read another $\frac{1}{5}$ of the whole book. The third week he read the last 30 pages. How many pages are in the book?

Exploration 4

$\frac{7}{10}$ of the pupils in Class 3A are boys. There are 12 more boys than girls. How many pupils are there in Class 3A?

Challenge

Annie spent $\frac{2}{9}$ of her money on a new top and $\frac{1}{3}$ of her money on a skirt. She had £84 left. How much money did she originally have in total?

Homework

Teaching Time

Have you learnt everything from the class? Share your thoughts with your family on how to solve the question below.

Last Monday, $\frac{1}{9}$ of the pupils in our school were absent .

There are 540 pupils altogether in the school .

There were _____ pupils absent and _____ pupils present.



Day 1

- 1 Jenny had £72. She spent $\frac{3}{8}$ of the money on storybooks. How much did she have left? £ _____

2 Mr Lim has 50 apples. $\frac{3}{10}$ of them are green apples and the rest are red apples.

- (1) How many green apples does Mr Lim have?
- (2) How many red apples does he have?

3 A packet of flour weighs 200g. Miss Tan used $\frac{1}{4}$ of it for baking. How much flour had she left? _____ g

4 Jason and Sean have 120 marbles altogether, of which two-fifths are Sean's. How many marbles does Jason have?

5 Sally is $\frac{2}{5}$ the age of Ben. Ben will be 36 next year. How old is Sally now?



Day 2

- 1 In a flowerbed there are 120 tulips. $\frac{5}{12}$ of them are red, $\frac{1}{12}$ are yellow and the rest are orange. There are _____ red tulips and _____ orange tulips.

- 2 There are 270 books in the school library. $\frac{2}{9}$ of the books are fiction. $\frac{4}{9}$ of the books are non-fiction. The rest are reference books. How many reference books are in the library? _____

- 3 A highway repair crew is paving a 480 foot-long road. It paved $\frac{1}{8}$ of the total on the first day and $\frac{5}{8}$ of the total on the second day. How many feet of the road are left unpaved?

- 4 Melanie's mother bought 1 litre of milk. Melanie poured $\frac{1}{10}$ of the milk into a big bowl of cornflakes in the morning. Her mother used $\frac{2}{5}$ of the milk to make a cake in the afternoon. How much milk was left? (1L = 1000mL)
- 5 Bob had £77. He spent $\frac{3}{11}$ of his money on books and $\frac{4}{11}$ of his money on transportation. How much money did he spend altogether?



Day 3

- 1 In Mr Ang's class, $\frac{3}{5}$ of the pupils wore glasses.
18 pupils did not wear glasses.
How many pupils were there in Mr Ang's class?
A. 6 B. 27 C. 30 D. 40 E. 45
- 2 In a third off sale, a bike is sold for £ 84.
How much would it have sold for before the sale? £ _____
- 3 There are 14 boys in Lily's class. If $\frac{2}{3}$ of the class is boys, how many students are in Lily's class? How many girls are in Lily's class?

- 4 After I had bought a book costing £35, two-ninths of what I had left was £ 10.
How much money did I have at first? £ _____

- 5 Mary spent $\frac{3}{7}$ of her money on a bag. The difference between the amount spent and not used was £12. How much did Mary spend on the bag?



Day 4

- 1 $\frac{4}{9}$ of the passengers on the bus were adults, $\frac{4}{9}$ were seniors and the rest were children. There were 12 children. How many adults were there?

- 2 In my box of counters, $\frac{1}{6}$ of them are green, $\frac{1}{6}$ are blue and the rest are white. There are 32 white counters.
- (1) How many counters are there altogether? _____
- (2) How many blue counters are there? _____

- 3 In a car park, $\frac{7}{12}$ of the parking lots are for cars, $\frac{1}{12}$ are for buses and the rest are for motorcycles. There are 80 parking lots for motorcycles. How many parking lots are there?

4 Mrs Tang used $\frac{1}{15}$ of oil to cook her lunch, $\frac{4}{15}$ of oil to cook her dinner and had 600ml left. How much oil did she have at first? _____ ml

5 Sarah spent $\frac{3}{7}$ of her salary on a bag and another $\frac{1}{7}$ of her salary on a dress. She had £150 left. How much did she spend on the bag and dress? £ _____



Extensive Challenges

- 1 Agnes spent $\frac{3}{7}$ of her savings and an additional £8 on a present for her mother. If she had £32 left, how much did Agnes pay for the present?
- 2 A bag contains some sweets. $\frac{1}{6}$ are red, $\frac{1}{2}$ are green and the rest are yellow. There are 30 yellow sweets. How many sweets are there in the bag? _____ sweets
- 3 Ashwin took part in a triathlon. He cycled $\frac{1}{3}$ of the distance, swam $\frac{4}{9}$ of the distance and ran the rest of the race. He ran 900m. What was the total distance of the race?

- 4 Mr Ong made some tarts. He sold $\frac{2}{5}$ of them in the morning and $\frac{4}{15}$ of them in the afternoon. He sold 16 more tarts in the morning than in the afternoon. How many tarts are left?
- 5 At a musical performance, $\frac{5}{11}$ of the people were adults and the rest are children. $\frac{2}{7}$ of the children were boys. There were 18 more girls than boys. How many adults were there at the musical performance?



Think Academy



Join WhatsApp



Join Public Account



www.thinkacademy.uk



support.uk@tal.com



<https://www.facebook.com/groups/11plusinfo>