
# Numeracy Skills Level 2

# Welcome

This book covers some basic skills that will come up in the course you have enrolled in.

It is here to help you understand some of these skills to make your new course easier.

There are examples with activities for you to practice each skill, and to help you remember how to do each thing.

## Remember: This is not a test.

Take your time and ask for help from family, friends or your trainer if you need it.

Don’t worry if you can’t finish something, but try your best.

Don’t forget your trainer can help with any activities you are unsure of.

# Contents

## Lesson 2.1 Whole Numbers

Look at the table of numbers. These are **whole numbers**.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

This means the numbers count up by at least 1.

Numbers like 3½ or 2.5 are **NOT** whole numbers because they have parts that are smaller than 1.

In this table we have highlighted the numbers **21**, **54** and **76**:

These are all **whole numbers**.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

The table has 10 rows of 10 numbers. This column shows the numbers that you can divide by 10 and get a **whole number** answer:

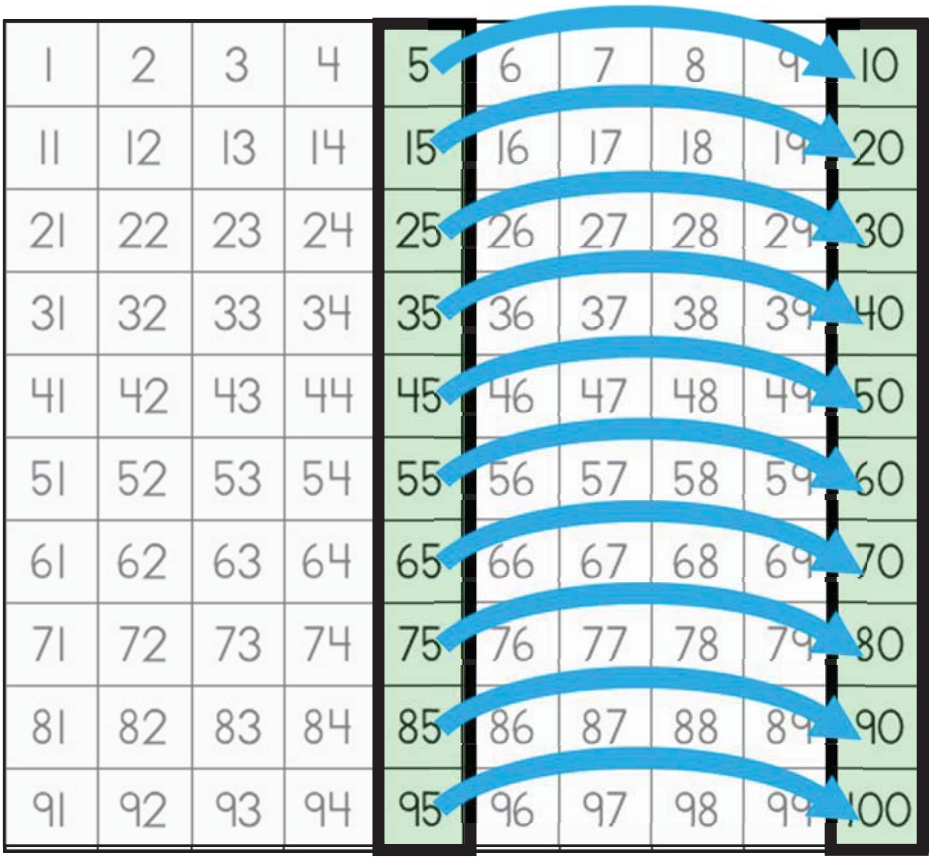
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

You can also count by 10's by moving down any column.

This table shows all of the numbers that you can divide by 5 and get a **whole number** answer:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

You can count by 5's by moving from number to number like this.



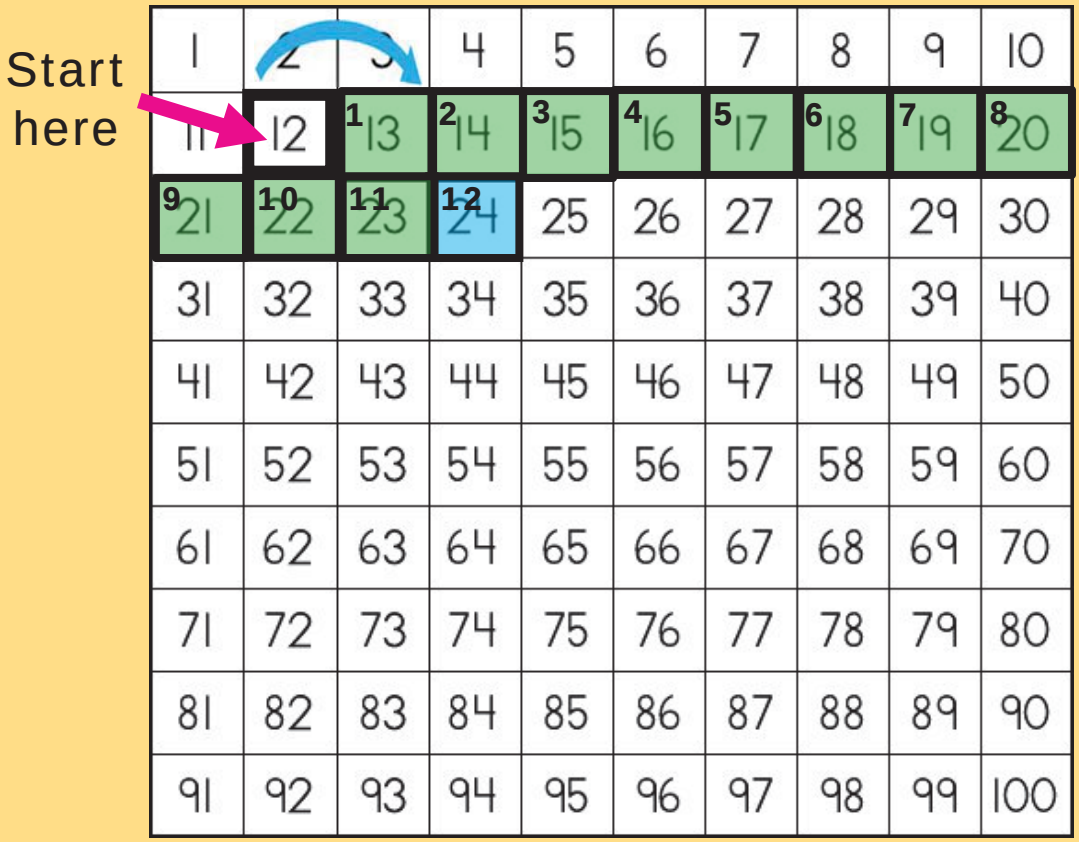
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

This table can also help you to work out simple addition (add) and subtraction (take away) problems.

**For example:**

12 + 12 = 24.

By starting at 12 and then shading 12 boxes on the table, going from left to right, you get to the answer 24.



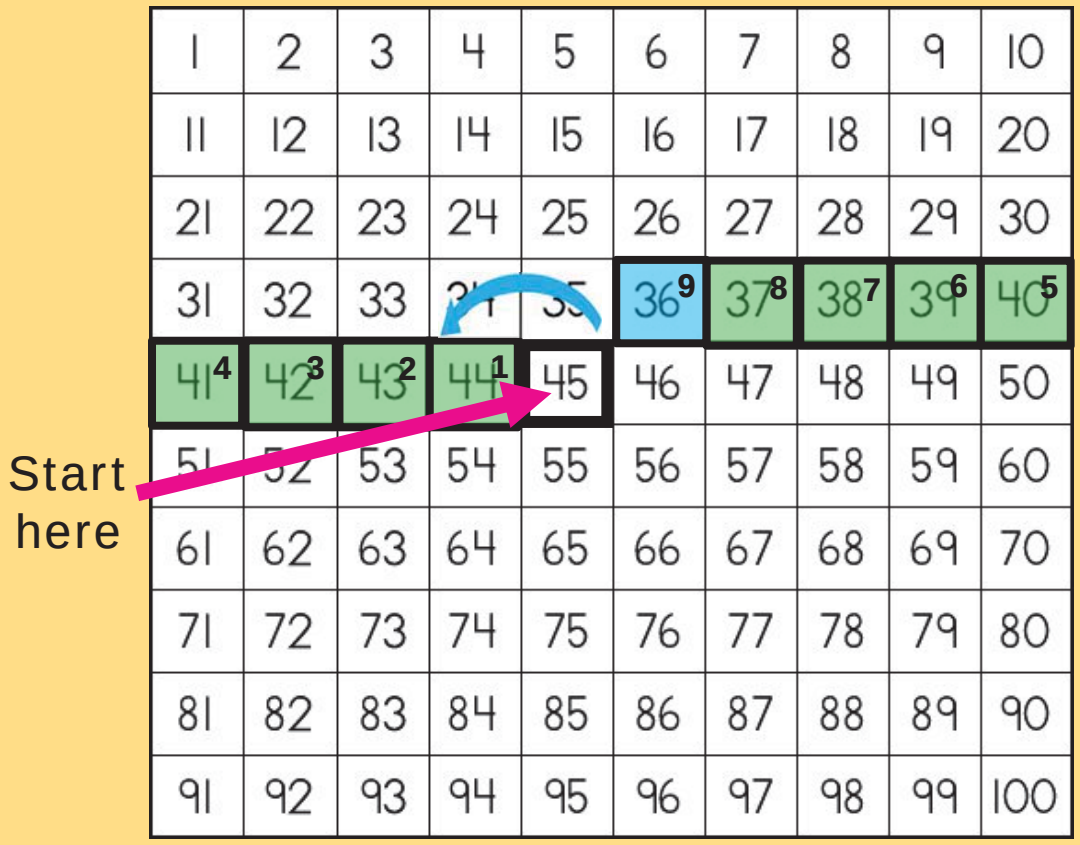

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

You can also use it to take one number away from another.

**For example:**

45 – 9 = 36.

By starting at 45 and then shading 9 boxes and working backwards, from right to left, you get the answer 36.



## Activity 2.1

1. Circle the following whole numbers in the chart.

**4, 17, 36, 55, 78, 93**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

2. Fill in the missing whole numbers in the chart:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 101 | 102 | 103 | 104 | | | 107 | 108 | 109 | 110 |
| 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | | 120 |
| 121 | | 123 | 124 | | 126 | 127 | 128 | 129 | 130 |
| 131 | 132 | 133 | 134 | 135 | | | | 139 | 140 |
| 141 | 142 | 143 | 144 | 145 | | | 148 | 149 | 150 |
| 151 | | 153 | 154 | 155 | 156 | 157 | 158 | 159 | |
| 161 | | 163 | 164 | 165 | | 167 | 168 | 169 | 170 |
| 171 | 172 | 173 | | 175 | 176 | | 178 | 179 | |
| 181 | 182 | 183 | | 185 | 186 | 187 | | 189 | 190 |
| | 192 | 193 | 194 | 195 | 196 | 197 | 198 | 199 | 200 |

3. Using the chart work out what you need to add to **66** to get **91**.

Shade the boxes and write down the answer in the space provided.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

**ANSWER:**

4. Using the chart work out what you need to add to **36** to get **57**.

   Shade the boxes and write down the answer in the space provided.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

**ANSWER:**

5. Using the chart work out what you get if you take **22** away from **31**.

   Find your starting number, shade the boxes and write down the answer in the space provided.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

**ANSWER:**

## Lesson 2.2 Place Value

All numbers are written using only ten symbols. These are called **digits**.

These are the digits we use to write all numbers:

**0 1 2 3 4 5 6 7 8 9**

Numbers bigger than 9 are written using two or more of these digits:

**Here are some examples:**

| | |
|---|---|
| 16 | 145 |
| 99 | 1160 |

You can see that the numbers are getting bigger as we add more digits. Where each number sits is important. This is called **place value**.

The table here shows how these numbers are made up:

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | 1 | 6 |
| | | 9 | 9 |
| | 1 | 4 | 5 |
| 1 | 1 | 6 | 0 |

Let's look more closely at each number...

The number **16** is made up of 1 x 10 and 6 x 1.

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | 1 | 6 |

The number **99** is made up of 9 x 10 and 9 x 1.

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | 9 | 9 |

The number **145** is made up of 1 x 100, 4 x 10 and 1 x 5.

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | 1 | 4 | 5 |

The number **1160** is made up of 1 x 1000, 1 x 100, 6 x 10 and 0 x 1.

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| 1 | 1 | 6 | 0 |

So how do we write the number one thousand and thirty six?

The number is made up of 1 x 1000, 3 x 10 and 6 x 1.

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| 1 | 0 | 3 | 6 |
| 1000 | | 30 | 6 |

Since there are no hundreds in the number we need to put a zero '0' in the hundreds column.

If we left the zero out we would have 136 which is wrong.

Each time we want to show a bigger number we just add one column to the left of the table and we know it is always 10 times bigger than the column on its right.

**Each new column on the left is ten times bigger.**

| Millions | Hundreds of Thousands | Tens of Thousands | Thousands | Hundreds | Tens | Units |
|---|---|---|---|---|---|---|
| | | | 1 | 0 | 3 | 6 |

x10 x10 x10 x10 x10 x10

## Activity 2.2

1. For the number **45**, what does the **4** mean? (Circle your answer)

   a) 4 Units

   b) 4 Tens

   c) 4 Hundreds

   d) 4 Thousands

2. For the number **652**, what does the **6** mean? (Circle your answer)

   a) 6 Units

   b) 6 Tens

   c) 6 Hundreds

   d) 6 Thousands

3. For the number **1458**, what does the **1** mean? (Circle your answer)

   a) 1 Units

   b) 1 Tens

   c) 1 Hundreds

   d) 1 Thousands

4. Which of the following numbers is **one thousand, three hundred and fifty seven**? (Circle your answer)

   a) 1357

   b) 13057

   c) 10357

   d) 157

5. Which of the following numbers is **two thousand and five**? (Circle your answer)

   a) 205

   b) 2500

   c) 2050

   d) 2005

6. Which of the following numbers is **five thousand and twenty two**? (Circle your answer)

   a) 5202

   b) 5220

   c) 5022

   d) 522

7. Write the number **one thousand and eight** in the table:

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | | |

8. Write the number **four thousand, seven hundred and ninety** in the table:

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | | |

9. Write the number **nine thousand, nine hundred and ninety nine** in the table:

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | | |

10. Write the number **five hundred and six** in the table:

| Thousands | Hundreds | Tens | Units |
|---|---|---|---|
| | | | |

## Lesson 2.3 Simple Calculations

Maths calculations use these symbols:

| Symbol | Operation | Example |
|---|---|---|
| ( ) | brackets | $1 + (3 - 2) = 2$ |
| $x^2$ $\sqrt{}$ | powers and roots | $2^2 = 4$ or $\sqrt{36} = 6$ |
| ÷ | divide, divided by, over | $10 \div 2 = 5$ |
| × | multiply, times | $2 \times 4 = 8$ |
| + | add, plus | $1 + 2 = 3$ |
| − | subtract, minus, take away | $5 - 2 = 3$ |

## Order of Operations

The order of operations is a set of rules to make sure we work out equations properly.

It tells us which part of an equation needs to be done first to make sure we get the right answer.

Look at this calculation:

$$5 + 2 \times 4$$

If you work from left to right you would get:

$$5 + 2 = 7$$

$$\text{Then } 7 \times 4 = 28$$

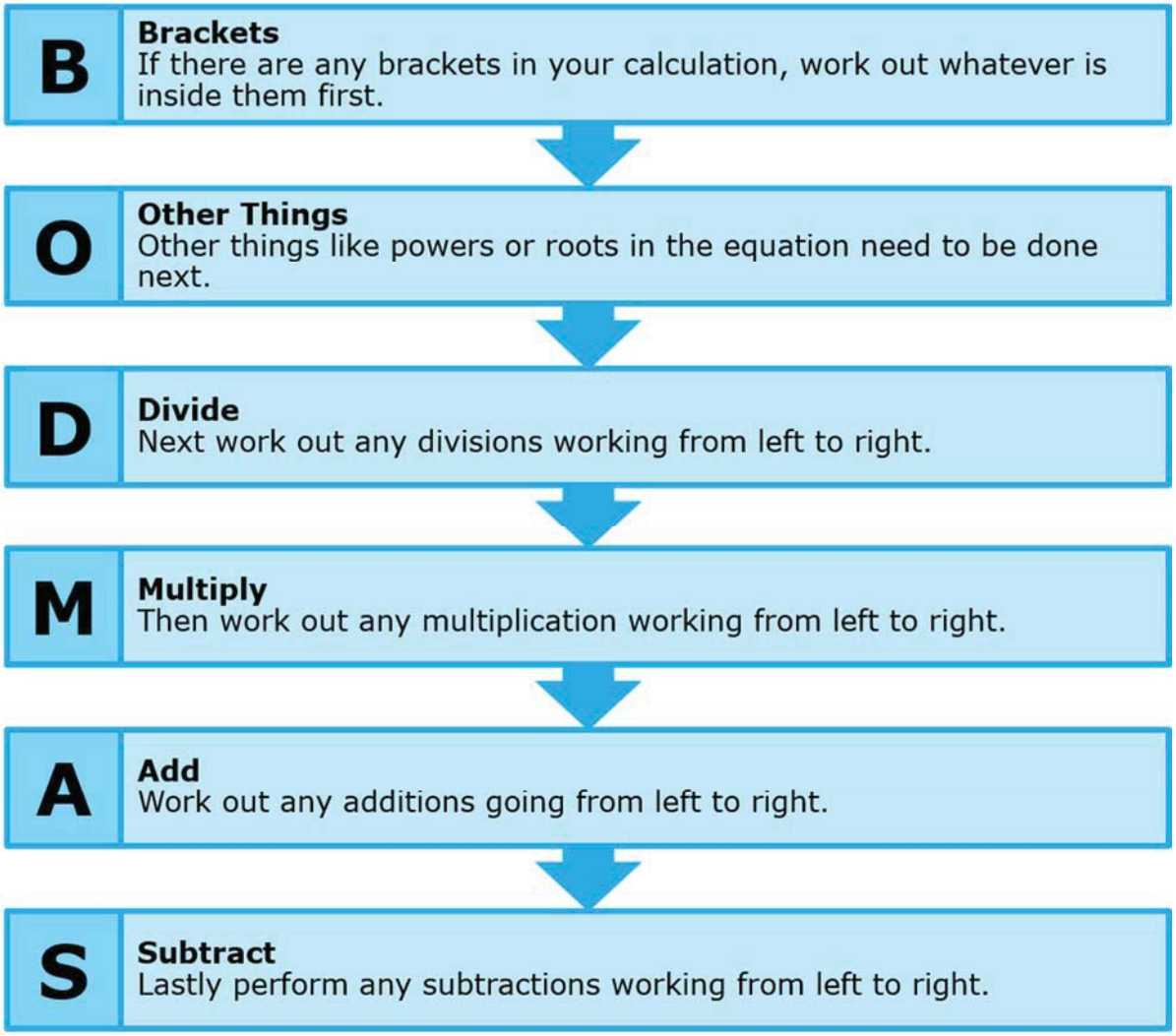
But the correct answer is actually **13.** So what went wrong? The rule is to do the multiplication **FIRST**:

$$2 \times 4 = 8$$

$$\text{Then add the } 5$$

$$8 + 5 = 13$$

To remember the correct order of operations (correct order to work out the equation) use the word **BODMAS.**



Let's work through an example:

**17 + (6 - 2) × 3**

| | |
|---|---|
| **Step 1**<br>**B** | Work out the **brackets** first:<br>17 + **(6 - 2)** × 3<br>= 17 + **4** × 3 |
| **Step 2**<br>**O** | Are there any **other things** to be calculated?<br>**No.** |
| **Step 3**<br>**D** | Are there any **divisions** to be worked out?<br>**No.** |
| **Step 4**<br>**M** | Work out the **multiplication** next:<br>17 + **4 × 3**<br>= 17 + **12** |
| **Step 5**<br>**A** | Work out the **addition**:<br>**17 + 12**<br>= **29** |
| **Step 6**<br>**S** | Are there any **subtractions** to make?<br>**No** – the equation is finished.<br>The answer is **29** |

## Activity 2.3

1. Work out the equations using **BODMAS**. You can use a calculator.

| | |
|---|---|
| a) 12 × (4 + 12) = | b) 72 − (3 × 15) = |
| c) 12 × (4 ÷ 2) = | d) 12 × (8 − 7) = |
| e) 18 + 9 − 13 = | f) 72 ÷ (3 + 15) = |
| g) 23 − 4 × 2 = | h) 23 × 4 ÷ 2 = |
| i) 12 − (4 × 2) = | j) 12 × (7 + 2) = |
| k) 12 + 8 ÷ 2 = | l) 72 − 4 × 15 = |
| m) 23 + 8 ÷ 2 = | n) (10 + 16) ÷ 2 = |
| o) 10 × 3 − 22 = | p) (4 × 8) ÷ 0.5 = |
| q) 24 ÷ (4 + 2) = | r) 24 × (4 ÷ 2) = |

| | |
|---|---|
| s) 18 ÷ 9 − 2 = | t) 18 + 9 ÷ 3 = |
| u) 10 − 3 × 2 = | v) 12 ÷ (2 + 2) = |
| w) 75 × (4 − 2) = | x) 38 + 4 × 2 = |
| y) 10 ÷ 3 × 3 = | z) 20 × (4 ÷ 8) = |

2. The brackets are missing from the equations. Put the brackets in to make the statement true.

| | |
|---|---|
| a) 9 − 1 × 7 = 56 | b) 40 − 10 + 10 = 20 |
| c) 6 − 8 − 4 = 2 | d) 50 − 8 ÷ 2 = 21 |

3. Put a tick or cross next to these statements to say if they are correct or incorrect:

| | | | |
|---|---|---|---|
| a) 4 + 3 × 5 = 35 | | b) 8 + 2 × 8 = 24 | |
| c) 3 + 7 × 2 = 17 | | d) 5 + 5 × 5 = 50 | |

## Lesson 2.4 Money

In Australia we use coins and notes to pay for things.

Here are the coins that we use. Each coin has its value written on it.

The **silver** coins are **cents**. The **gold** coins are **dollars**.


**100 cents = $1 (1 dollar)**

Here are the notes that we use. Each note has its value written on it.

These numbers are how many **dollars** the note is worth.

$5.00

$10.00

$20.00

$50.00

$100.00

You can add different coins together to get to the value of bigger coins or notes:

| | | |
|---|---|---|
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
| 20 x  | = |  |
|  | = |  |
|  | = |  |

| | | |
|---|---|---|
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
| 50 x  | = |  |
| 100 x  | = |  |

You can add different notes together to get the value of bigger notes:

| | | |
|---|---|---|
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |
|  | = |  |

You can also add coins and notes together:

 +  = $7.00

 +  +  +  = $16.50

## Using Money to Pay for Things

Here is an example of paying for items in a shop and getting back some change.

You are at the shops to buy **milk**, **bread** and **apples**.

- The **milk** costs **$3.00**
- The **bread** costs **$3.50**
- The **apples** cost **$4.00**

The **total** amount for your shopping is **$10.50**

You have the following money with you:

1 x  and 1 x 

How much change will you receive?

| Your Money | | Cost of Items | | Your Change |
|---|---|---|---|---|
| **$15.00** | **–** | **$10.50** | **=** | **$4.50** |

Here is another example:

You have filled up your car with **petrol**. The total is **$88.50**. When you go inside to pay for the petrol you also buy a **chocolate bar** for **$3.80**.

You have 2 x 


How much change should you receive?

**Step 1**

| Cost of Petrol | | Cost of Chocolate | | Total Cost |
|---|---|---|---|---|
| **$88.50** | **+** | **$3.80** | **=** | **$92.30** |

**Step 2**

| | | | | Your Money |
|---|---|---|---|---|
| **$50.00** | **x** | **2** | **=** | **$100.00** |

**Step 3**

| Your Money | | Total Cost | | Your Change |
|---|---|---|---|---|
| **$100.00** | **–** | **$92.30** | **=** | **$7.70** |

## Value for Money

Value for money is when you pay as little as possible for your items. You can buy items when they are **on sale**, **discounted** or if you buy items **in bulk** (lots of the same thing all at once).

Here are some examples of value for money:

**1 bottle** of juice normally costs **$3.00** but the shop is having a **sale** and you can buy **2 bottles** for **$5.00**.

This means you **save $1.00** off the **total price**, or **50c per bottle** of juice.

How do we work this out?

First work out how much 2 bottles would cost at the normal price:

**2 x $3.00 = $6.00**

Now take away the sale price from the original price:

**$6.00 - $5.00 = $1.00**

You save a total of $1.00. There are 2 bottles of juice. Divide the saving by the number of bottles:

**$1.00 ÷ 2 = $0.50c saving per bottle.**

Here is another example of value for money:

There is a special on for chocolate. If you buy **4 blocks** of chocolate you will save **$4.00. 1 block** of chocolate cost **$6.00**.

This means it will **cost $5.00 per block** of chocolate and it will **cost $20.00** for 4 blocks of chocolate.

How do we work this out?

First work out how much 4 blocks would cost at the normal price:

**4 x $6.00 = $24.00**

Now take away the saving amount from the original price:

**$24.00 - $4.00 = $20.00**

You pay a total of $20.00. There are 4 blocks of chocolate. Divide the cost by the number of blocks:

**$20.00 ÷ 4 = $5.00 saving per block.**

Here is another example:

2 brands of soft drink are on sale.

- Brand 1 has **2 litre** bottles on sale for **$1.50** each.
- Brand 2 has **1.5 litre** bottles on sale for **90c** each.

Which is the better deal?

To work this out we need to be able to compare the items. They are different sizes so we need to work out what each soft drink costs per litre then we can compare the 2 brands to figure out which is the better deal.

To work out the cost per litre of Brand 1 divide the price by the litre amount:

**$1.50 ÷ 2 = 0.75c**

This means **Brand 1** is **75c per litre**.

Next we work out the cost per litre of Brand 2. We do this the same way as before, dividing the price by the litre amount:

**0.90c ÷ 1.5 = 0.60c**

**Brand 2** is **60c per litre**.

This means **Brand 2** is the **better option** because it is **0.15c per litre cheaper** than Brand 1.

## Activity 2.4

1. Match the money with the correct value. Write the letters on the lines.

| | | |
|---|---|---|
| 1. _____ |  | a) 5c |
| 2. _____ |  | b) 10c |
| 3. _____ |  | c) $5 |
| 4. _____ |  | d) 50c |
| 5. _____ |  | e) $1 |
| 6. _____ |  | f) $2 |
| 7. _____ |  | g) 20c |
| 8. _____ |  | h) $10 |
| 9. _____ |  | i) $20 |
| 10. _____ |  | j) $50 |

2. Write down the total value of the money in the box:

a)

$10 + $2 + 10 cents + 5 cents = $

b)

$100 + $20 + $2 = $

c)

$50 + 50 cents + 20 cents = $

d)

$5 + $1 + 50 cents + 10 cents = $

3. Work out how much change you will get back from **$20** when buying the following items. You can use a calculator.




4. Work out how much change you will get back from a $20 note and a $5 note when buying the following items. You can use a calculator.

**Movie Ticket**


**$12.00**

**Popcorn**


**$5.00**

**Drink**

**$3.00**

**Chocolate**

**$3.50**

5. Biscuits are on sale for **$2.00** a packet, which is a saving of **55c**.

   What was the original price? (Circle your answer)

   a) $25.50

   b) $2.55

   c) $20.55

   d) $2.50

6. Cheese is on sale if you buy **4** blocks at a time. The regular price is **$2.50** per block but the deal is **4** blocks for **$8.00**.

   How much will you save by getting 4 blocks? (Circle your answer)

   a) $1.00

   b) $3.00

   c) $2.00

   d) $4.00.

7. Two similar items are on sale.

- Brand 1 has a **2kg** bag of rice for **$6.50**
- Brand 2 has a **3kg** bag of rice for **$7.50**

Which item is better value? (Show all workings)

8. You are going to get a massage for an hour.

Which of the following 3 options is the best value? (Show all workings)

- **Option 1**
  - $45 per hour.
- **Option 2**
  - 3 x 20 minute sessions at $17 per session.
- **Option 3**
  - $29 per 30 minutes.

## Lesson 2.5 Metric Measurements

In Australia we use the **Metric System** for all measurements including kilometres, metres, centimetres and millimetres. It also includes kilograms and grams and millilitres and litres.

This means the measurements we use can be easily compared.

Overseas some places use the **Imperial System** which is made up of miles, yards, feet and inches.

Metric measurements for **distance**:

| | | |
|---|---|---|
| Millimetre (mm) | As thin as a toothpick | |
| Centimetre (cm) | As wide as your fingernail | 10mm = 1cm |
| Metre (m) | A big step or a little wider than a door. | 100cm = 1m |
| Kilometre (km) | About the distance between bus stops. | 1000m = 1km |

Metric measurements for **weight**:

| | | |
|---|---|---|
| Grams (g) | A paperclip weighs about 1 gram. | |
| Kilograms (kg) | A large book weighs about 1 kilogram. | 1000g = 1kg |
| Tonnes (t) | A car weighs about 2 tonnes. | 1000kg = 1t |

Metric measurements for **liquid**:

| | | |
|---|---|---|
| Millilitre (ml) | 20 drops of liquid. | |
| Litre (ltr) | A carton of milk | 1000ml = 1ltr |

Measurements for **other things**:

| | |
|---|---|
| Temperature in degrees Celsius (°C) | Boiling water is 100°C. People have a temperature of about 35°C. |
| Second | Its takes about 1 second to say 'one thousand and one'. |
| Minute | There are 60 seconds in 1 minute. |
| Hour | There are 60 minutes in 1 hour. |
| Day | The time from one sunrise to the next. There are 24 hours in 1 day. |

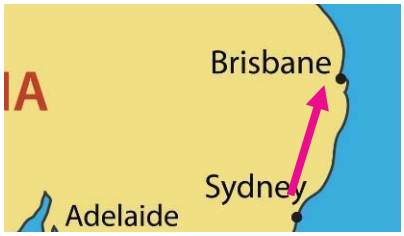
## Activity 2.5

1. Use a ruler to measure the following items. Write down how long each item is in the space under the picture:

| A pen | This page in your book |
|---|---|
|  _____cm |  _____cm |

| A credit card, licence or membership card | A mobile phone |
|---|---|
|   _____mm |  _____mm |

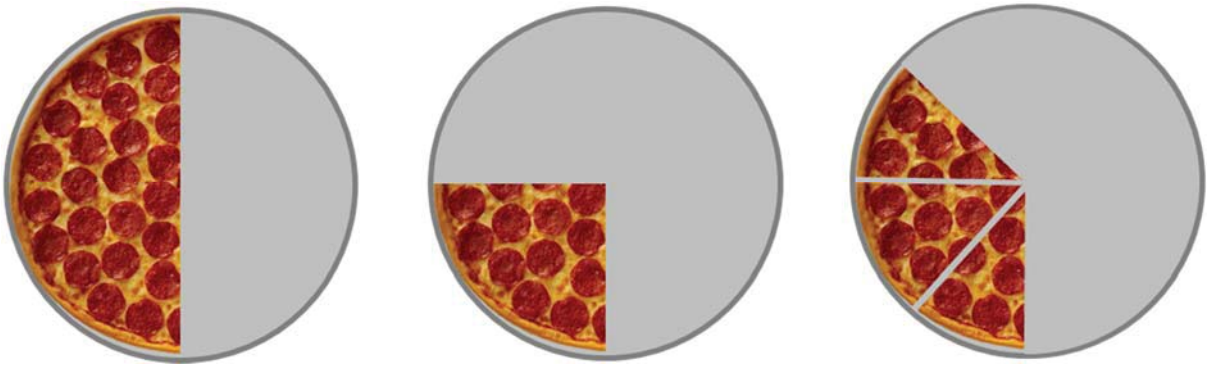
2. Match the most appropriate unit of measurement to the examples. Write the letters on the lines.

| | | |
|---|---|---|
| 1. _____ |  Distance from Sydney to Brisbane. | a) cm |
| 2. _____ |  Amount of fuel that you put in your car. | b) ltr |
| 3. _____ |  Your height. | c) kg |
| 4. _____ |  Your weight. | d) km |

## Lesson 2.6 Fractions

A **Fraction** is a part of a whole thing.

A good example of working with fractions is to look at a pizza. Pizzas are usually cut into 8 pieces.



| $\frac{1}{2}$ (one-half) | $\frac{1}{4}$ (one-quarter) | $\frac{3}{8}$ (three-eighths) |
|---|---|---|

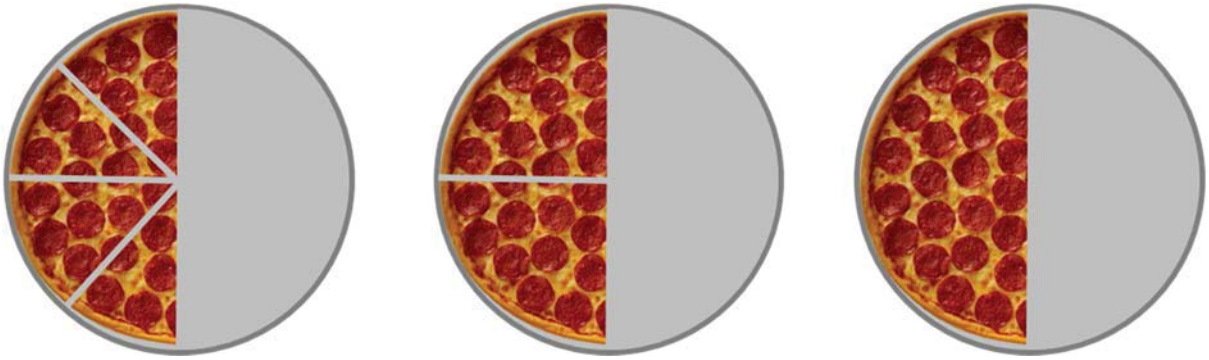
$\frac{1}{2}$

The **top number** of the fraction tells you how many slices you have.

The **bottom number** tells you how many slices the whole pizza was cut into.

Some fractions might use different numbers, but they equal the same thing.

| $\frac{4}{8}$ (four-eighths) | $\frac{2}{4}$ (two-fourths or two-quarters) | $\frac{1}{2}$ (one-half) |
|---|---|---|



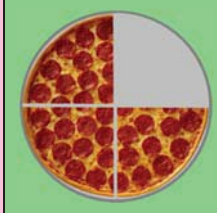
By looking at the pictures you can see that all of these fractions still equal half a pizza. It is just cut up in different ways.

It is usually best to show a fraction using the simplest or smallest numbers possible, so instead of saying $\frac{4}{8}$ we say $\frac{1}{2}$ .

You can also add fractions together. This is easy if the bottom number of both fractions (the denominator) is the same number:

| | | | | | | |
|---|---|---|---|---|---|---|
| $\frac{1}{4}$ (one-quarter) | + | $\frac{1}{4}$ (one-quarter) | = | $\frac{2}{4}$ (two-quarters) | = | $\frac{1}{2}$ (one-half) |
|  | + |  | = |  | = |  |

**Or**

| | | | | | | |
|---|---|---|---|---|---|---|
| $\frac{5}{8}$ (five-eighths) | + | $\frac{1}{8}$ (one-eighth) | = | $\frac{6}{8}$ (six-eighths) | = | $\frac{3}{4}$ (three-quarters) |
|  | + |  | = |  | = |  |

But what do you do if the bottom numbers (denominators) are not the same?

| $\frac{3}{8}$ (three-eighths) | + | $\frac{1}{4}$ (one-quarter) | = | ? |
|---|---|---|---|---|
|  | + |  | = | |

You need to make the bottom numbers the same so you can add the fractions together!

The trick is to find a number that both the denominators fit in to. In this case they both fit into **8**.

So how many **4's** are there in **8**?

The answer is **2**.

So we multiply the top and the bottom numbers in $\frac{1}{4}$ by **2**

(1 x 2 and 4 x 2) and we get $\frac{2}{8}$ .

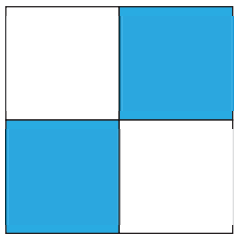
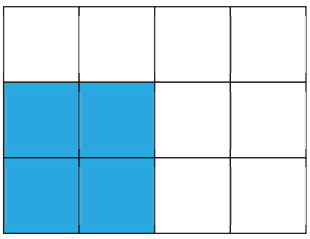
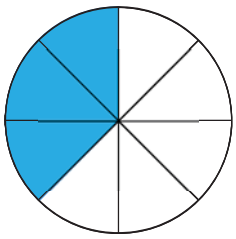
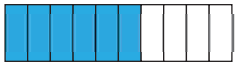
Now the denominators of both fractions are the same and we can easily add them together.

| $\frac{3}{8}$ (three-eighths) | + | $\frac{2}{8}$ (two-eighths) | = | $\frac{5}{8}$ (one-quarter) |
|---|---|---|---|---|
|  | + |  | = |  |

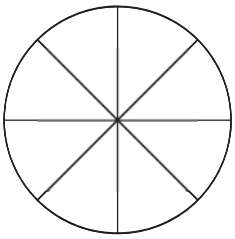
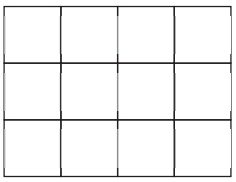
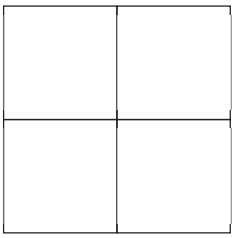
## Activity 2.6

1. Write down the fraction of the shaded section of each of these shapes.

   Try to write down the **simplest** fraction possible.

| | | | |
|---|---|---|---|
|  |  |  |  |
| | | | |

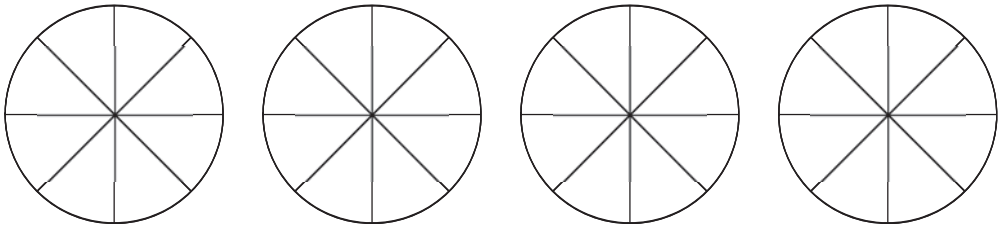
2. Shade the shapes to match the fractions.

| | | | |
|---|---|---|---|
|  |  |  |  |
| $\frac{3}{4}$ | $\frac{2}{5}$ | $\frac{1}{3}$ | $\frac{1}{2}$ |

3. A group of friends have ordered pizzas for dinner.

   They started off with **4 pizzas** and now there is now only $\frac{1}{2}$ **a pizza** left.

   How much pizza did they eat? Write your answer as a fraction.



**ANSWER:**

## Lesson 2.7 Decimals

A **decimal number** has a whole number followed by a **decimal point** followed by another number that represents a fraction out of 10.

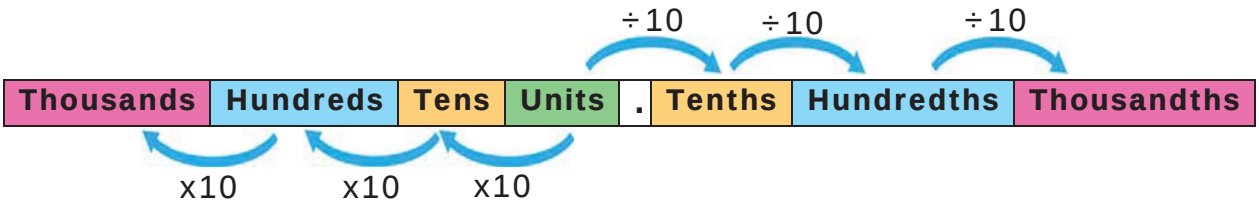

When we talk about decimals we need to use the right language.

The whole number is measured in **units**. In this example there are **85 units**.

Any number that comes after the decimal point is a fraction of unit that gets smaller and smaller the further you move past the decimal point.

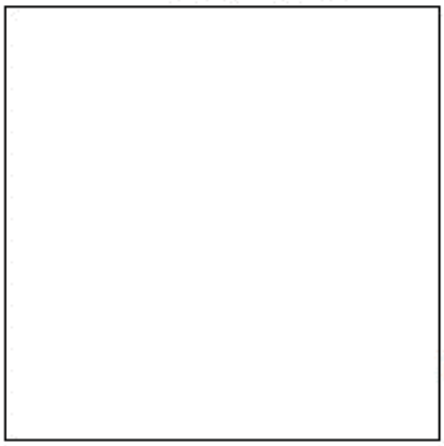
The same way that place value works for **tens**, **hundreds** and **thousands**, decimals work in the other direction by **tenths**, **hundredths** and **thousandths**.

Each time you move to the right the number is being divided by 10.

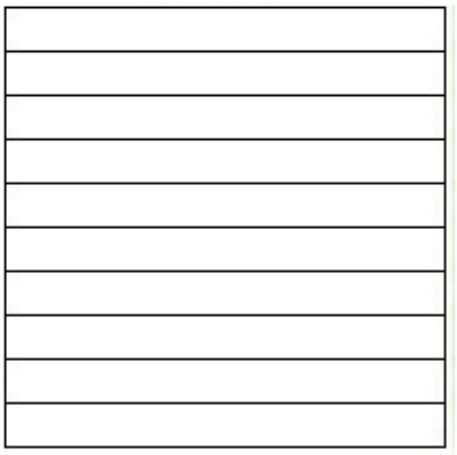



Here is an example of how a unit is divided into tenths, hundredths and thousandths:

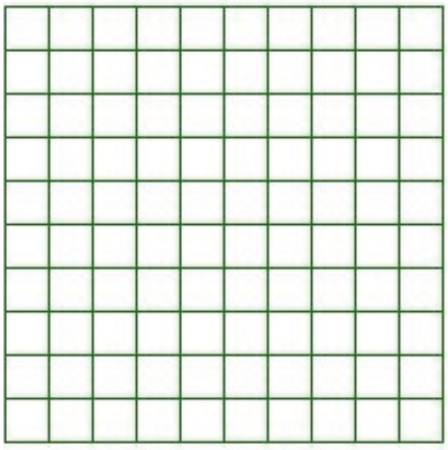
**The ones / units**



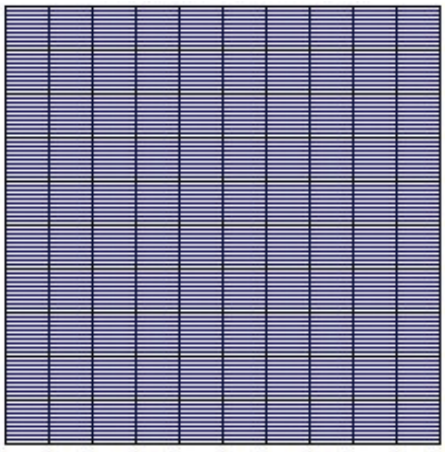
**The tenth / 10th**



**The hundredth / 100th**



**The thousandth / 1000th**



Let's put this idea into practice. Look at this block of chocolate:

It is 1 whole block of chocolate. 1 unit. But it is split into 10 smaller, equal parts.

Each one of those is $\frac{1}{10}$ of the block of chocolate or **0.1** when written as a decimal.

**The whole block = 1**

**1 piece = 0.1**

**2 pieces = 0.2**

**3 pieces = 0.3 and so on.**

## Activity 2.7

1. For the number **65.18**, what does the **8** mean? (Circle your answer)

   a) 8 Units

   b) 8 Tens

   c) 8 Hundredths

   d) 8 Tenths

2. For the number **652.13**, what does the **1** mean? (Circle your answer)

   a) 1 Unit

   b) 1 Tenth

   c) 1 Hundredth

   d) 1 Thousandth

3. For the number **1458.296**, what does the **6** mean? (Circle your answer)

   a) 6 Units

   b) 6 Tenths

   c) 6 Hundredths

   d) 6 Thousandths

4. Write the number **one thousand and eight point nine** in the table:

| Thousands | Hundreds | Tens | Units | . | Tenths | Hundredths |
|---|---|---|---|---|---|---|
| | | | | | | |

5. Write the number **four thousand, seven hundred and ninety point six four** in the table:

| Thousands | Hundreds | Tens | Units | . | Tenths | Hundredths |
|---|---|---|---|---|---|---|
| | | | | | | |

6. Write the number **nine thousand, eight hundred and seventy nine point zero two** in the table:

| Thousands | Hundreds | Tens | Units | . | Tenths | Hundredths |
|---|---|---|---|---|---|---|
| | | | | | | |

7. Write the number **five hundred and six point eight five** in the table:

| Thousands | Hundreds | Tens | Units | . | Tenths | Hundredths |
|---|---|---|---|---|---|---|
| | | | | | | |

## Lesson 2.8 Percentages

A **percentage** is a measurement or value out of 100.


For example **1%** means **1 per 100**. If **1%** of people in Australia swim every morning it means for every **100** people you ask, only **1** would swim every morning.

**1 out of 100 or 1%**

We have shaded the first **50 boxes** in this table. That means **50 out of 100** or **50%** of the table is shaded.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

This table has had the first **25 boxes** shaded. **25%** of the table is shaded.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

How much is unshaded?

**Work this out with the following equation:**

**100 – 25 = 75**

**This means 75% of the table is not shaded.**

We have shaded the whole table here:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

100 out of 100 boxes are shaded. **100% are shaded.**

This table has every second box shaded. What percentage is shaded here?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

$\frac{50}{100}$ or $\frac{1}{2}$ or 50%.

It doesn't matter if we shade some at the start and some at the end. All that matters is how many are shaded in total.

These examples both show 50% shaded:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Now let's put it to use. It's easy to work out a percentage if there are 100 parts, but what if there are 80 parts?

How do we work out a percentage of 80 parts?

Here is an example:

We want to find out what **70%** of **80** is.

The first step is to get the value of 70%. The clue is **70 out of 100**.

As a fraction this is written as $\frac{70}{100}$.

That line means we divide the top number by the bottom number.

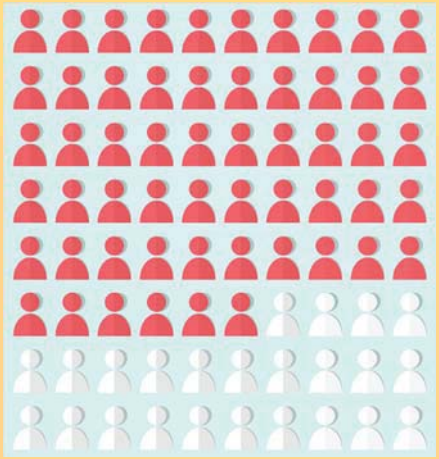
**70 ÷ 100 = 0.7**

Next we multiply **0.7** by **80**. This will give us the answer.

**0.7 x 80 = 56**

That means **70%** of **80** is **56**.

So if 70% of people like to eat vegemite sandwiches, 56 out of every 80 people you ask like to eat vegemite sandwiches.



## Activity 2.8

1. Here is a space for a park. The space is a **10m** x **10m** grid and has **100 boxes** in total.

   Mark the right number of squares to design the park using the percentages below.

   The park needs to be:

   - **40%** Grass (use the letter '**G**').
   - **25%** Trees (use '**T**').
   - **15%** Flowers (use '**F**').
   - **15%** Playground (use '**P**').
   - **5%** Water (use '**W**').

2. What is **25%** of **20**? (Circle your answer)

   a) 2

   b) 8

   c) 4

   d) 5

3. What is **75%** of **40**? (Circle your answer)

   a) 30

   b) 20

   c) 25

   d) 10

4. What is **50%** of **90**? (Circle your answer)

   a) 30

   b) 45

   c) 66

   d) 55

## Lesson 2.9 Tables and Graphs

Sometimes information is put into a table of rows and columns to make it easier to find what you are looking for.

Things like class timetables, bus or train times and football scores are often written in tables. Here are some examples:

| England: Premier League | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Team** | Pld. | W | D | L | F | A | Pts. |
| **1** | **Man. United** | 38 | 23 | 11 | 4 | 78 | 37 | 80 |
| **2** | **Chelsea** | 38 | 21 | 8 | 9 | 69 | 33 | 71 |
| **3** | **Man / City** | 38 | 21 | 8 | 9 | 60 | 33 | 71 |
| **4** | **Arsenal** | 38 | 19 | 11 | 8 | 72 | 43 | 68 |
| **5** | **Tottenham** | 38 | 16 | 14 | 8 | 55 | 46 | 62 |
| **6** | **Liverpool** | 38 | 17 | 7 | 14 | 59 | 44 | 58 |
| **7** | **Everton** | 38 | 13 | 15 | 10 | 51 | 45 | 54 |
| **8** | **Fulham** | 38 | 11 | 16 | 11 | 49 | 43 | 49 |
| **9** | **Aston Villa** | 38 | 12 | 12 | 14 | 48 | 59 | 48 |
| **10** | **Sunderland** | 38 | 12 | 11 | 15 | 45 | 56 | 47 |
| **11** | **West Brom** | 38 | 12 | 11 | 15 | 56 | 71 | 47 |
| **12** | **Newcastle** | 38 | 11 | 13 | 14 | 56 | 57 | 46 |
| **13** | **Stoke** | 38 | 13 | 7 | 18 | 46 | 48 | 46 |
| **14** | **Bolton** | 38 | 12 | 10 | 16 | 52 | 56 | 46 |

| | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
|---|---|---|---|---|---|
| 9:00 – 9:45 | English | Maths | Sport | Music | English |
| 9:45 – 10:30 | English | Maths | Science | Maths | English |
| 10:30 – 11:00 | *Break* | *Break* | *Break* | *Break* | *Break* |
| 11:00 – 11:45 | Sport | English | Maths | English | Science |
| 11:45 – 12:30 | Maths | Science | Maths | English | Maths |
| 12:30 – 1:30 | *Lunch* | *Lunch* | *Lunch* | *Lunch* | *Lunch* |
| 1:30 – 2:15 | Art | Technology | English | History | Sport |
| 2:15 – 3:30 | Art | Languages | History | Technology | Sport |

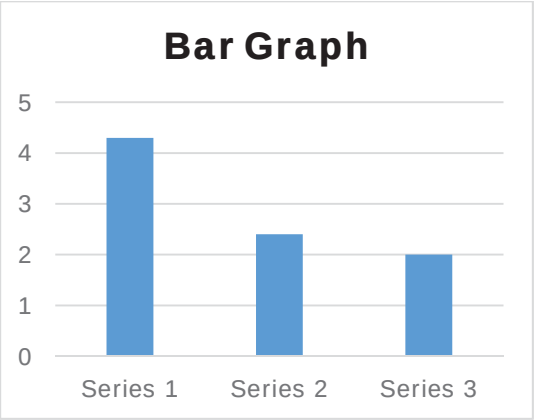
You can find information quickly when it is put into a table. All you need to do is find where the 2 relevant pieces of information meet.

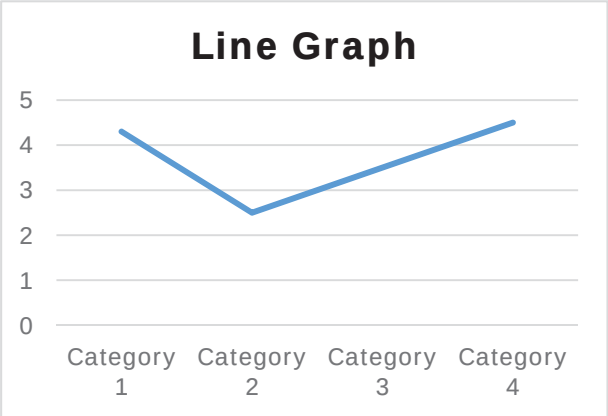
For example, selecting your football team then working along the same line to see how many games they have won.

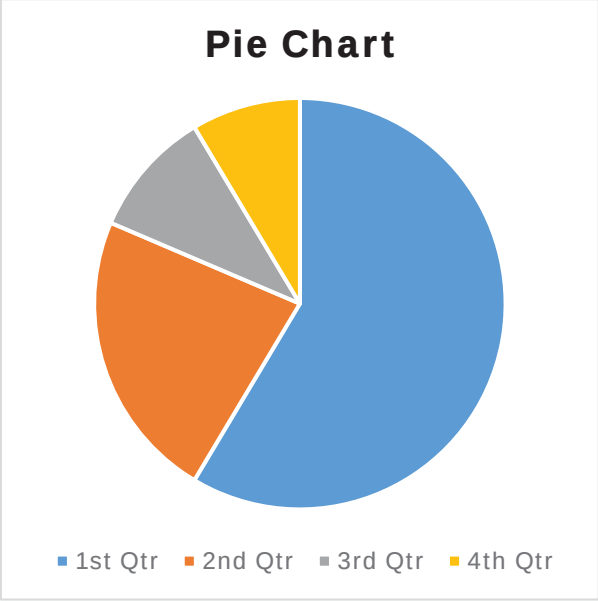
| England: Premier League | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Team** | Pld. | W | D | L | F | A | Pts. |
| **1** | **Man. United** | 38 | 23 | 11 | 4 | 78 | 37 | 80 |
| **2** | **Chelsea** | 38 | 21 | 8 | 9 | 69 | 33 | 71 |
| **3** | **Man/ City** | 38 | 21 | 8 | 9 | 60 | 33 | 71 |
| **4** | **Arsenal** | 38 | 19 | 11 | 8 | 72 | 43 | 68 |
| **5** | **Tottenham** | 38 | 16 | 14 | 8 | 55 | 46 | 62 |
| **6** | **Liverpool** | 38 | 17 | 7 | 14 | 59 | 44 | 58 |
| **7** | **Everton** | 38 | 13 | 15 | 10 | 51 | 45 | 54 |
| **8** | **Fulham** | 38 | 11 | 16 | 11 | 49 | 43 | 49 |
| **9** | **Aston Villa** | 38 | 12 | 12 | 14 | 48 | 59 | 48 |
| **10** | **Sunderland** | 38 | 12 | 11 | 15 | 45 | 56 | 47 |
| **11** | **West Brom** | 38 | 12 | 11 | 15 | 56 | 71 | 47 |
| **12** | **Newcastle** | 38 | 11 | 13 | 14 | 56 | 57 | 46 |
| **13** | **Stoke** | 38 | 13 | 7 | 18 | 46 | 48 | 46 |
| **14** | **Bolton** | 38 | 12 | 10 | 16 | 52 | 56 | 46 |

Another way information from a table can be shown is by using a graph.

Basic graphs are:



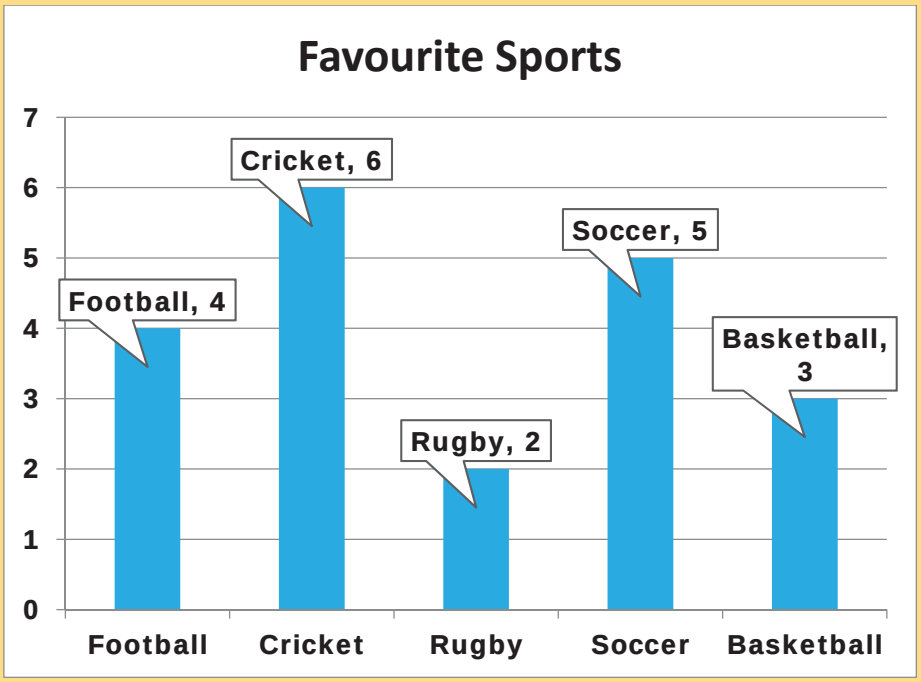
A **Bar Graph** uses a range of bars to display information.

Here is an example:

We asked **20** people what their **favourite sport** is. These are the results:

| Football | Cricket | Rugby | Soccer | Basketball |
|---|---|---|---|---|
| 4 | 6 | 2 | 5 | 3 |

This information can be displayed in a bar graph like this:




Bar graphs are very useful for being able to quickly see and compare all of the information in a table. You can see that **Cricket** is the **most** popular and **Rugby** is the **least** popular sport.

You can use a bar graph whenever you are working with information that can be compared or divided into the same types of units.

A **Line Graph** shows information that is connected in a series and is used to show information over time.

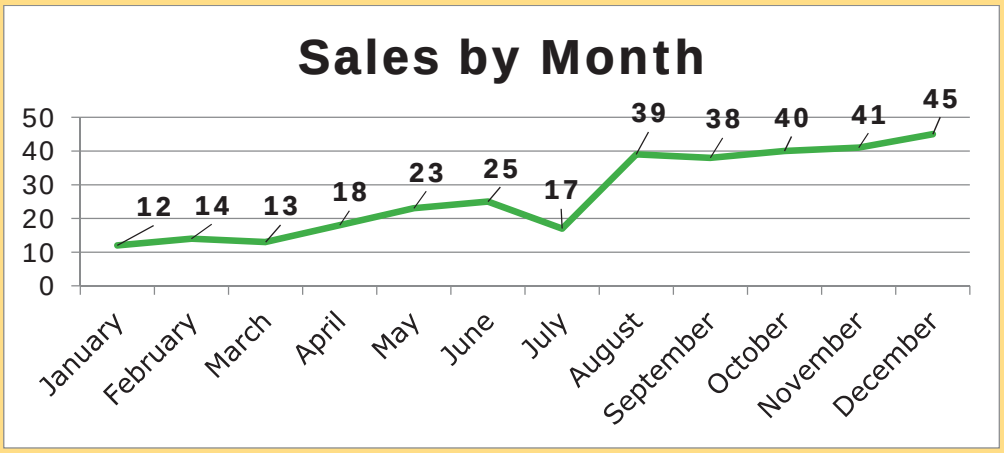
Here is an example:

These are the number of units sold each month for the last year:

| | |
|---|---|
| January | 12 |
| February | 14 |
| March | 13 |
| April | 18 |
| May | 23 |
| June | 25 |

| | |
|---|---|
| July | 17 |
| August | 39 |
| September | 38 |
| October | 40 |
| November | 41 |
| December | 45 |

This information can be displayed in a line graph like this:




Sales have increased over the year with a big improvement between July and August after a drop from June to July.

Line graphs are useful for seeing trends or patterns over time.

A **Pie Chart** is a graph in the shape of a circle that is cut into slices to show how much of the total amount each item makes up.

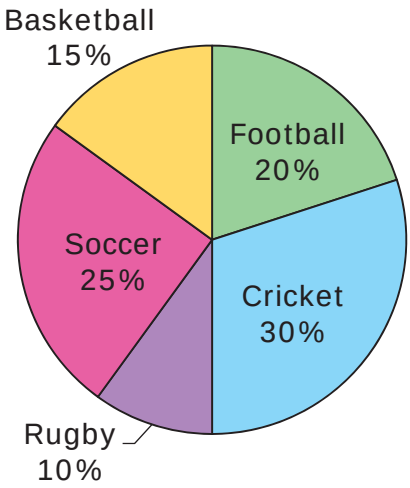
Using the same information as the bar graph the pie chart looks like this:

**Favourite Sport**

| Football | Cricket | Rugby | Soccer | Basketball |
|---|---|---|---|---|
| 4 | 6 | 2 | 5 | 3 |


Pie charts are really useful for comparing the information in the table to see which items make up the most or least number of parts.

Pie charts can also show you the percentage that each item makes up.



## Activity 2.9

1. Use the train timetable to answer the following questions:

| Morning (am)/Afternoon (**pm**) > | am | am | am | am | am | am | am | am | am |
|---|---|---|---|---|---|---|---|---|---|
| Lilydale Station (Lilydale) | 9:19 | - | 9:39 | - | 9:59 | - | 10:19 | - | 10:39 |
| Mooroolbark Station (Mooroolbark) | 9:24 | - | 9:44 | - | 10:04 | - | 10:24 | - | 10:44 |
| Croydon Station (Croydon) | 9:28 | - | 9:48 | - | 10:08 | - | 10:28 | - | 10:48 |
| Ringwood East Station (Ringwood East) | 9:32 | - | 9:52 | - | 10:12 | - | 10:32 | - | 10:52 |
| Ringwood Station (Ringwood) | 9:35 | 9:45 | 9:55 | 10:05 | 10:15 | 10:25 | 10:35 | 10:45 | 10:55 |
| Heatherdale Station (Mitcham) | 9:38 | 9:48 | 9:58 | 10:08 | 10:18 | 10:28 | 10:38 | 10:48 | 10:58 |
| Mitcham Station (Mitcham) | 9:40 | 9:50 | 10:00 | 10:10 | 10:20 | 10:30 | 10:40 | 10:50 | 11:00 |
| Nunawading Station (Nunawading) | 9:42 | 9:52 | 10:02 | 10:12 | 10:22 | 10:32 | 10:42 | 10:52 | 11:02 |
| Blackburn Station (Blackburn) | 9:45 | 9:55 | 10:05 | 10:15 | 10:25 | 10:35 | 10:45 | 10:55 | 11:05 |
| Laburnum Station (Blackburn) | 9:47 | 9:57 | 10:07 | 10:17 | 10:27 | 10:37 | 10:47 | 10:57 | 11:07 |
| Box Hill Station (Box Hill) | 9:50 | 10:00 | 10:10 | 10:20 | 10:30 | 10:40 | 10:50 | 11:00 | 11:10 |
| Mont Albert Station (Mont Albert) | 9:52 | 10:02 | 10:12 | 10:22 | 10:32 | 10:42 | 10:52 | 11:02 | 11:12 |
| Surrey Hills Station (Surrey Hills) | 9:54 | 10:04 | 10:14 | 10:24 | 10:34 | 10:44 | 10:54 | 11:04 | 11:14 |
| Chatham Station (Surrey Hills) | 9:56 | 10:06 | 10:16 | 10:26 | 10:36 | 10:46 | 10:56 | 11:06 | 11:16 |
| Canterbury Station (Canterbury) | 9:57 | 10:07 | 10:17 | 10:27 | 10:37 | 10:47 | 10:57 | 11:07 | 11:17 |
| East Camberwell Station (Camberwell) | 9:59 | 10:09 | 10:19 | 10:29 | 10:39 | 10:49 | 10:59 | 11:09 | 11:19 |
| Camberwell Station (Camberwell) | 10:01 | 10:11 | 10:21 | 10:31 | 10:41 | 10:51 | 11:01 | 11:11 | 11:21 |
| Auburn Station (Hawthorn East) | 10:03 | 10:13 | 10:23 | 10:33 | 10:43 | 10:53 | 11:03 | 11:13 | 11:23 |
| Glenferrie Station (Hawthorn) | 10:05 | 10:15 | 10:25 | 10:35 | 10:45 | 10:55 | 11:05 | 11:15 | 11:25 |
| Hawthorn Station (Hawthorn) | 10:07 | 10:17 | 10:27 | 10:37 | 10:47 | 10:57 | 11:07 | 11:17 | 11:27 |
| Burnley Station (Burnley) | 10:10 | 10:20 | 10:30 | 10:40 | 10:50 | 11:00 | 11:10 | 11:20 | 11:30 |
| Richmond Station (Richmond) | 10:13 | 10:23 | 10:33 | 10:43 | 10:53 | 11:03 | 11:13 | 11:23 | 11:33 |
| Flinders Street Station (Melbourne City) **ARR** | 10:17 | 10:27 | 10:37 | 10:47 | 10:57 | 11:07 | 11:17 | 11:27 | 11:37 |

a) If you catch the train from Mitcham Station at 10:00am what time will you arrive at Flinders Street Station?

**Answer:**

b) What time would you need to be at Box Hill Station to get to Flinders Street Station by 11:30am?

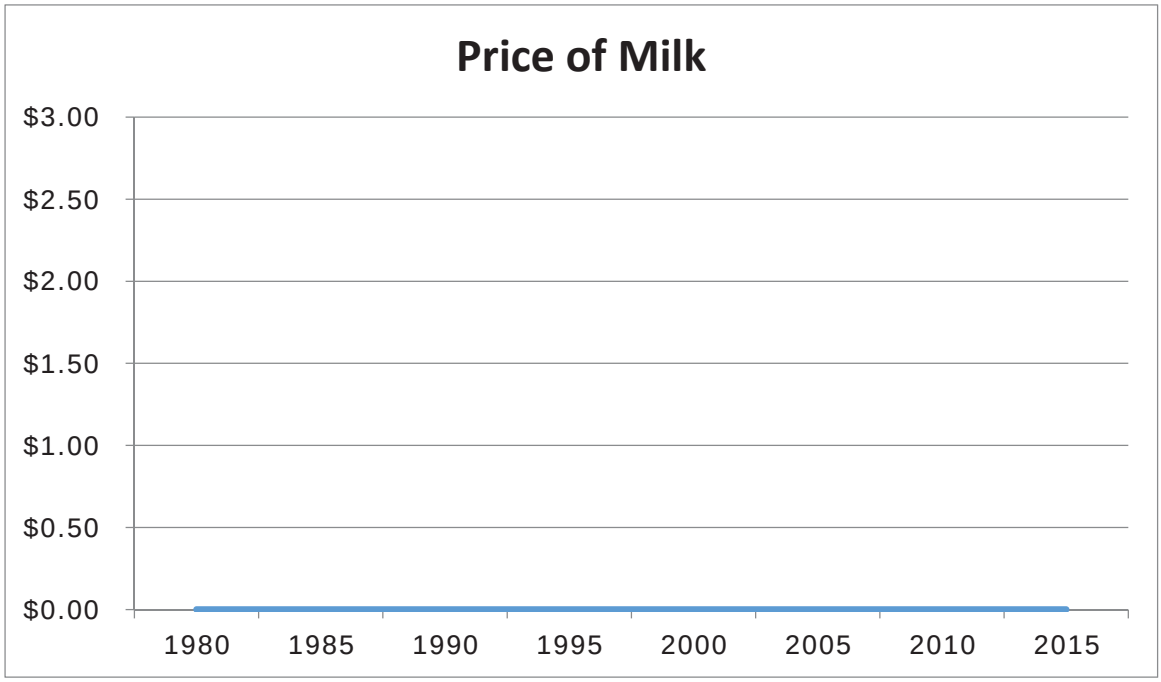
**Answer:**

c) How many times does a train stop at Croydon Station on the timetable?

**Answer:**

2. Chart the price of milk on the line graph using the information in the table.

| Year | Price per litre |
|---|---|
| 1980 | $1.50 |
| 1985 | $1.75 |
| 1990 | $1.75 |
| 1995 | $2.00 |
| 2000 | $2.00 |
| 2005 | $2.25 |
| 2010 | $2.50 |
| 2015 | $2.50 |



3. Draw a bar graph using the data in the table.

## Favourite Movies

| Drama | Action | Comedy | Romance | Horror |
|---|---|---|---|---|
| 15 | 10 | 20 | 10 | 5 |

## Lesson 2.10 Clocks

There are 2 types of clocks:

**Digital Clocks**

These clocks have digits like 0, 1, 2, 3


**Analogue Clocks**

These clocks have hands that point to numbers.

## Digital Clocks

Digital clocks show the time using numbers like this:

**Hours : Minutes**

For example:


**6:30**
**6 hours and 30 minutes**


**8:00**
**8 hours and 0 minutes**

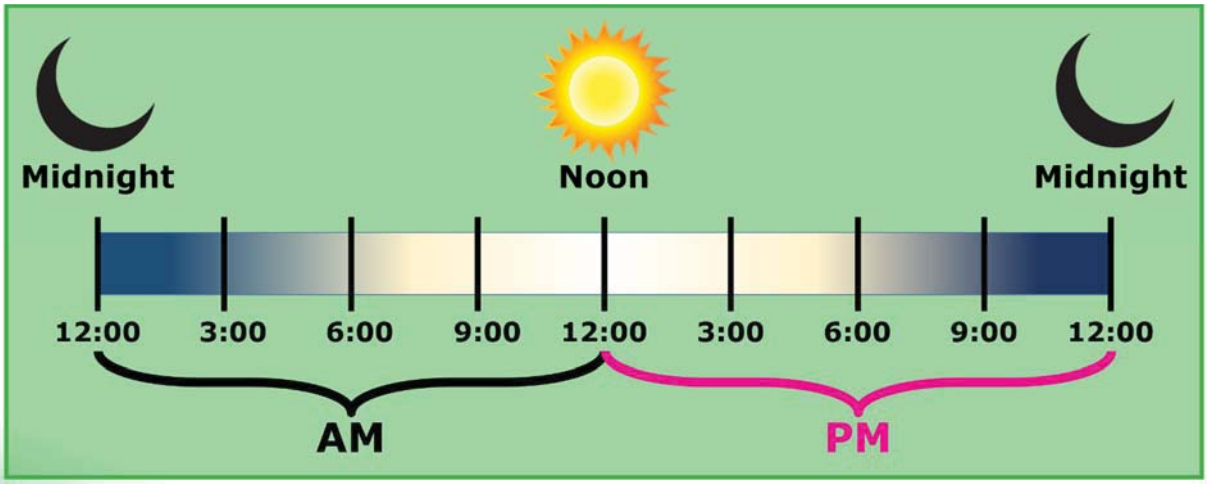
Some digital clocks use **AM / PM**. This tells you which part of the day it is.

Since there are 24 hours in a day and the clock only counts up to 12 it needs to count up to 12 twice every day.

**AM** time is from **12:00 midnight to 12:00 midday**. AM is the morning.

**PM** time is from **12:00 midday to 12:00 midnight**. PM is the afternoon and evening.

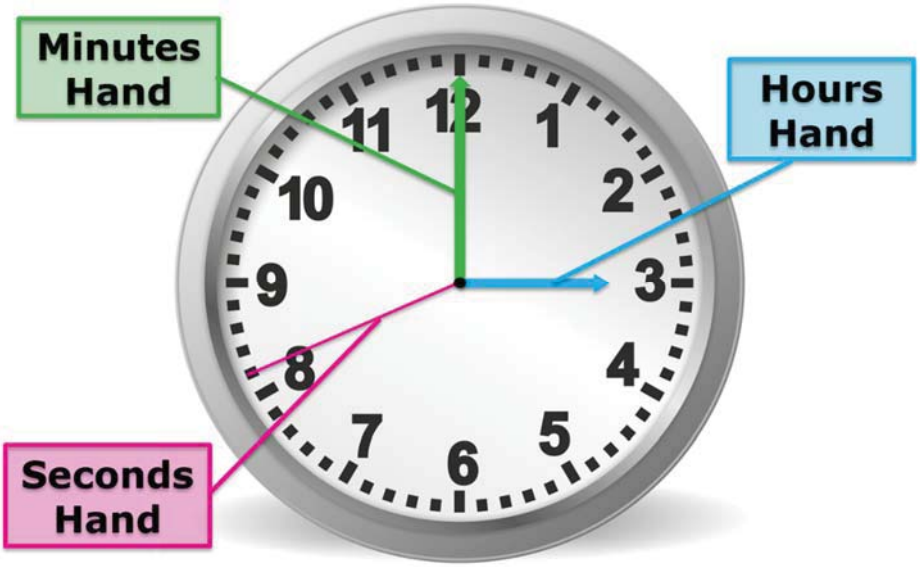
This means 1:00am is very late at night and 1:00pm is early afternoon.



## Analogue Clocks

Analogue clocks have hands that point to the time.

There are always **2 hands** on an analogue clock and sometimes 3 hands:




| | |
|---|---|
| **Hours Hand** | The short hand points to the hours. It takes 1 hour for the short hand to move to the next number and 12 hours to move all the way around the clock face. |
| **Minutes Hand** | The long hand points to the minutes. It takes 1 hour for the long hand to move all the way around the clock face. |
| **Seconds Hand** | Sometimes analogue clocks also have a long thin hand that counts the seconds. This is the seconds hand and it takes 1 minute to move all the way around the clock. |

The hands always move in the same direction. From the top of the clock they always turn to the right. This direction is called ‘clockwise’.


Clockwise is the same direction as turning a tap **OFF**.

## Activity 2.10

1. Which of these clocks reads 1:00? (Circle your answer)

a)  b)  c)  d) 

2. Which of these clocks reads 3:30? (Circle your answer)

a)  b)  c)  d 

3. Which of these clocks reads 11:00? (Circle your answer)

a)  b)  c)  d) 

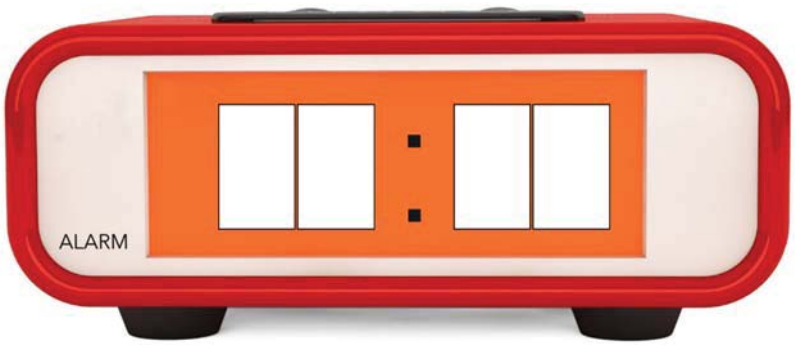
4. Draw 5:00 on the clocks:



5. Draw 2:30 on the clocks:



6. Draw 7:00 on the clocks:

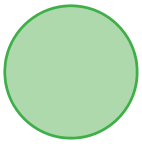
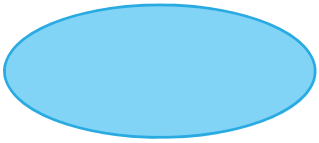
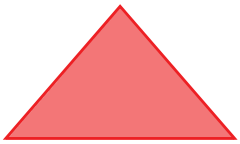
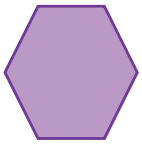
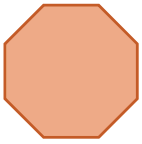



## Lesson 2.11 Shapes

There are shapes all around us.

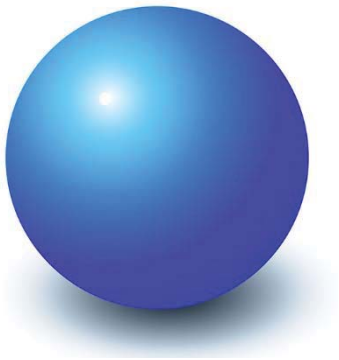
Simple shapes, called **2-Dimensional** (or 2D) are flat. This means they only have 2 dimensions that are length and width. They do not have any height or depth.

Here are some 2D shapes:

| | | |
|---|---|---|
| Circle |  | A perfectly round shape. |
| Oval |  | A stretched circle |
| Square |  | A shape with 4 sides that are all the same length |
| Rectangle |  | A shape with 4 sides, where 2 sides are longer and 2 sides are shorter |
| Triangle |  | A shape with 3 sides |
| Hexagon |  | A shape with 6 sides that are all the same length |
| Octagon |  | A shape with 8 sides that are all the same length |

**3-Dimensional** (or 3D) shapes are made up of length, width and height (or depth).

Here are some 3D shapes:

| | | |
|---|---|---|
| Sphere |  | A round object like a ball. |
| Cube |  | A 6 faced square where all sides are the same length, like a dice. |

## Activity 2.11

1. Match the name of the shape with the picture. Write the letters on the lines.

| | | |
|---|---|---|
| 1. _____ |  | a) Circle |
| 2. _____ |  | b) Oval |
| 3. _____ |  | c) Hexagon |
| 4. _____ |  | d) Rectangle |
| 5. _____ |  | e) Triangle |
| 6. _____ |  | f) Octagon |
| 7. _____ |  | g) Sphere |
| 8. _____ |  | h) Cube |

2. Draw the shapes:

| | |
|---|---|
| a) Circle | b) Triangle |
| c) Octagon | d) Square |

3. Name the shapes:

| | | | |
|---|---|---|---|
|  |  |  |  |
| a) | b) | c) | d) |

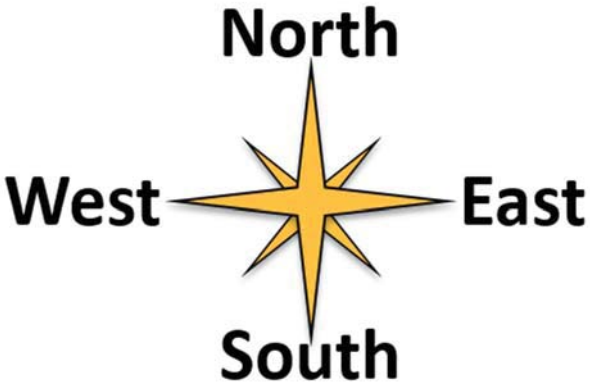
## Lesson 2.12 Maps and Navigation

### Compass Bearings

To make sense of maps it is important to know which direction you are supposed to be going.

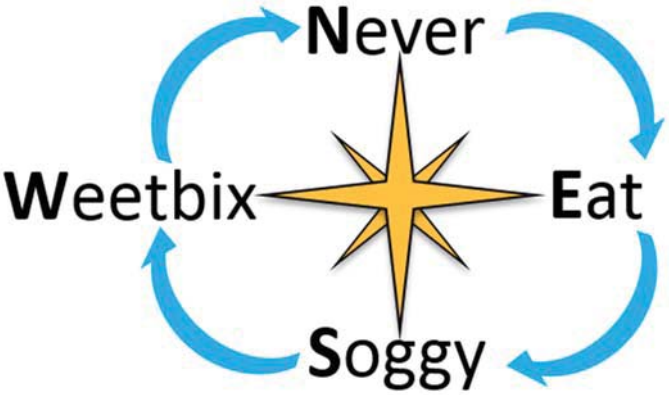
Maps use a **compass** to show you which **direction** you are going.

A compass is made up of 4 main points and looks like this:




You can remember which order the compass goes in my saying:

"**N**ever **E**at **S**oggy **W**eetbix"



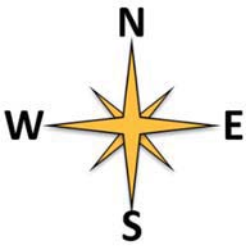
You can use compass bearings to give directions.

Imagine you are standing on the box marked with '**X**':

1. Take 3 steps North.
2. Take 1 step West.
3. Take 2 more steps North.
4. Take 5 steps East.
5. Take 1 step South.

Where did you end up?

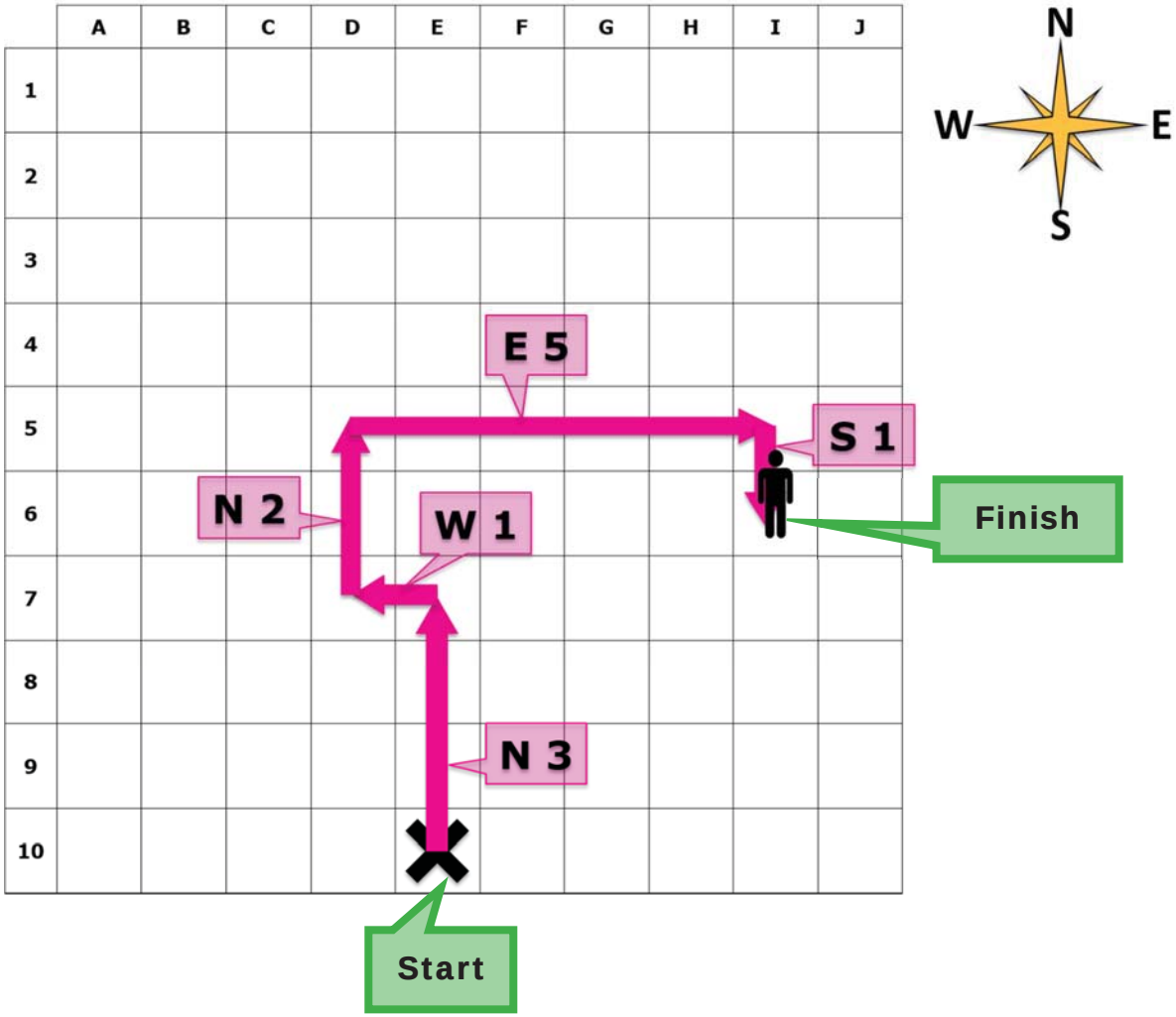
| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | X | | | | | |




Turn the page...

You were standing on the box marked with '**X**', you took:

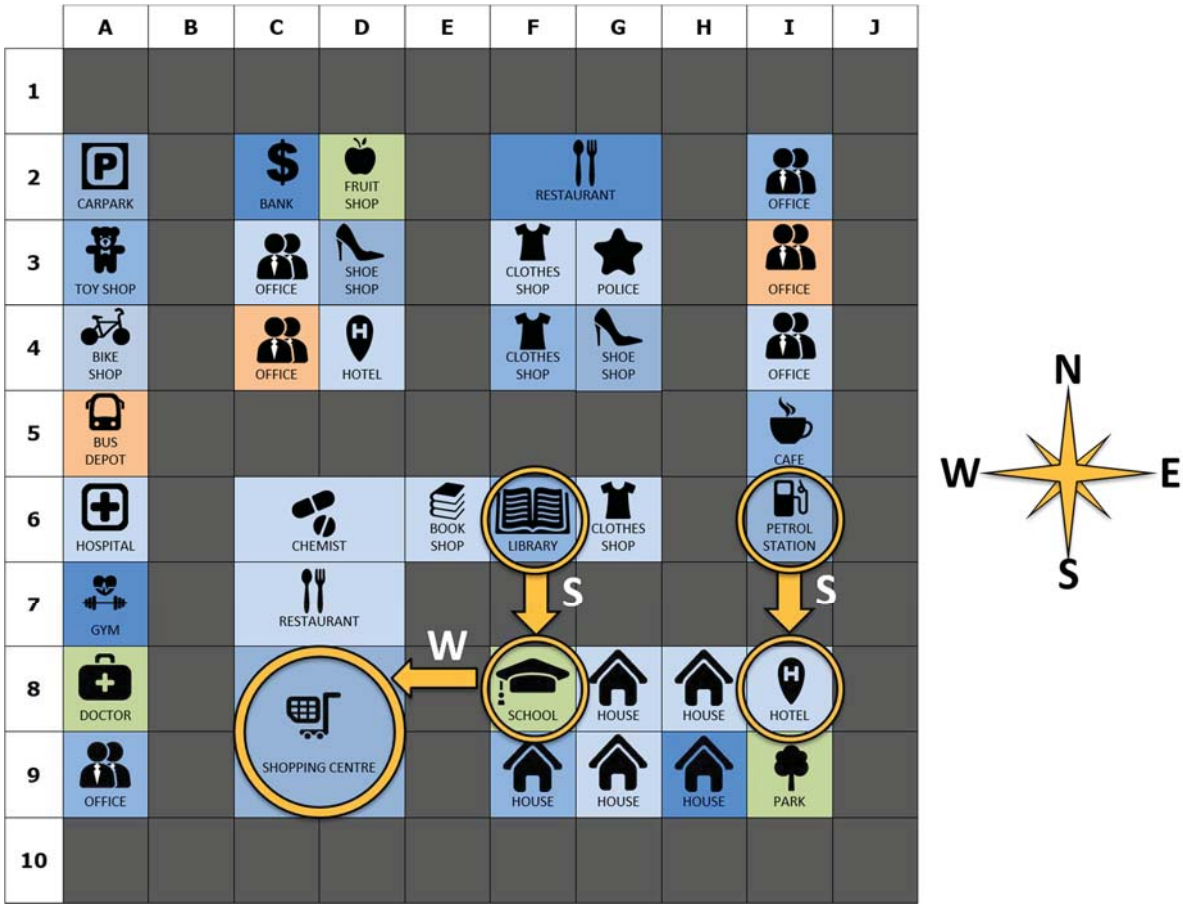
1. 3 steps North.
2. 1 step West.
3. 2 more steps North.
4. 5 steps East.
5. 1 step South.



You can also use the compass bearings to describe the position of one thing to another.

For example:

- The School is **south** of the Library.
- The Shopping Centre is **west** of the School.
- There is a Hotel **south** of the Petrol Station.



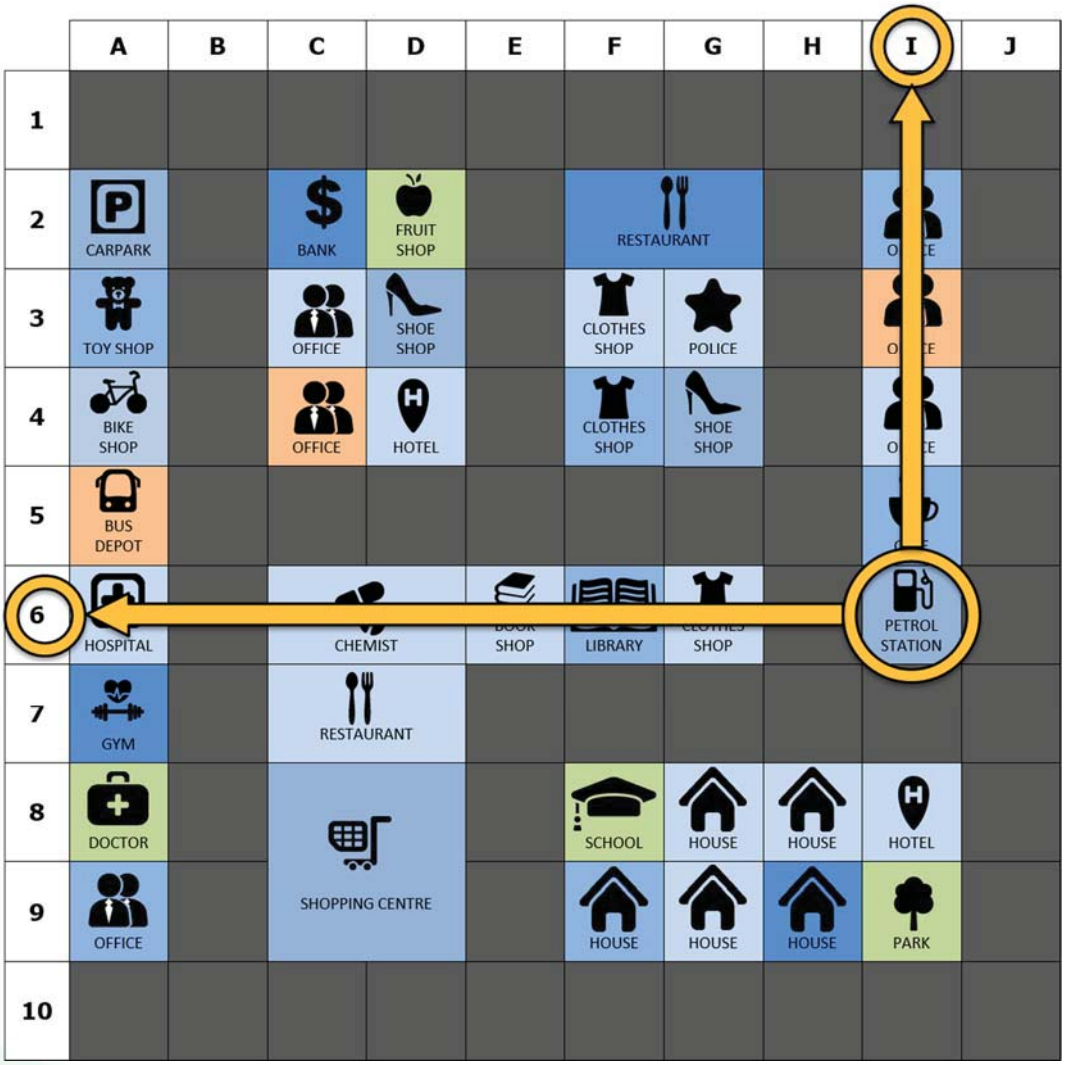
## Map Grids and Coordinates

Maps often use a grid to make it easier to find locations.

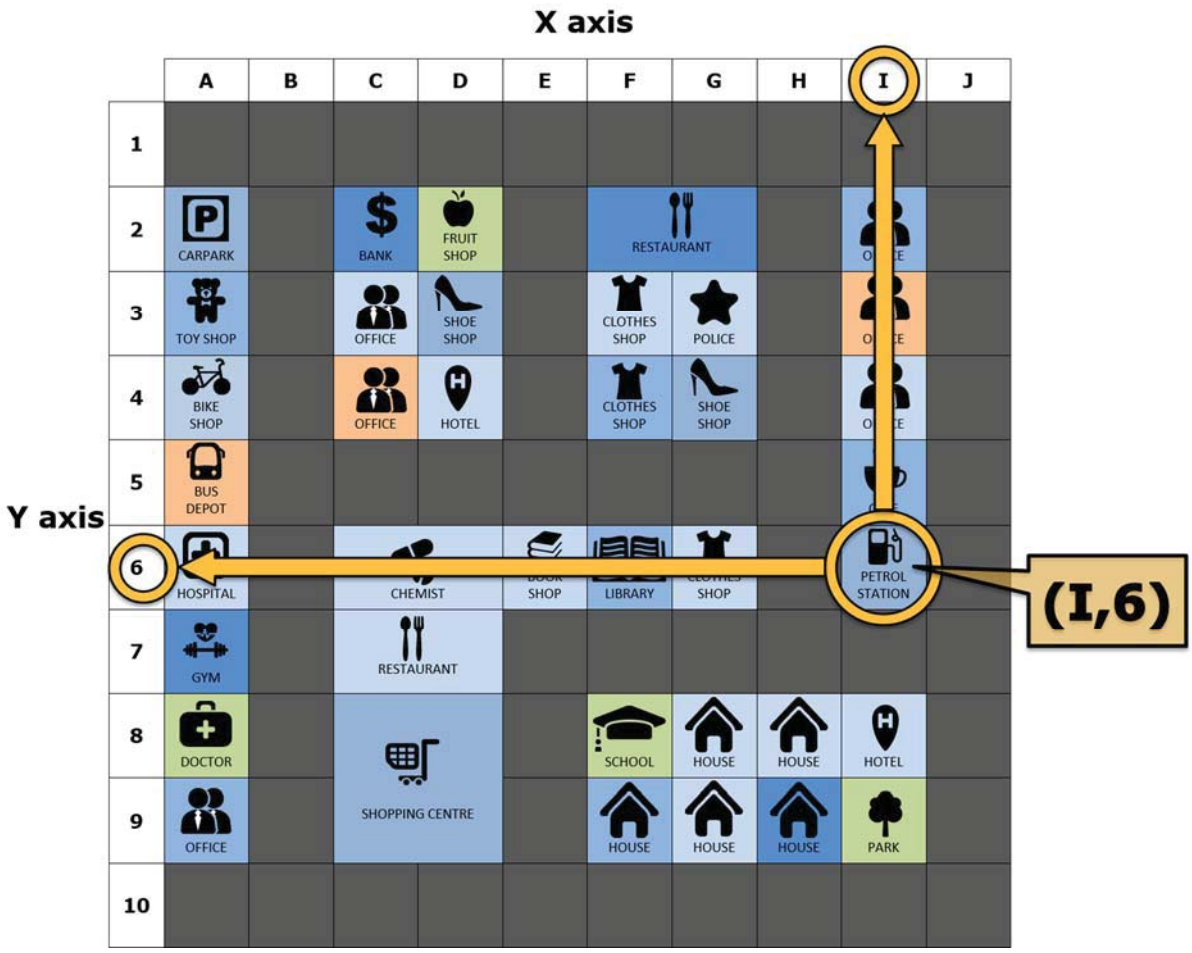
A street directory is a good example of this. Street directories use grid references to help you find the names of roads.

The way these grids work is to find where a row and a column meet. This point is called a **coordinate** (co-or-din-net).

Using the map here we can see that the petrol station is at the coordinates (I,6).



Coordinates are usually written inside brackets with the X axis first followed by a comma then the Y axis.




The **first part** of the coordinates is which **column** of the grid you should move along. These are marked with **letters**. This is known as the **'X axis'**. You can remember this because **X** is **A CROSS** and it moves **ACROSS** the page.

**(I,6)**

The **second part** of the coordinates is which **row** of the grid you need to move along. These are marked with **numbers**. This is known as the **'Y axis'**.

## Activity 2.12

1. Which of these compasses is correct? (Circle your answer)

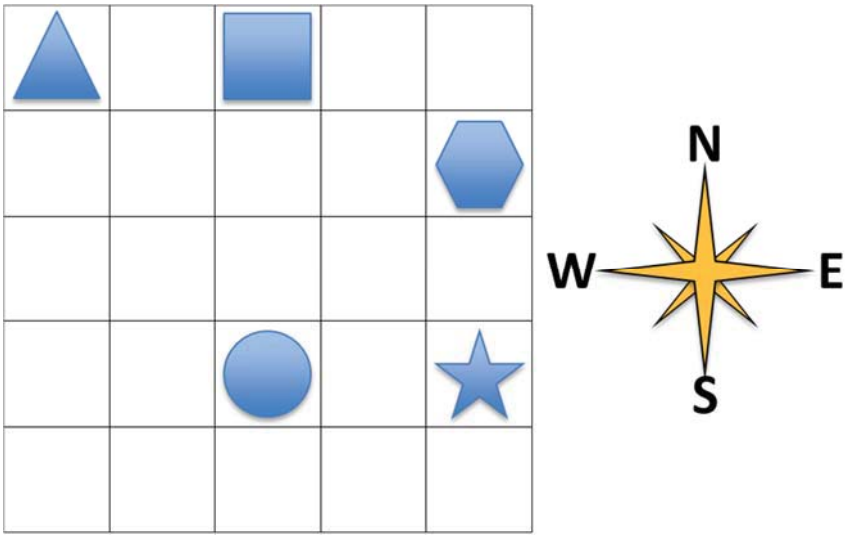
a) 


b) 


c) 


d) 


2. Fill in the blanks to make these statements true.




a) The circle is _____ of the square.

b) The triangle is _____ of the square.

c) The star is _____ of the circle.

d) The hexagon is _____ of the star.

3. Starting on the '**X**' follow the directions and mark the box you finish on.

**1.** Take 4 steps North.
**2.** Take 6 steps East.
**3.** Take 1 step North.
**4.** Take another step north.
**5.** Take 3 steps West.
**6.** Take 2 steps South.

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | X | | | | | | | | | |


What are the coordinates of the final box? (Circle your answer)

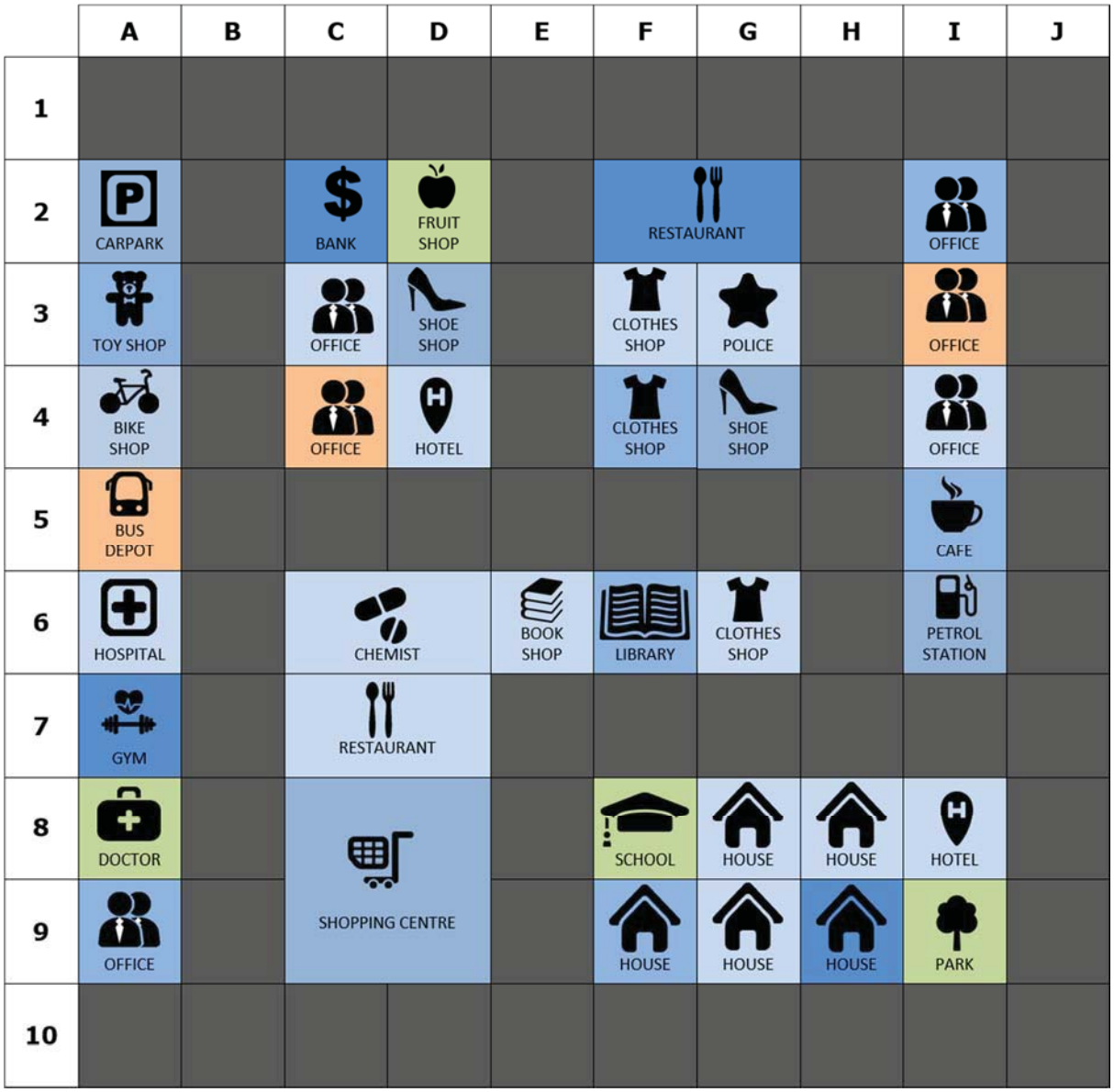
a) (C,6)

b) (D,6)

c) (C,5)

d) (E,5)

4. Write down the grid coordinates of each of the following landmarks or places on the map.




| | | | | | |
|---|---|---|---|---|---|
| | Hospital | a) | | School | b) |
| | Park | c) | | Police Station | d) |
| | Bank | e) | | Library | f) |