

## Goals



Goals for this week:

### Calculations

- ascertain the reasonableness of answers to arithmetic calculations (EMA03)
- use leading-digit approximation to obtain estimates of calculations (EMA04)
- use a calculator for multi-step calculations (EMA05)
- check results of calculations for accuracy (EMA06)

## Theoretical Components

### Resources:

*PDF file:* Week 3 Notes and Exercises

*YouTube Videos:* Linked in the PDF File

### Knowledge Checklist

(this lists all the concepts you should have done this week)

- Estimate length, weight, time, and other metrics
- Estimate the value of maths sums
- Round numbers to 10's, 100's, 1000's etc

### Order

1. Read through the notes and examples
2. Work through the exercises
3. Complete the Portfolio Task
4. Complete the reflection at the end of the booklet
5. Come and see your teacher and make sure you are up to date.

## Practical Components

There are 4 Exercises in this booklet. Read any notes and worked examples before you begin.

Try this estimation quiz (10 questions):

<https://www.mathsisfun.com/numbers/estimation.html>

If you haven't completed the work from last week, you need to complete it and hand it in.

**Remember to regularly check Google Classroom for messages.**

## Portfolio Task

Complete the task at the end of the brief and submit your weekly work for checking. 😊

**QFO**

Quiz/Forum/Other

Remember to check [hawkermaths.com](http://hawkermaths.com) for each week's learning brief.

Make sure you have joined Google Classroom. If you have not, see your teacher.



## ESSENTIAL MATHEMATICS 1

### WEEK 3 NOTES AND EXERCISES

#### How are we ever going to use this?

- Mentally estimating the amount we have to pay and the change we should receive.
- Estimating the total value of shopping to make sure we have sufficient funds to pay for it.
- Trades people use multiples frequently when they calculate material quantities

## ESTIMATION

We use estimation when we don't want to, don't need to, or can't get the exact answer. It has recently been proven in a research paper that grown adults use MORE ESTIMATION in everyday life, then they do EXACT answers.

Estimation is something you need to practise to get good at. Things we estimate often include cost, distance, temperature, length, weight, height, and time.

## EXERCISE 1

### **Money**

Imagine you go to the shops and buy the following items:

Box of cereal, 2L carton of milk and a loaf of bread.

How much do you think this will cost?

### **Distance**

How far do you think it is if you were to walk from the college to Hawker Shops and back?

### **Temperature**

How much hotter or colder than yesterday is it today?

### **Length**

How long do you think the whiteboard wall is in the Math Hub?

### **Mass**

How heavy do you think a Chromebook computer is?

### **Height**

How tall do you think your math teacher is? (Which teacher have you estimated?)

### **Time**

How long do you think it would take you to walk from the Maths staffroom over to the school gym?

## BIG AND LITTLE THINGS

### EXERCISE 2

a) The mass of this pumpkin in kilograms...



Guess:

Explain how you estimated this.

b) The mass of this giant onion...



Guess:

Explain how you estimated this.

c) The height of this giant carrot statue...



Guess:

Explain how you worked this out.....



d) The length of this watermelon float... (how did you do this?)

e) This is the world's smallest horse – how tall do you think it is?

The dog is 70cm tall.



f) Recently in Madagascar, a whole selection of miniature lizard species was discovered. This Chameleon lizard fits on the head of a match – how long do you think it is?



## ESTIMATION OF WRITTEN MATH PROBLEMS

Often a good way of estimating when doing problems in maths is to ROUND the numbers. Rounding can be done to round decimals off a calculator, you might ROUND UP to OVER-ESTIMATE, or ROUND DOWN to UNDER-ESTIMATE.

Intro video on rounding

<http://www.youtube.com/watch?v=Y7FekoVid54&list=PL4E3C90726B1F37F0>

Copy down the examples given in the video.

**Eg.1**

**Eg.2**

**Eg.3**

### EXERCISE 3

Play these games, a minimum of 5-10 minutes. You may choose the value to which you are rounding.

[http://www.softschools.com/math/practice/rounding\\_numbers.jsp](http://www.softschools.com/math/practice/rounding_numbers.jsp)

Write down five examples correctly rounded. 😊

Example – rounding to the nearest 100       $3,\underline{4}89 \approx 3,500$

- 1.
- 2.
- 3.
- 4.
- 5.

## ROUNDING

### EXERCISE 4

**Estimate** the value of these calculations, don't work out the exact answer. Indicate as you go if you think the EXACT answer will be MORE or LESS than the answer you have estimated.

#### Q1. Subtraction

Example:  $168 - 97$ .

Firstly, round and change the question to  $170 - 100$ , then we get the rounded answer of 70. The actual answer is greater than 70 (just!!)

a)  $91 - 47$

b)  $104 - 56$

c)  $1194 - 583$

d)  $23,770 - 14,789$

#### Q2. Addition

Example:  $168 + 97$

Firstly, round and change the question to  $170 + 100$ , then we get the rounded answer of 270. The actual answer is less than 270.

a)  $98 + 49$

b)  $105 + 68$

c)  $2105 + 901$

d)  $4287 + 4265$

**Q3. Multiplication****Example:**  $224 \times 3$ 

Firstly, round and change the question to  $200 \times 3$ , then we get the rounded answer of 600. The actual answer is greater than 600.

a)  $198 \times 5$

b)  $987 \times 43$

c)  $87 \times 39$

d)  $29 \times 5699$

e)  $99,987 \times 99$

**Q4. Division****Example:**  $285 \div 2$ 

Firstly, round and change the question to  $300 \div 2$ , then we get the rounded answer of 150. The actual answer is less than 150.

a)  $198 \div 5$

b)  $98 \div 51$

c)  $81 \div 39$

d)  $29,840 \div 3$

e)  $99,987 \div 99$

## WEEK 3 PORTFOLIO TASK

### Sports estimation

This table shows the percent of annual hospital visits due to sports injuries by males aged 15–19.

Percent of Male Sports-Related Injuries in the U.S.			
Sport	Percent	Sport	Percent
Basketball	25.9	Boxing, Wrestling	4.4
Football	21.3	Exercise	3.8
Baseball/softball	4.1	Bicycling	8.1
Soccer	4.6	Skateboarding	3.6

Write your answers to the following questions in the table, explaining for every question HOW you did it and the rounding you used.

<p><b>Q1.</b> Estimate the total percentage of hospital visits due to injuries in baseball/softball, exercising, skateboarding and boxing.</p>	<p><b>Q2.</b> About how many more visits were due to football injuries than soccer injuries?</p>
<p><b>Q3.</b> Lynne dribbled a basketball for 43 seconds before Greg got the ball away. Then Greg dribbled the ball for 11.525 seconds before Len got the ball. Use estimation to estimate how many more seconds Lynne dribbled the ball than Greg.</p>	<p><b>Q4.</b> Kevin completes a number of moves in a skateboard competition, the first was airborne for 3.42seconds, the second he was airborne for 1.85seconds and the third he was airborne for 2.49seconds. About how long in total was he airborne?</p>
<p><b>Q5.</b> Are there any injuries not accounted for in the above table? How do you know? What percentage if there are some unaccounted for?</p>	<p><b>Q6.</b> What combination of sports accounts for about 50% of all injuries to the hospital?</p>

## MARKING RUBRIC

CRITERIA	EXPECTATIONS	POSS	MULT	GIVEN	TOTAL
<b>Practical</b>	Student completes practical work of the brief to an acceptable standard set by the teacher.	<b>2</b>	<b>3</b>		<b>/6</b>
<b>Portfolio Task</b>	Student completes the portfolio task of the brief to an acceptable standard set by the teacher.	<b>2</b>	<b>2</b>		<b>/4</b>
<b>Communication and Reasoning</b>	Student responses are accurate and appropriate in presentation of mathematical ideas in different contexts, with clear and logical working out shown.	<b>4</b>	-		<b>/4</b>
<b>Knowledge and Application</b>	Student submitted work selects and applies appropriate mathematical modelling and problem solving techniques to solve practical problems, and demonstrates proficiency in the use of mathematical facts, techniques and formulae.	<b>4</b>	-		<b>/4</b>
	<b>Submission Guidelines</b>				
<b>Timeliness</b>	Student submits the exercises and portfolio task by the set deadline. See scoring guidelines for specific details.	<b>2</b>	-		<b>/2</b>
		<b>FINAL</b>			<b>/20</b>

**Student Reflection:**

How did you go with this week's work?

What was interesting?

What did you find easy?

What do you need to work on?