Week 3
Term 1
2021

HAWKER COLLEGE
Engage | Inspire | Achieve

EM1 Learning Brief: Calculations

Goals

Goals for this week:

- 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

STEP 1

Resources:
PDF file: Week 3 Notes and Exercises
YouTube Videos: Linked in the PDF File

This Week 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
(Don't know where to start… follow this order)

Step 1
Step 2
Step 3

Practical Components

STEP 2
Try the estimation quiz (10 questions) at the bottom of this page:
https://www.mathsisfun.com/numbers/estimation.html

There are 4 parts to complete from the Week 3 notes, then the final Investigation.

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

Investigation/Written Task

STEP 3

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

QFO

Quiz/Forum/Other

PART 1 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.

TRY THESE QUESTIONS – GIVE REASONS WHERE POSSSIBLE

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 the 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 learning commons?

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?)

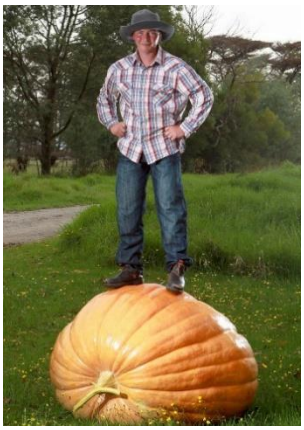
Time

How long do you think it would take you to walk from the Maths

staffroom over to the school gym?

PART 2 BIG AND LITTLE THINGS

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…

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 were discovered. This Chameleon lizard fits on the head of a match – how long do you think it is? 

PART 3 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.

PLAY THESE GAMES

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

Write down five examples correctly rounded😊

Example – rounding to the nearest 100 3,489 ≈ 3,500

PART 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.

QUESTION 1

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

QUESTION 2

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

QUESTION 3

Multiplication
Example: 224 x 3
Firstly, round and change the question to 200 x 3, then we get the rounded answer of 600. The actual answer is greater than 600.

a) 198 x 5

b) 987 x 43

c) 87 x 39

d) 29 x 5699

e) 99,987 x 99

QUESTION 4

Division
Example:285 ÷ 2
Firstly, round and change the question to 300 ÷ 2, then we get the rounded answer of 150. The actual answer is less than 150.

a) 198 ÷ 5

b) 98 ÷ 51

c) 81 ÷ 39

d) 29,840 ÷ 3

e) 99,987 ÷ 99

WEEK 3 PORTFOLIO TASK

SPORTS ESTIMATION

This table shows the percent of annual hospital visits due to sports injuries by males ages 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 these questions on the table, explaining for every question HOW you did it and the rounding you used.

Question 1 Estimate the total percentage of hospital visits due to injuries in baseball/softball, exercising, skateboarding and boxing.	**Question 2** About how many more visits were due to football injuries than soccer injuries?	**Question 3 – About basketball** 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.

Question 4 – about skateboarding 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?	**Question 5** Are there any injuries not accounted for in the above table? How do you know? What percentage if there are some unaccounted for?.	**Question 6** What combination of sports accounts for about 50% of all injuries to the hospital?

Marking Rubric **Week 3** **Name:**

CRITERIA	EXPECTATIONS	POSS	MULT	GIVEN	TOTAL
Practical	Student completes practical work, including exercises and Mathspace task, of the brief to an acceptable standard set by the teacher.	**2**	**3**		**/6**
Portfolio Task	Student completes the portfolio task of the brief to an acceptable standard set by the teacher.	**2**	**2**		**/4**
Reasoning and Communication	Student responses are accurate and appropriate in presentation of mathematical ideas in different contexts, with clear and logical working out shown.	**4**	**-**		**/4**
Concepts and Techniques	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.	**4**	**-**		**/4**
	Submission Guidelines				
Timeliness	Student submits the exercises, Mathspace task and portfolio by the set deadline. See scoring guidelines for specific details.	**2**	**-**		**/2**
				FINAL	**/20**

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?