Foundational Numeracy

MATH 1525

Property Values

Location:	River Valley, Edmonton, Alberta
Year Built:	2006
Listing Price (2016):	**$1,098,000**
Average Home Price (2016):	$364,004

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Property Values

Location:	Sunset Neighborhood, South Vancouver, BC
Year Built:	1947
Listing Price (2016):	**$999,000**
Average Home Price (2016; mainland Vancouver):	$891,705

Property Values

Location:	Yellowknife, NWT
Year Built:	2009
Listing Price (2016):	**$850,000**
Average Home Price (2016):	$308,310

Group Discussion
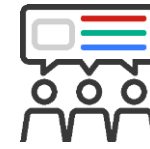
If you were hired to estimate the price of a home in Edmonton today, what kind of things would you consider in your estimate?

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Estimating and Rounding

• Estimating and Rounding are math strategies used for *approximating* a number

> **Estimate** (*verb*): to make a rough educated/calculated/meaningful guess, calculation, or observation

> **Round** (*verb*): to *simplify* a known number by scaling it slightly up or down. For convenience!

• Rounding is a form of estimating

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Estimating is part of our everyday existence...

- When you're shopping for groceries and trying to stay within a budget, you'd estimate the cost of the items you put in your cart to keep a running total in your head...

- When you're splitting the cost of dinner between 8 friends, we estimate for ease of payment...don't forget to tip!

- Contractors/Consultants often work in a word of estimates – rarely do we know the all the facts up front and there could be many variables at play... Ex) Valley line LRT (Millwoods to Downtown)

- When someone asks you how far the gym is from school, and you say "it's about a 10 minute walk THAT way"

- We might estimate how much milk to pour on our cereal so that it's covered but not enough to make it soggy

- How early do I have to leave for work so that I'm not late again?

- Deciding whether or not you think your car can fit into that parking space

- Deciding who will win tonight's hockey game

- **CAN YOU THINK OF ANY OTHERS?**

Nearly every minute of the day, we are estimating/approximating about
- **Numbers**
- **Physical Spaces**
- **Scenarios or Situations**

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Estimating…BUT WHY?!?!

Estimating allows us to

- Make informed decisions
- Check if the answer we've arrived at is "**reasonable**"… does it make *sense* in context?
    - If it doesn't seem reasonable, check your observations again!

Which one is Reasonable?

Connor McDavid skates at a top speed of **409 km/hr**

Connor McDavid skates at a top speed of **40.9 km/hr**

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Which one is Reasonable?

L.A. Nissan Dealership is selling
this used minivan for **$13,995**

2014 Dodge Grand Caravan SXT 3rd Row, Bluetooth, A/C,

. . . 3.6 L 6 CYL ENGINE VEHICLE OPTIONS : SEVEN PASSENGER SEATING, STOW 'N' GO SEATING, BLUETOOTH, AIR CONDITIONING, CRUISE CONTROL, POWER WINDOWS, POWER LOCKS, TILT STEERING, TEXT US 780-769-...

Mileage 77,849 km

Dealer Price

$

L.A. NISSAN

★★★★★
powered by Google

In Leduc, 30 km

L.A. Nissan Dealership is selling
this used minivan for **$139,995**

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- Mitch Hedberg (comedian)

Let's play a game!

How many jellybeans are in this jar?

DISCUSS: What strategies did you use to form your answer?

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Estimating is Always Part of the Process!

Everybody has their own process for determining/estimating how many jellybeans are in the jar

Estimating processes are similar across mathematics & everyday numeracy

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The People of Foundational Literacy:
Raeleene McKenzie McMurray-Prescott

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Raeleene holds a yearly fundraiser for a local animal shelter. While being interviewed on the local news as a guest to promote her continuing campaign, the news reporter asks,

"Looks like you've had a decent start in your fundraising campaign this year, Raeleene. About how much money would you say your team has already taken in?"

At this point, Raeleene knows that she is not being asked to provide an <u>exact</u> amount

She is being asked to provide an estimate

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The People of Foundational Literacy:
Raeleene McKenzie McMurray-Prescott

"Looks like you've had a decent start in your fundraising campaign this year, Raeleene. About how much money would you say your team has already taken in?"

Raeleene recalls the recent accounting report of her fundraising campaign

The exact amount of fundraising so far is totaled at $**9,376**

How will estimating/rounding help her form a response?

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Estimating by Rounding

- One way to estimate numbers is by **rounding**
  - **Round** (*verb*): to *simplify* a known number by scaling it slightly up or down. **For convenience!**
- We **round** numbers by **place value**

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:												

Estimating by Rounding

Hundreds   Tens

Thousands   Ones

9,376
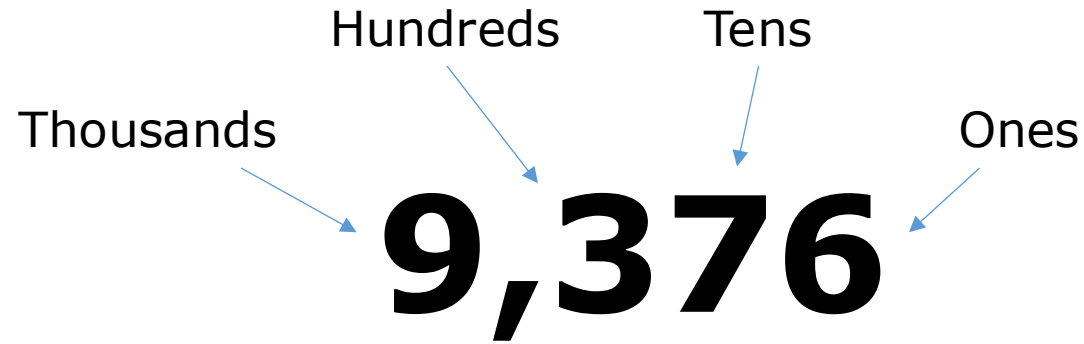
1. Identify which place value you are rounding to; this is the target (⬆) place value

2. Look to the next smallest place value (the number to the RIGHT of your target)

      If this digit is less than 5 (being 0, 1, 2, 3, 4), leave your target digit as is

      If this digit is 5 or more (being 5, 6, 7, 8, 9), increase the value of the digit you are rounding to by 1

3. Any digits to the right of your target become 0's

Rounding to the Nearest THOUSAND

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:									9	3	7	6

1. Identify which place value you are rounding to; this is your target

2. Look to the next smallest place value (the number to the RIGHT of your target)

    If this digit is less than 5 (being 0, 1, 2, 3, 4), leave your target digit as is

    If this digit is 5 or more (being 5, 6, 7, 8, 9), increase the value of the digit you are rounding to by 1

3. All digits to the right of your target become 0's

= 9,000

Rounding to the Nearest HUNDRED

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:									9	3	7	6

1. Identify which place value you are rounding to; this is your target ⬆

2. Look to the next smallest place value (the number to the RIGHT of your target)

    If this digit is less than 5 (being 0, 1, 2, 3, 4), leave your target digit as is

    If this digit is 5 or more (being 5, 6, 7, 8, 9), increase the value of your target digit by 1

3. All digits to the right of your target become 0's

= 9,400

Rounding to the Nearest TEN

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:									9	3	7	6

1. Identify which place value you are rounding to; this is your target

2. Look to the next smallest place value (the number to the RIGHT of your target)

   If this digit is less than 5 (being 0, 1, 2, 3, 4), leave your target digit as is

   If this digit is 5 or more (being 5, 6, 7, 8, 9), increase the value of your target digit by 1

3. All digits to the right of your target become 0's

= **9,380**

The People of Foundational Literacy:
Raeleene McKenzie McMurray-Prescott

"Looks like you've had a decent start in your fundraising campaign this year, Raeleene. About how much money would you say your team has already taken in?"

9,376

After doing some quick math in her head, **Raeleene** has several options for a response for the above question:

- She can **round** to the nearest **thousand**: "We've raised about $**9,000**"

- She can **round** to the nearest **hundred**: "We've raised about $**9,400**"

- She can **round** to the nearest **ten**: "We've raised about $**9,380**"

Are there any other **reasonable** responses to this question?   "We've raised almost $**10,000**"

Rounding - Practice

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:							1	3	6	5	2	9

Round $136,529$ to the nearest

Hundred Thousand:

Ten Thousand:

Thousand:

Hundred:

Ten:

Rounding - Practice

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:							1	3	6	5	2	9

Round **136, 529** to the nearest

Hundred Thousand: 100, 000

Ten Thousand:

Thousand:

Hundred:

Ten:

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Rounding - Practice

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:							1	3	6	5	2	9

Round **136,529** to the nearest

Hundred Thousand: 100,000

Ten Thousand: 140,000

Thousand:

Hundred:

Ten:

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Rounding - Practice

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:							1	3	6	5	2	9

Round **136,529** to the nearest

Hundred Thousand:	100,000
Ten Thousand:	140,000
Thousand:	137,000
Hundred:	
Ten:	

Rounding - Practice

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:							1	3	6	5	2	9

Round **136,529** to the nearest

Hundred Thousand: 100,000

Ten Thousand: 140,000

Thousand: 137,000

Hundred: 136,500

Ten:

Rounding - Practice

Periods:	Billions			Millions			Thousands			Ones		
PLACE VALUE:	Hundred-billions	Ten-billions	Billions	Hundred-millions	Ten-millions	Millions	Hundred-thousands	Ten-Thousands	Thousands	Hundreds	Tens	Ones
Example:							1	3	6	5	2	9

Round **136,529** to the nearest

Hundred Thousand: 100,000

Ten Thousand: 140,000

Thousand: 137,000

Hundred: 136,500

Ten: 136,530

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Front-End Rounding

Front-End Rounding is a process that rounds a number based on its *greatest* place value

- Round whatever number is in *front*

- The front number is always your target place value ⬆ in front end rounding

Example #1:

<u>3</u>78,000
⬆

- Front Number: 3 (in the **hundred thousands** place value)

- So, round to the nearest **hundred thousand**

⬇

400,000

Example #2:

<u>2</u>,350,000
⬆

- Front Number: 2 (in the **millions** place value)

- So, round to the nearest **million**

⬇

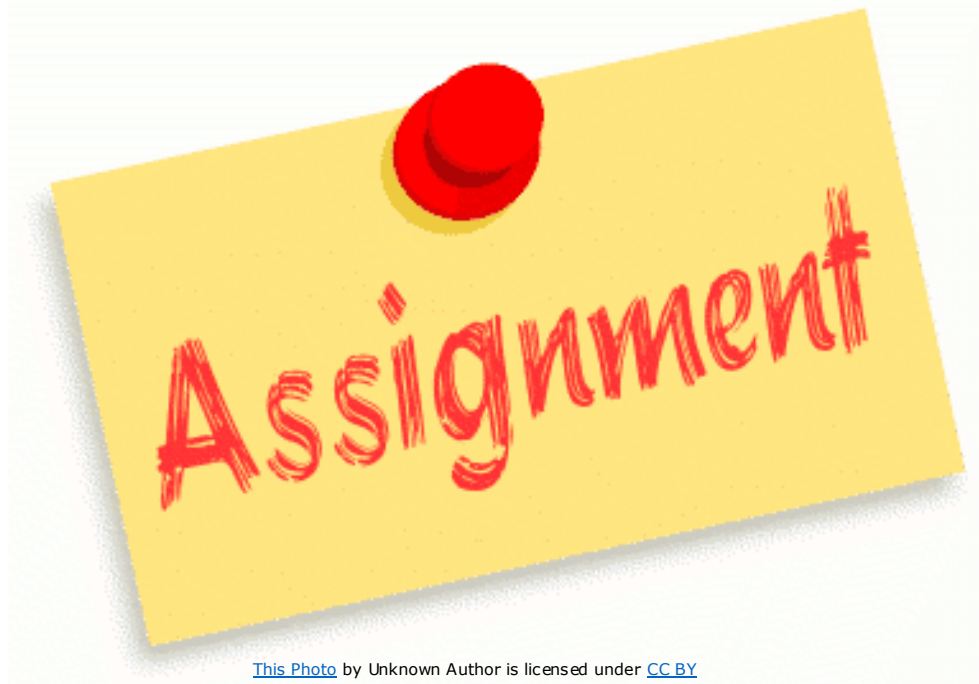## 2,000,000

Assignment #2

1. Create an 8 digit number

_ _ / _ _ _ / _ _ _

- Cannot repeat digits
- Cannot use 0 in the front

2. Round your number to the nearest

- Ten Million:
- Million:
- Hundred Thousand:
- Ten Thousand:
- Thousand:
- Hundred:
- Ten:

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