Burnaby North Numeracy Practice Session

Thursday, January 23, 2020

Agenda

- What is the Numeracy Assessment?
- Evaluation Rubric
- Sample Question 1: Water Usage
- Looking at Student Exemplars & Marking Your Own Solutions
- Sample Question 2: Video Game Company
- Discussion on Strategies
- Resources, Q & A

What is Numeracy?

"The recipe said to cook at 350 degrees for one hour. Now, I'm no math whiz -- but that's the same as 700 degrees for thirty minutes, right?"

The Numeracy Assessment

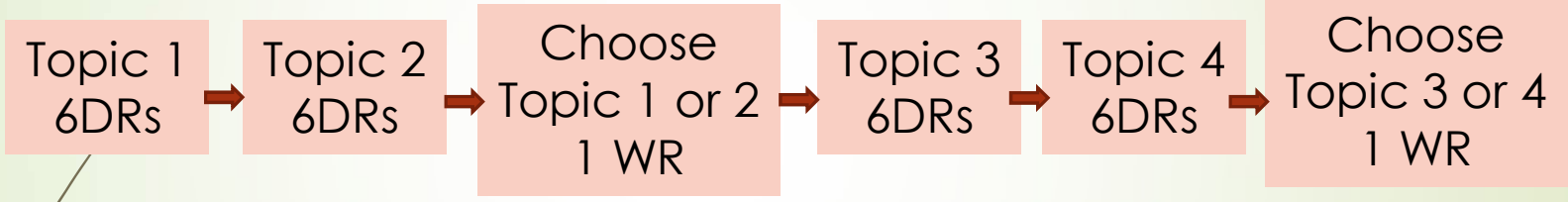
- The **Graduation Numeracy Assessment** is based on mathematical concepts learned across multiple subjects... with an emphasis on K–9.
- It is **NOT** a math exam! You don't need to know the quadratic formula or cosine law for this!
- You will **ALL** write **during a week in January 2021** (You will be assigned a day/time.)

The Numeracy Assessment

- This assessment is **REQUIRED TO GRADUATE**; it is NOT OPTIONAL.
- If you do not like your score, you have 2 more chances to write it (a total of 3 tries).
- You will have 2 hours plus an additional hour, for a total of **3 hours**.
- Digital response questions are done on computer; Written response questions are done on paper.
- Four topic types:
  - **Fair-Share –** Decide how to best share something fairly (ex. Giving out bonuses)
  - **Planning** – Analyze time, space, cost, and people in order to make a recommendation (ex. Shipping stuff)
  - **Estimation** – Make or use estimates to build a logical argument for a possible solution (ex. Best way to travel to Australia given certain parameters)
  - **Modelling** – Come up with a model or strategy given a data set, then apply this model or strategy to a new data set, and if necessary, refine your model (ex. Ranking criteria)

The Numeracy Assessment

- Format: There are a total of 24 digital responses and 2 written responses.



6DRs + 6DRs + 1WR + 6DRs + 6DRs + 1WR

= 24DRs + 2 WRs

(Here is the catch. Once you make a WR choice you can't go back!)

Evaluation Rubric

Scoring Rubric (Constructed Response)

Snapshot

4	Student demonstrates an extensive understanding of the situation. The approach is effective and comprehensive. The solution is supported by relevant evidence, and any errors are minor and do not hinder the solution's reasonableness within context. The reasoning is clearly communicated and references all pertinent aspects of the problem.
3	Student demonstrates a strong understanding of the situation. The approach is sensible. The solution fully addresses critical aspects of the problem; minor mathematical errors may exist. The reasoning is clearly communicated and references most pertinent aspects of the problem.
2	Student demonstrates a basic understanding of the situation. The approach may be unclear and/or incomplete but is on the right track. The solution may contain mathematical errors. The reasoning may be unclear but aligns with certain aspects of the problem.
1	Student demonstrates a limited understanding of the situation. The approach is ineffective or leaves out critical aspects needed to resolve the problem. The solution may contain fundamental mathematical errors. The reasoning is missing or irrelevant.
0*	Student work described by one of the following statements: • *Information simply recopied from the problem.* • *Diagrams or calculations are unrelated to the problem.* • *Any answer without supporting work.* • *Response does not address the purpose of the task.* • *Inappropriate response (contains profanity, inappropriate diagram or language).* • *All work is erased or crossed out.*
NR	No response (answer sheet is blank)

** Any zero score must include rationale and be approved by the section head.*

Sample Question 1: Water Usage

Rules | Instructions | References | Questions | Review/Index

1. Which of the following communities uses on average between 250 and 450 L/person/day of water?

Select all that apply.

- [x] Whistler
- [ ] Vancouver
- [x] Port Alberni
- [ ] Prince George

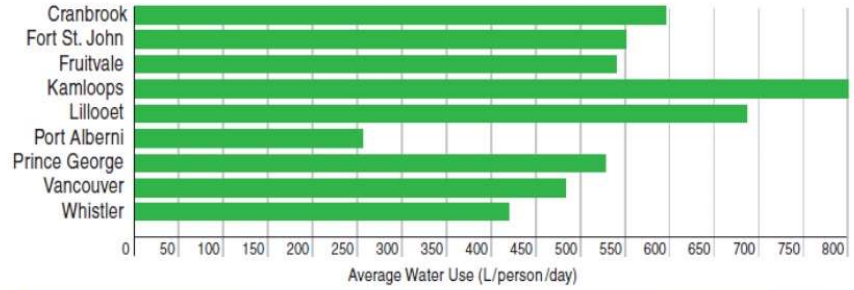
Sample Student | Back | Next

A newspaper headline grabs your attention.

DAILY NEWS

Water use skyrockets

Recent studies have predicted water shortages.



Indoor Water Use with Conventional Appliances and Fixtures

Toilet	13 L/flush	Tap	8 L/minute
Shower	10 L/minute	Dishwasher	40 L/cycle
Bath	100 L/bath	Leaks	3 L/day
Clothes Washer	150 L/cycle		

Sample Question 1: Water Usage

Rules | Instructions | References | Questions | Review/Index

This question is to be answered on paper.

13. You want to reduce your personal water use to 1050 L/week. You install high-efficiency appliances and fixtures, and change your water-use habits.

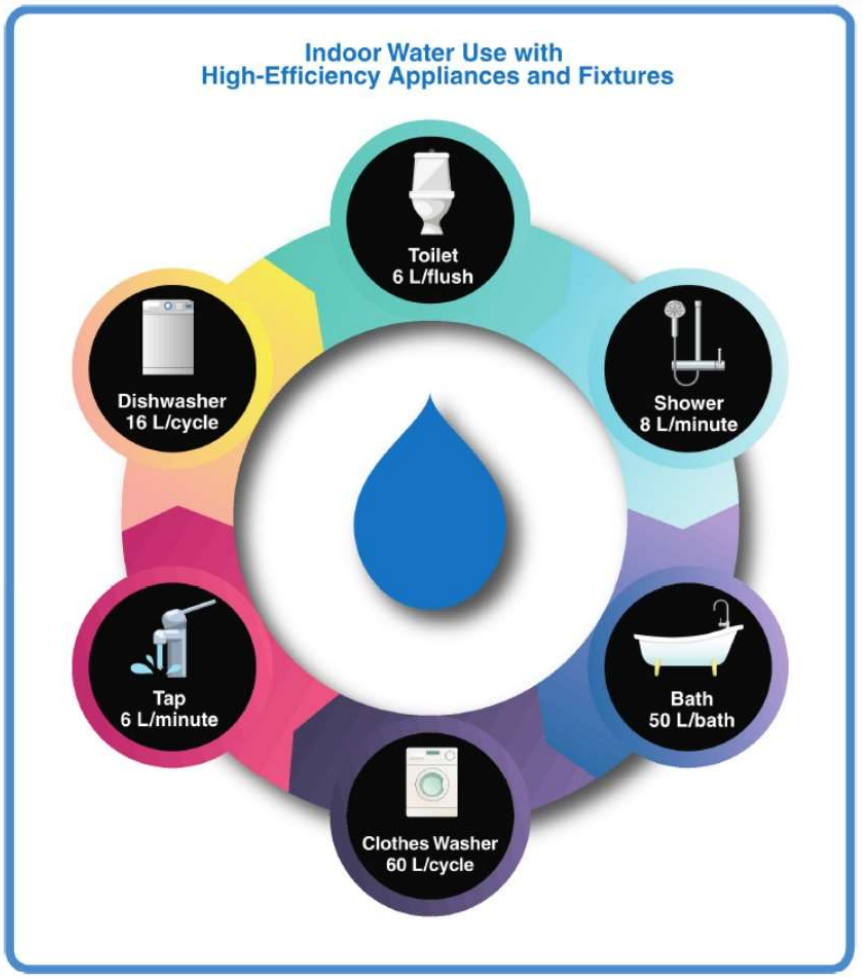
Plan a water budget for yourself for 1 week that meets this goal using the high-efficiency appliances and fixtures.

Explain and justify your solution.

You must use everything in the table below at least once in the week.

High-efficiency Appliances and Fixtures
Shower and/or bath
Toilet
Tap
Dishwasher
Clothes Washer

Next



Sample Question 1: Water Usage

Now try this question **on your own** first.
Remember to **SHOW YOUR WORK**!!!
Explain and justify your solution.

You may ask the teachers if you need clarifications.

Sample Question 1: Water Usage

There are many possible solutions; a couple of solutions are given.

Solution 1

Daily Water Usage

Activity/Appliance	Daily Usage	Total	Explanation
Shower	5 min/day 5 × 8 L/min = 40 L	40 L	One quick shower per day is all that is needed
Toilet	3 flushes/day 3 × 6 L = 18 L	18 L	Assuming you work or go to school during the day you only average using the toilet 3×/day
Tap	10 min/day 10 × 6 L/min = 60 L	60 L	After using washroom, and once for dishes that can't go in dishwasher
Dishwasher	Once every second day	8L	One load of dishes per two days
Clothes Washer	Two loads/week (/7)	17 L	Only use a light and dark load per week
TOTAL		143 L/day	

143 L/day × 7 days = 1001 L for the week, which is under the limit of 1050 L per week.

Sample Question 1: Water Usage

Solution 2

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Shower/ bath	5 min shower 5 min × 8 L/min = 40 L	5 min shower 5 min × 8 L/min = 40 L	5 min shower 5 min × 8 L/min = 40 L	5 min shower 5 min × 8 L/min = 40 L	5 min shower 5 min × 8 L/min = 40 L	5 min shower 5 min × 8 L/min = 40 L	5 min shower 5 min × 8 L/min = 40 L
Toilet	3 × 6 L = 18 L	3 × 6 L = 18 L	3 × 6 L = 18 L	3 × 6 L = 18 L	3 × 6 L = 18 L	5 × 6 L = 30 L	5 × 6 L = 30 L
Tap	8 min × 6 L/min = 48 L	10 min × 6 L/min = 60 L	8 min × 6 L/min = 48 L	10 min × 6 L/min = 60 L	8 min × 6 L/min = 48 L	10 min × 6 L/min = 60 L	8 min × 6 L/min = 48 L
Dishwasher	1 × 16 L = 16 L		1 × 16 L = 16 L		1 × 16 L = 16 L		1 × 16 L = 16 L
Clothes washer		1 cycle = 60 L				1 cycle = 60 L	
Total	**122L**	**178L**	**122L**	**118L**	**122L**	**190L**	**134L**

Weekly total: 122 + 178 + 122 + 118 + 122+ 190 + 134 = 986 L
Weekly total is 986 L which is well under the total of 1050 L per week needed. This leaves room for any unexpected water usage.

Showers were taken daily. Toilet usage was increased on the weekend as I would not be using the facility at school as I do during the week.

The dishwasher is used every second day, so on the days it doesn't run there are an extra 2 minutes of tap usage to accommodate having to wash a couple of dishes by hand.

Two loads of clothes washing per week are enough to have one load of lights and one load of darks.

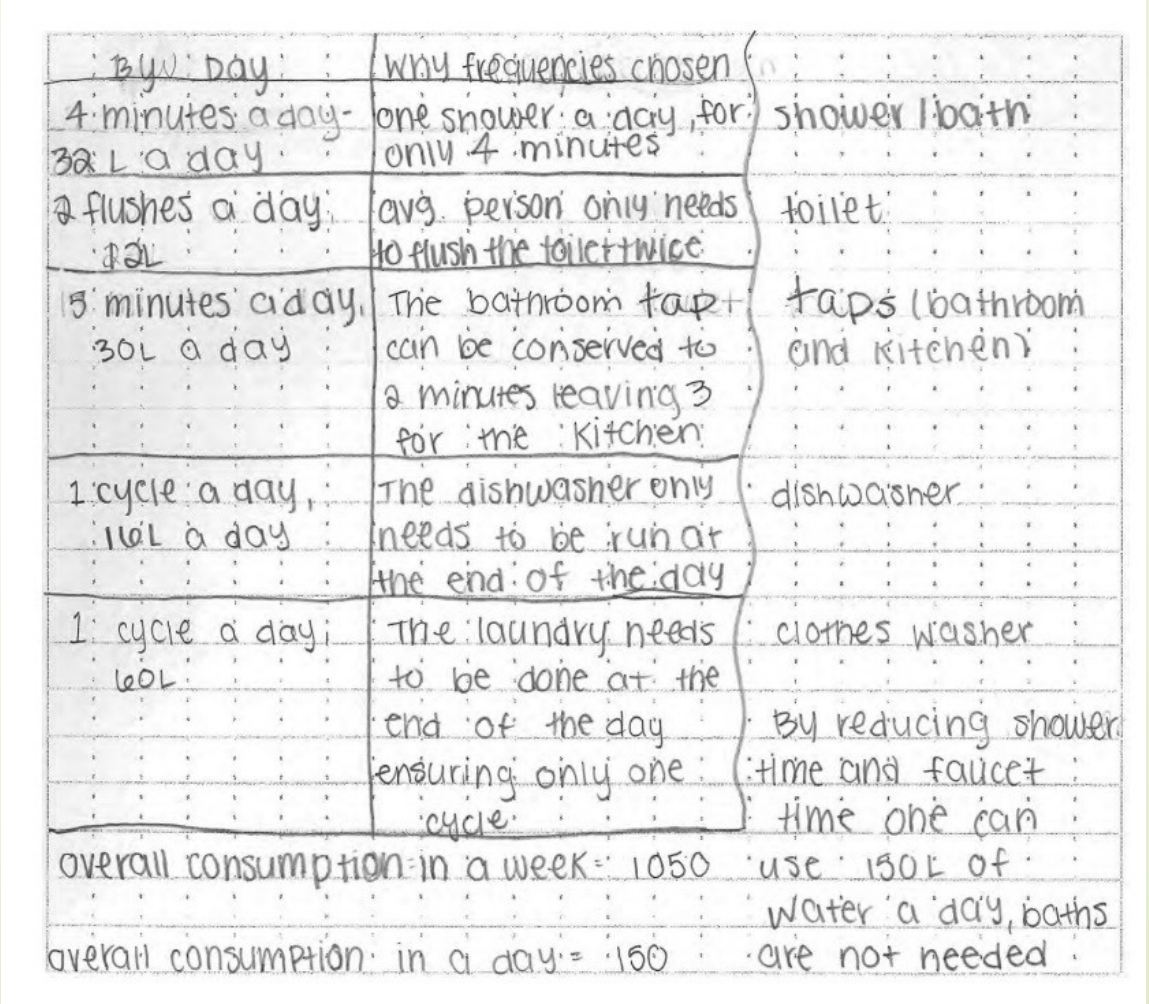
This keeps the water usage under the limit of 1050 L per week.

Sample Question 1: Water Usage

Now we will look at 4 sample student responses. Guess what these students scored on this question, using the 4-point evaluation rubric.

Sample Question 1: Water Usage

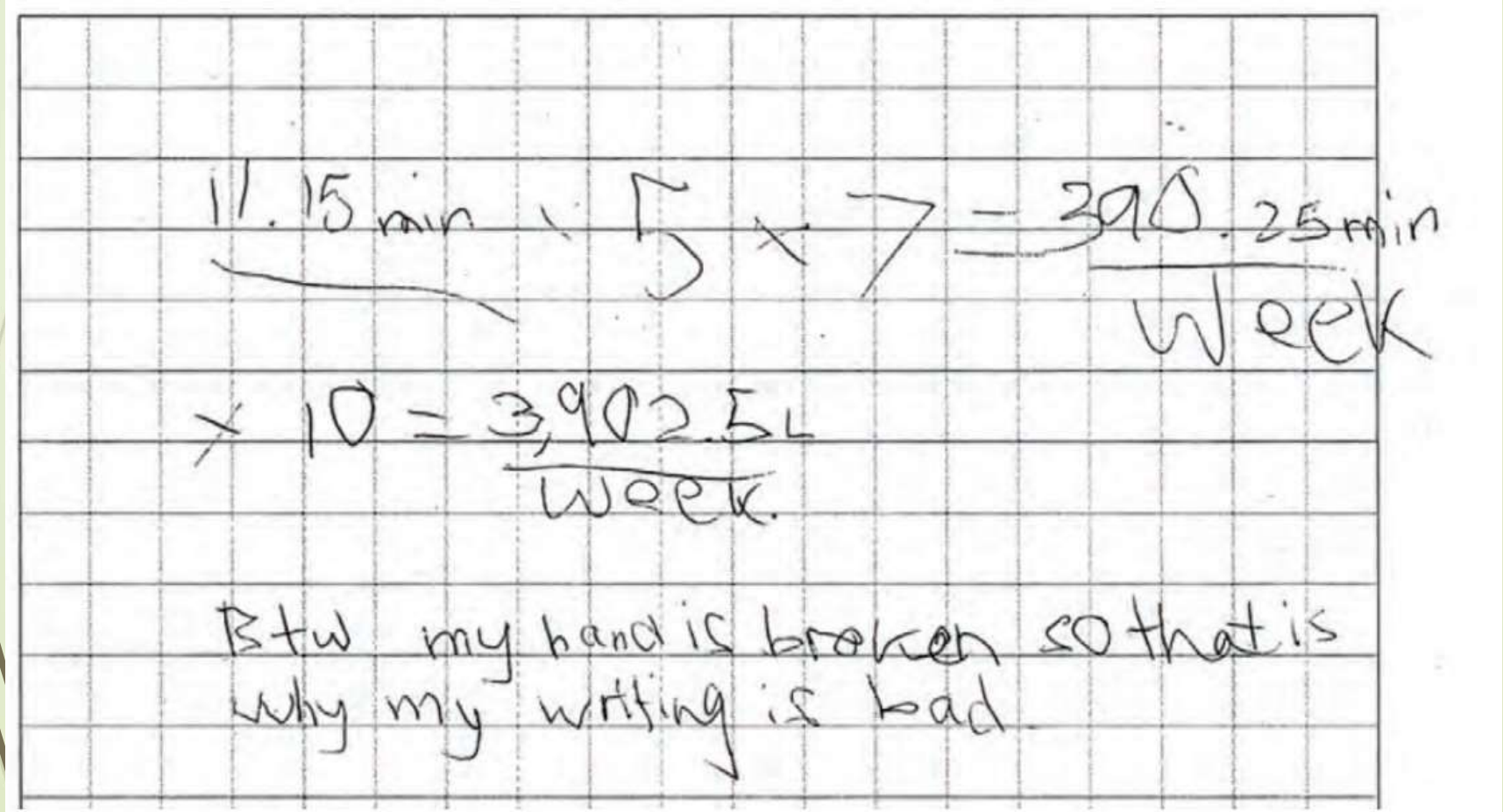
Student 1: Ada



B/W Day	Why frequencies chosen	
4 minutes a day- 32 L a day	one shower a day, for only 4 minutes	shower / bath
2 flushes a day; 12L	avg. person only needs to flush the toilet twice	toilet
5 minutes a day, 30L a day	The bathroom tap+ can be conserved to 2 minutes leaving 3 for the kitchen	taps (bathroom and kitchen)
1 cycle a day, 16L a day	The dishwasher only needs to be run at the end of the day	dishwasher
1 cycle a day; 60L	The laundry needs to be done at the end of the day ensuring only one cycle	clothes washer
overall consumption in a week = 1050		By reducing shower time and faucet time one can use 150L of water a day, baths are not needed
overall consumption in a day = 150		

Sample Question 1: Water Usage

Student 2: Blair



Sample Question 1: Water Usage

Student 3: Carl

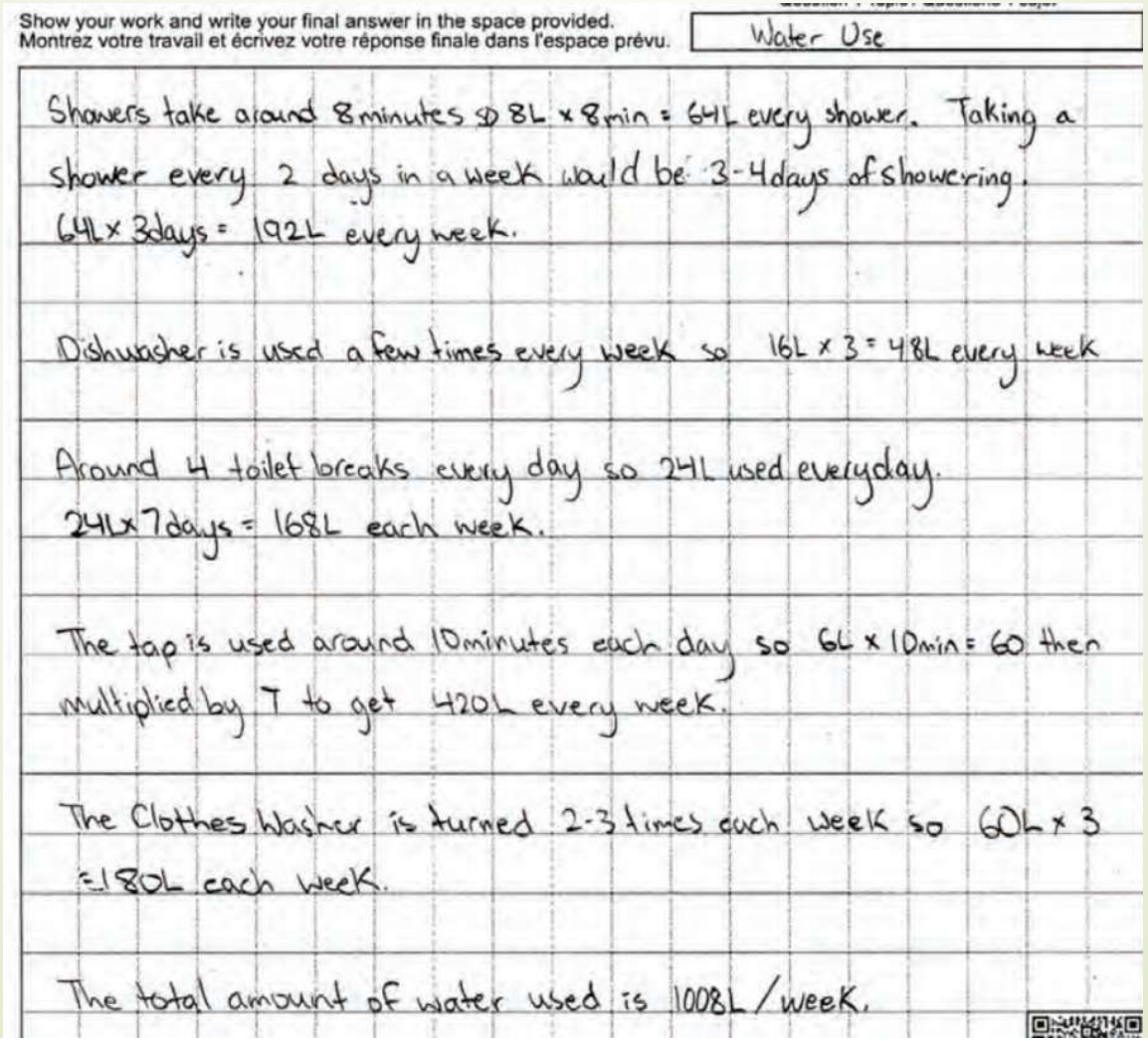
Show your work and write your final answer in the space provided.
Montrez votre travail et écrivez votre réponse finale dans l'espace prévu.

Water Use

13.	Shower	7 times a week	This comes well under
	Toilet	25 times a week	the budget even we aren't
	Tap	40 times a week	
	Dishwasher	5 times a week	using these resources too
	Clothes Washer	5 times a week	frugantly. You can take
			a shower a day and
			run the dishwasher
			when full.

Sample Question 1: Water Usage

Student 4: Dino



Show your work and write your final answer in the space provided.
Montrez votre travail et écrivez votre réponse finale dans l'espace prévu.

Water Use

Showers take around 8minutes so 8L x 8min = 64L every shower. Taking a shower every 2 days in a week would be 3-4days of showering.
64L x 3days = 192L every week.

Dishwasher is used a few times every week so 16L x 3 = 48L every week

Around 4 toilet breaks every day so 24L used everyday.
24Lx7days = 168L each week.

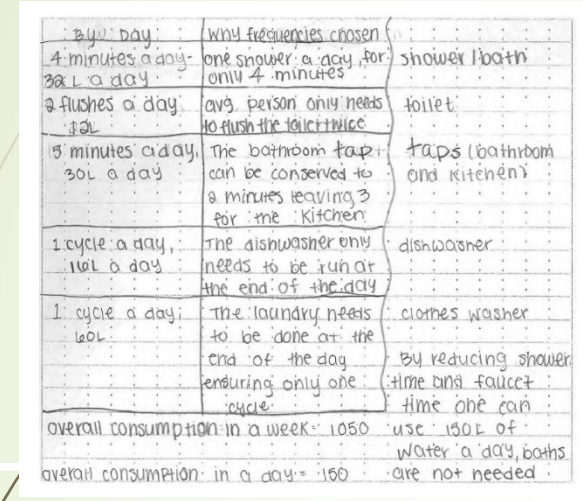
The tap is used around 10minutes each day so 6L x 10min = 60 then multiplied by 7 to get 420L every week.

The Clothes Washer is turned 2-3 times each week so 60L x 3 =180L each week.

The total amount of water used is 1008L/week.

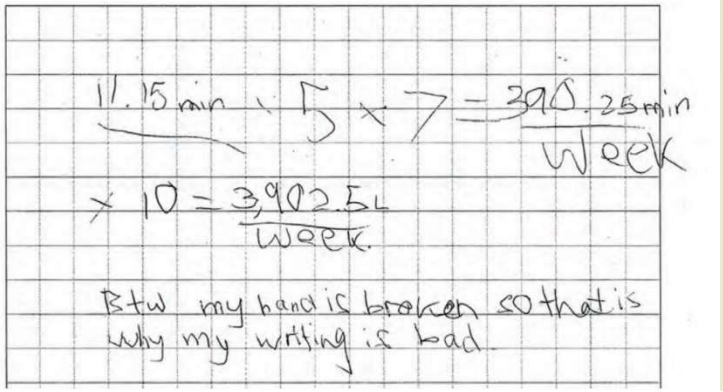
Sample Question 1: Water Usage

Ada



By day	Why frequencies chosen	
4 minutes a day- 32L a day	one shower a day for only 4 minutes	shower / bath
2 flushes a day 12L	avg. person only needs to flush the toilet twice	toilet
5 minutes a day, 30L a day	The bathroom tap can be conserved to 2 minutes leaving 3 for the kitchen	taps (bathroom and kitchen)
1 cycle a day, 16L a day	The dishwasher only needs to be run at the end of the day	dishwasher
1 cycle a day; 60L	The laundry needs to be done at the end of the day ensuring only one cycle	clothes washer
		By reducing shower time and faucet time one can use 150L of water a day, baths are not needed
overall consumption in a week: 1050		
overall consumption in a day: 150		

Blair

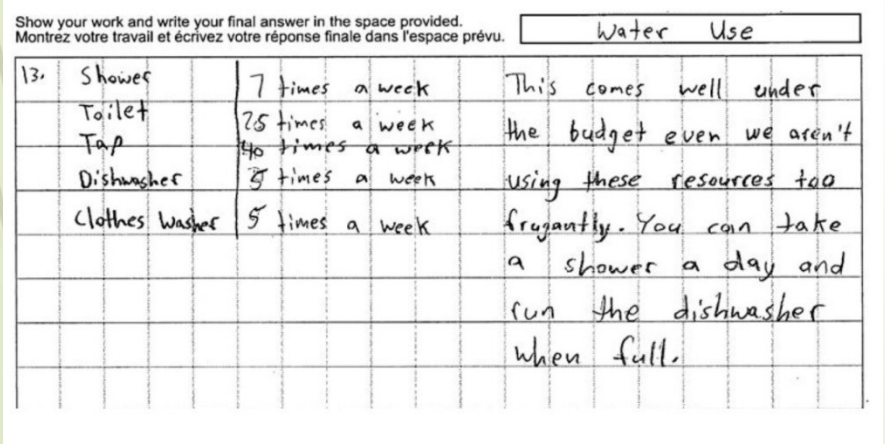


11.15 min . 5 x 7 = 390.25 min / week

x 10 = 3,902.5L / week.

Btw my hand is broken so that is why my writing is bad.

Carl



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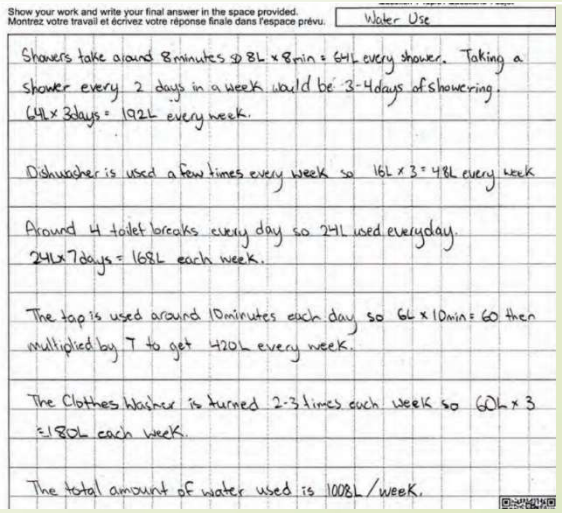
Water Use

13.	Shower	7 times a week	This comes well under the budget even we aren't using these resources too frugantly. You can take a shower a day and run the dishwasher when full.
	Toilet	25 times a week	
	Tap	~~40 times a week~~	
	Dishwasher	5 times a week	
	Clothes Washer	5 times a week	

Dino



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Water Use

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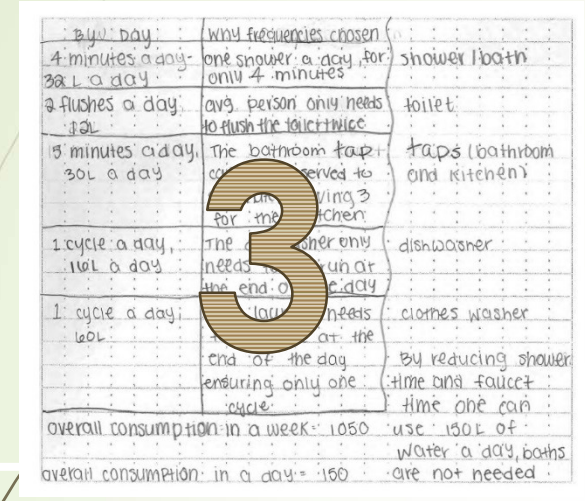
The tap is used around 10minutes each day so 6L x 10min = 60 then multiplied by 7 to get 420L every week.

The Clothes Washer is turned 2-3 times each week so 60L x 3 = 180L each week.

The total amount of water used is 1008L / week.

Sample Question 1: Water Usage

Ada



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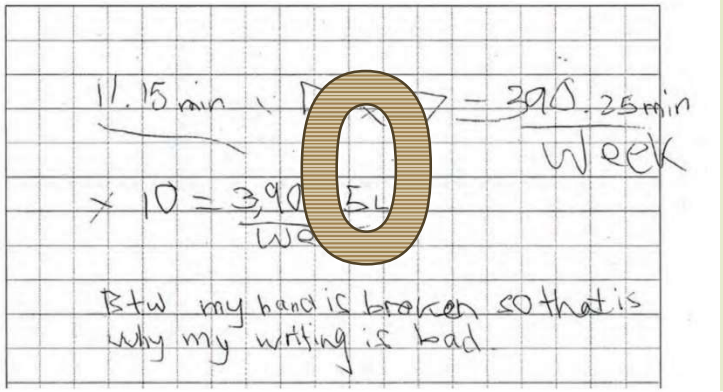
4 minutes a day- 38L a day	one shower a day for only 4 minutes	shower / bath
2 flushes a day 12L	avg. person only needs to flush the toilet twice	toilet
5 minutes a day, 30L a day	The bathroom tap [illegible] served to [illegible] ving 3 for the [illegible] tchen	taps (bathroom and kitchen)
1 cycle a day, 16L a day	The [illegible] her only needs [illegible] un a the end o[illegible] day	dishwasher
1 cycle a day; 60L	[illegible] la[illegible] needs [illegible] at the end of the day ensuring only one cycle	clothes washer
overall consumption in a week: 1050		By reducing shower time and faucet time one can use 150L of water a day, baths are not needed
overall consumption in a day: 150		

3

Blair



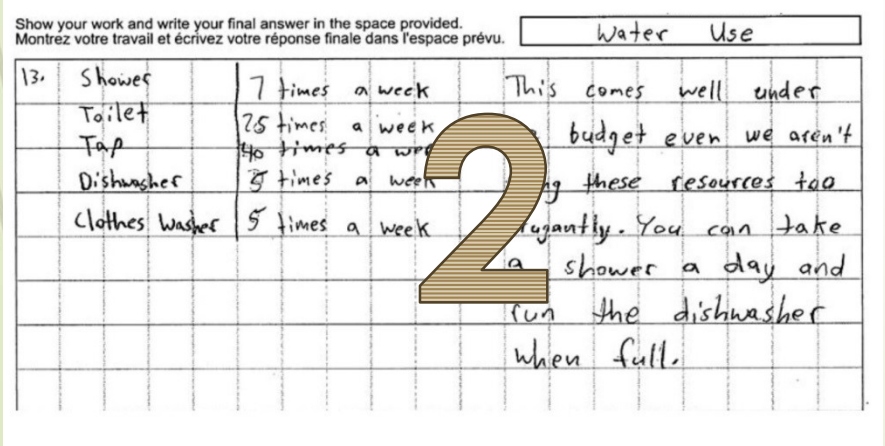
11.15 min [illegible] = 390.25 min / week

× 10 = 3,90[illegible] / we[illegible]

Btw my hand is broken so that is why my writing is bad.

0

Carl



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Water Use

13.		
	Shower	7 times a week
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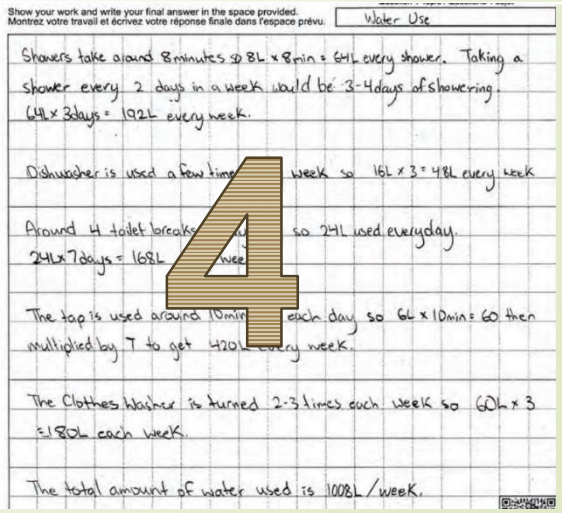
	Dishwasher	5 times a week
	Clothes Washer	5 times a week

This comes well under budget even we aren't [illegible]g these resources too frugantly. You can take a shower a day and run the dishwasher when full.

2

Dino



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Water Use

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The tap is used around 10min each day so 6L x 10min = 60 then multiplied by 7 to get 420L every week.

The Clothes Washer is turned 2-3 times each week so 60L x 3 = 180L each week.

The total amount of water used is 1008L / week.

4

Sample Question 1: Water Usage

Now improve your solution if you need. Then mark your solution based on the 4-point rubric.

Any questions so far?

Sample Question 2: Video Game Company

CONTRACT

This contract governs the partnership between Jae Eun Park and Ted Brown (hereby known as The Founders), doing business as "Jae Eun & Ted's Excellent Video Game Adventures" (hereby known as The Company).

The Company shall create video games.

Founder Jae Eun Park commits to contribute computer equipment (valued at $8500) and $50 000 towards the start-up costs.

Founder Ted Brown commits to contribute $22 000 towards the start-up costs. He will also pay $1250 per month for The Company's expenses.

By signing below, each Founder indicates acceptance of the terms of this contract in its entirety.

Jae Eun Park

Ted Brown

Sample Question 2: Video Game Company

26. Five years after the start of The Company, The Founders decide to sell it for $750 000. To determine their fair share of the sale price, they agree that any contributions made towards start-up costs will be worth 1.5 times their original value. Contributions made after start-up will not be adjusted.

    How much should Jae Eun and Ted each receive from the sale of their company?

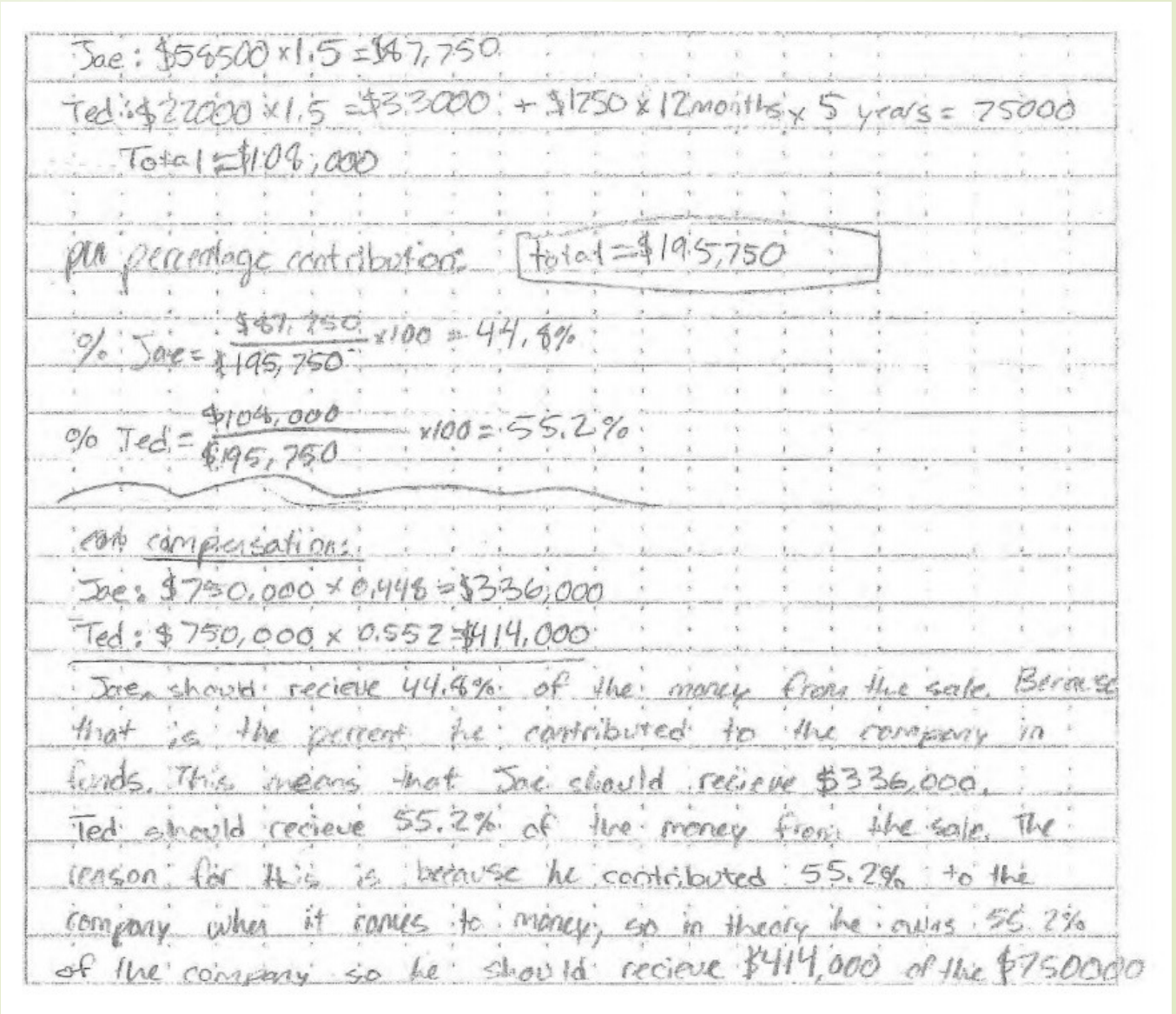
    Explain and justify your solution.

    This question is to be answered on paper.

Sample Question 2: Video Game Company

We will now look at 3 different solutions. The student responses both scored a 4 based on the evaluation rubric.

Sample Question 2: Video Game Company



Joe: $54500 × 1.5 = $67,750

Ted: $22000 × 1.5 = $33,000 + $1750 × 12 months × 5 years = 75000

Total = $109,000

per percentage contribution Total = $195,750

% Joe = $67,750 / $195,750 × 100 = 44.8%

% Ted = $104,000 / $195,750 × 100 = 55.2%

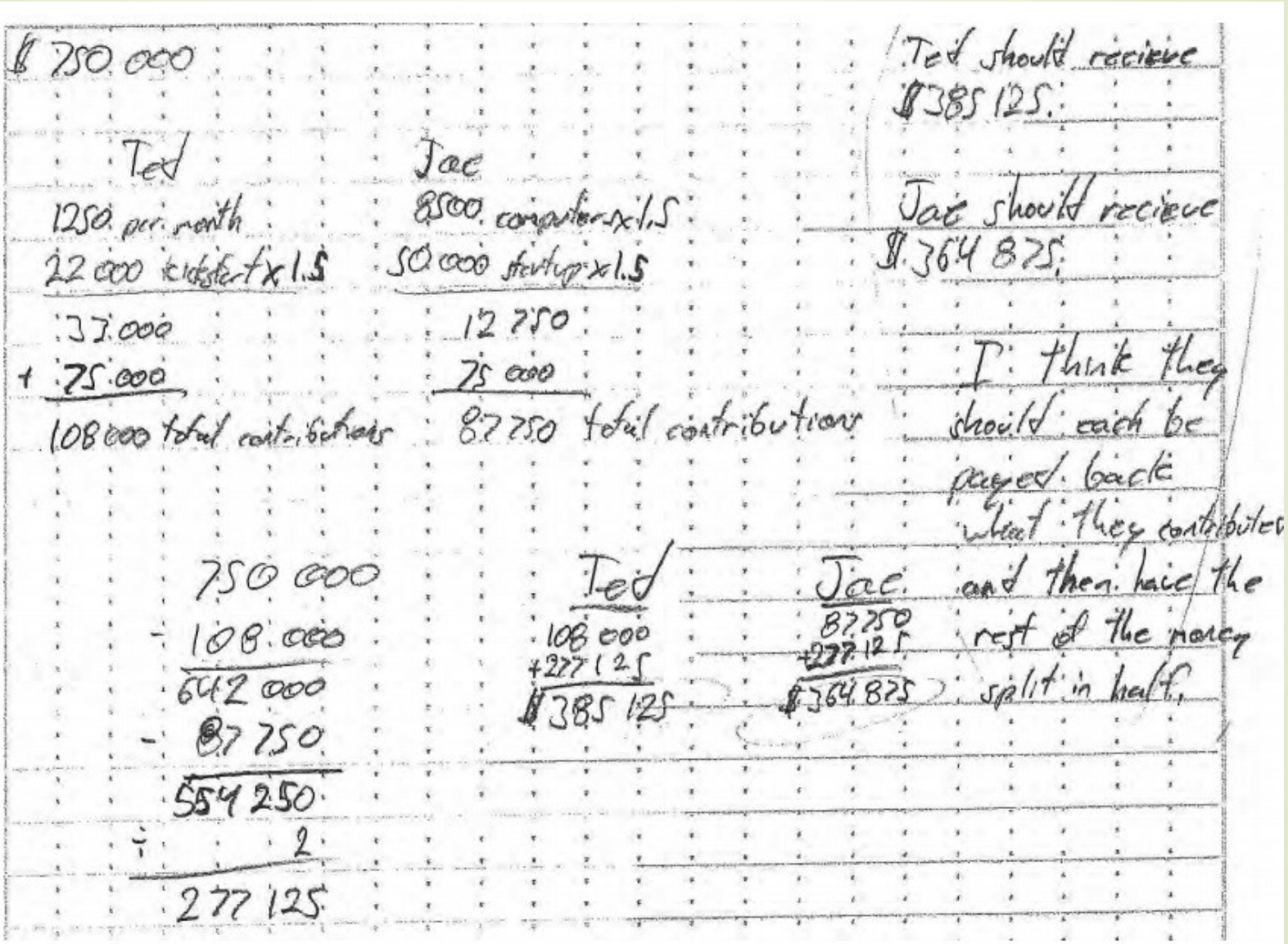
per compensation:

Joe: $750,000 × 0.448 = $336,000

Ted: $750,000 × 0.552 = $414,000

Joe should recieve 44.8% of the money from the sale. Because that is the percent he contributed to the company in funds. This means that Joe should recieve $336,000. Ted should recieve 55.2% of the money from the sale. The reason for this is because he contributed 55.2% to the company when it comes to money, so in theory he owns 55.2% of the company so he should recieve $414,000 of the $750000

Sample Question 2: Video Game Company



Sample Question 2: Video Game Company

Solution 3

This solution is based on splitting the profit of the sale and crediting the difference between investment contributions to the partner that paid more.

The same initial calculations as in Solution 1:

Jae Eun: $50 000 + $8 500 = $58 500
$58 500 × 1.5 = $87 750 (Jae Eun's initial contribution weighted at 1.5×)

Ted: $22 000 × 1.5 = $33 000 (Ted's initial contribution weighted at 1.5×)

Ted continued to contribute $1250/month for 5 years.

$1250 × 5 years × 12 months/year = $75 000

In total, Ted invested: $33 000 + $75 000 = $108 000

Ted invested more than Jae Eun: $108 000 – $87 750 = $20 250.
Ted paid $20 250 more than Jae Eun.

Split the sale income: $750 000 ÷ 2 = $375 000

As Ted invested more in the company, he will receive $20 250 more than half the sale price, while Jae Eun will receive $20 250 less than half the sale price:

Jae Eun: $375 000 – $20 250 = $354 750
Ted: $375 000 + $20 250 = $395 250

Sample Question 2: Video Game Company

You have worked on two sample questions. What are some strategies that you can use? What can you do when you are stuck? Discuss at your table.

Any questions?

Resource Links

Official Graduation Numeracy Assessment Web Site:

https://curriculum.gov.bc.ca/provincial-assessment/graduation/numeracy

Information Brochure:

https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/Graduation_Numeracy_Brochure.pdf

Online Sample Exam (Make sure you try the Digital Response section!)

https://www.awinfosys.com/eassessment/eexams_sample.htm

Resource Links

Printable Copy of the Sample Exam:

https://www2.gov.bc.ca/assets/gov/education/administration/kindergarten-to-grade-12/assessment/grad_numeracy_sample_assessment.pdf

Sample Solutions/Exemplars:

https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/Grad_Numeracy_Scoring_Guide_and_Student_Exemplars.pdf