

Financial Literacy Project Based Unit

Unit Overview

This project-based unit focuses on real life uses of financial literacy that students may encounter. Additionally, it provides opportunities to review calculations using decimals, percentage, and fractions as well as using technology to calculate and present information. This unit allows for student choice and differentiation as the order of project completion does not matter and each project has 3 challenge levels. Each mini-project provides a summative mark and an opportunity for formative learning by redoing parts. Additionally, formative assessment of the curricular competencies is conducted throughout the unit. This unit allows for authentic use of mathematics and clear choice.

Big Ideas

- Decimals, fractions, and percents are used to represent and describe parts and wholes of numbers.
- Computational fluency and flexibility with numbers extend to operations with integers and decimals.

Major Curricular Competencies

- Model mathematics in contextualized experiences
- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
- Use mathematical vocabulary and language to contribute to mathematical discussions
- Communicate mathematical thinking in many ways
- Reflect on mathematical thinking
- Connect mathematical concepts to each other and to other areas and personal interests

Content Area

- Financial literacy — financial percentage
- Operations with decimals (addition, subtraction, multiplication, division, and order of operations)
- Relationships between decimals, fractions, ratios, and percents

Assessment (See attached sheet for details)

- Formative: Observations during math blocks, ability to self assess work, ability to redo parts of mini-projects
- Summative: Final mark on each mini-project & Student unit reflection

Cross-Curricular Links (Core Competencies & Other Subjects)

- Goal setting/Time management
- Use of technology to display, communicate, calculate (EDST?)
- Communicate ideas in a variety of ways (Communication)
- Reflect on time management & work ethic (Personal awareness)
- Design/plan/make personal choices for topics and challenges (Creative Thinking)

General Format

General Timeline	4-5 weeks (Goal: 1 project per week)
Blocks per week	4-5 45-60 min blocks
Work Block	Free work blocks with access to technology and resources as needed. Students must submit individual work, but can help each other with understanding technology, calculations etc. These blocks tend to be a buzz of activity with rich mathematic discussion. Some redirection may be needed, but as long as students are on task, some off topic conversations are acceptable.
Mini Lessons	1-2 mini lessons per week voted on by students. Not all students needed to participate in all lessons.
Teacher Responsibilities	See attached sheet (facilitator of learning)

Differentiation

- Challenge by choice (3 levels for each project)
- ESL/LD students potentially complete fewer projects
- Class experts can help support other students by becoming ‘teachers’ of techniques
- Teacher as facilitator can more easily work with smaller groups/ 1-1 to help provide support and deeper understanding
- Support to redo/correct parts of projects missing in order to demonstrate best learning
- Communicate ideas in a variety of formats (verbally, through technology, written)
- Math board in classroom with key vocab, scaffolding, and extra copies of projects

Possible Mini-Lessons

- Multiplying, dividing, adding, subtracting decimals
- Multiplying sales tax (percent to decimal etc.)
- Using technology to display data in tables/ writing calculation using technology (e.g. Excel)
- Time management & goal setting
- Using calculators efficiently and effectively

Marking the Projects (Teacher Notes)

Big Project Goals

The goals of these mini projects are to:

- Actively engage students in mathematic problem solving
- Practise real skills such as using a calculator, calculating using decimals, fractions, and percentage
- Engage students in mathematic conversation
- Create opportunities for students to build skills in a way that is easy to differentiate while giving students choice and avoiding rote work that is easy to copy/plagiarize
- Work on time management and goal setting skills

With these goals in mind, the ***curricular competencies*** are a powerful tool to track growth through the projects. These projects are designed for deep mathematic thinking and understanding for all students at their level using real life examples.

1. Overall Observations

- a. One sheet of the ***curricular competencies*** grid was printed for each student and labelled in a binder. These competences highlight some of the mathematic reasoning that might be explored during the projects. (See sample)
- b. Goal to record/jot down observations for 3-5 students each day during the math block based on conversation and work. This might be a comment for one box or for several. These comments help you as the teacher determine if any mini lessons are needed and to see the growth of mathematic skills and thinking over time.
- c. Try to add one comment each time a project is marked
- d. The language of the ***curricular competencies*** helped to identify not only the holes in classroom knowledge, but also could easily be used when writing report cards or interim reports. This language is thinking and skills based. By the end of the projects, you should

have several comments on all students and could really see/understand progress in mathematic thinking/reasoning. You might not have a comment for every curricular competency, but you will have interesting data for each student. Record the ideas during math blocks or for five minutes during a break or silent reading, because this is not extra marking but real time valuable data.

2. Grid for Each Project

- a. A small marking grid was used to assess completion/understanding for each project. This made it easy to identify when students needed to complete missing parts.
- b. Grids could potentially be used for self-assessment before handing in to make sure all parts are complete.
- c. Be consistent in the language used for marking. Examples:
 - i. Performance standard: I MM FM EE
 - ii. Check Scale: check minus, check, check plus

Teacher Activities During Math Blocks

During this unit, you as the teacher are a guide helping your students engage in mathematic thinking and reasoning. You are a support, helping kids stay on track, but this is very much student led and you can expect a buzz of activity. All conversations may not be on task, but most will be or can be guided back to the topic. Here are a few ideas:

1. Circulate & Converse

- a. Circulate and engage in mathematic conversations
- b. Encourage peer sharing ideas for source material/ helping each other understand concepts
- c. Connect with students who may be very behind and help them make plans for finishing projects

2. Mini Lessons

- a. Through observation, conversation, and marking you may identify some major holes. Examples:
 - i. Using a calculator to calculate large numbers
 - ii. Adding and subtracting decimals (forgetting to line up!)
 - iii. Determining the cost of a sale item (20% off of 15.99)
 - iv. Using tables to summarize or line up information (data control!)

- b. Once or twice a week you may wish to pull a small group, or invite anyone who wishes to join to review a topic and practise. Large white boards are great for this and don't assign homework.
- c. If several possible lessons surface, you could list them all on the board and have the class vote on what they are most worried about. This is active engagement in learning and identification of problems. It also allows students to self identify as experts on some of the topics and make themselves available to guide other students.

3. Redirect

- a. Redirect off topic conversations if they are very distracting.

4. Make Quick Notes

- a. Make notes on the *curricular competencies* for 3-5 students during each block. I did this after/during conversations or when I was eavesdropping on groups working.

5. Mark

- a. You may get a few minutes to mark a project. The first few don't take long to mark, but you will need to have a calculator to check a few calculations.

Math Mini-Projects

Background Information

After reviewing the basics of fractions, decimals, and percentage, we will now apply our mathematical knowledge to four real life situations. These situations all involve ‘financial literacy’ and research to find out the real cost of many items. Luckily, in our digital world, much of the information we are looking for can be found online. Newspapers, fliers, and a visit to an actual store can also be valuable ways to collect data. We will spend a few days reviewing multiplying and dividing decimals as well as multiplying a percentage of a decimal in order to practice the skills needed for many of the mini-projects.

Mathematic Expectations

- Do at least 5 calculations by hand for each project.
- Learn how to use a calculator properly for all of the calculations.
- Create clear summary tables and complete all parameters for each project. Hand in the summary table and all other requirements.
- Choose the challenge level for each project that fits you best. Some of you can push yourself farther to try the more challenging questions, while others may want to keep it simple and work with the basic challenges.
- You will do your own work, ask for help when needed, and be respectful of others during the math blocks.

How many projects must you complete?

- There are four projects and you must complete the most basic level for all four projects
- If you are feeling overwhelmed talk to me and we will adjust the workload
- You may complete the projects in any order you wish

What is the timeline?

- 2-3 weeks depending on how we are working
- Approximately 40 minutes per day
- I will try to get the iPads once per week for research, but most of the research will have to be completed at home

When do I hand it in?

- As you complete each project, hand it in and I will mark it!
- Complete 1-2 per week in order to not RUSH at the end...

Mini-Project # 1: Decorating a House

Background Information

As you get older, your parents may ask you to help pick out furniture. If you attend college or university, you may have the opportunity to live far away from home and have to fill your house with all of the essentials. Finally, at some point you will live in your own basement, apartment, or house, all of which you will budget for and fill up with furniture and accessories. This all may seem far away, but it can be fun to imagine and plan right now for the future home you might have! In this challenge you will choose your challenge level in order to decorate 1, 2, or 3 rooms using a variety of budgets. You will practice researching deals by using websites or fliers, and calculating sales tax. Sales tax in B.C. is 12% in total.

Skills Used

- Adding & subtracting decimals
- Multiplying/dividing decimals
- Multiplying percentage for sales tax
- Multiplying percentage for sales (optional)
- Research

Major Challenge- choose your challenge level

Choose your challenge level and record everything you will buy. Calculate the sales tax for each item and make sure you provide the total cost of decorating each room. You may use a calculator, but you should do at least 5 calculations by hand and then check your answer with the calculator. This will help you to practice the process, but also not get bogged down when using such large numbers. Use real values for furniture and items that you have found from store websites or fliers. Create a summary table for both the tight and the extravagant budget.

Challenge	# of Rooms	Tight Budget	Extravagant Budget
<i>Level 1</i>	1	1000	4000
<i>Level 2</i>	2	2000	8000
<i>Level 3</i>	3	3000	12000

Parameters

- For each budget and room create a summary chart showing items purchased, store, cost before and after tax, and a total cost for the room
- Show work by hand for at least 5 calculations
- Write a statement explaining what surprised you the most about working on a tight vs. and extravagant budget
- Provide one tip for someone trying to stay on budget while decorating a room

Mini- Project # 2: Going out to Dinner

Background Information

Going out for food can be a fun experience. You spend an afternoon or evening chatting with friends while sharing food and beverages. Many times as you move into your teens and into adulthood, you may wish to split a bill. Servers do not always remember to split the bill for you, so you may have to do a little math yourself. Additionally, you will have to judge service at nicer restaurants to determine the tip. Sadly, in many service industry jobs, staff are underpaid with the expectation that tipping will make up the difference. This is not true in all countries, so if you are travelling outside of Canada make sure you help your parents research tipping customs, however; within Canada tipping is part of the dining experience. In this mini-project, you will practice splitting a bill and tipping at a variety of restaurants. You will need to research menus and tipping practices. If you find coupons for certain restaurants be careful to record these as well as they can save you money! Tip in B.C. ranges from 10-20% depending on service with the average being 15%. We only pay Goods and Service Tax (GST) at restaurants, which is 5%.

Skills Used

- Adding/Subtracting decimals
- Multiplying decimals
- Dividing decimals
- Research

Major Challenge- Choose your challenge level

Choose your challenge level and keep careful mathematic notes. You will need to research the cost of different items and plan meals. You will also need to calculate tip & split the bill between your friends or family.

<i>Challenge 1</i>	Choose one fast food restaurant and one nicer restaurant to go out to with 1 other friend. Carefully meal plan and calculate the cost of each person's meal including tip if necessary.
<i>Challenge 2</i>	Choose one fast food restaurant and two nicer restaurants to go out to with 2 other friends. Carefully meal plan and calculate the cost of each person's meal including tip if necessary.
<i>Challenge 3</i>	Choose one fast food restaurant and two nicer restaurants to go out to with 2 other friends. Calculate the tax on the food as well as the tip when appropriate. Try to find at least one coupon that you can use to save you and your friends money.

Parameters

- Create a summary chart for each meal to show the organized information
- Show work by hand for at least 5 calculations
- Write a statement explaining the hardest and the easiest part of this assignment
- Provide one tip for someone trying to go out for dinner with friends on a budget

Mini-Project # 3: Shopping on Sale

Background Information

You may already be given an allowance, or given a budget at the start of the year to buy new clothing. When looking for birthday gifts for friends, your parents may give you an amount and you work hard to stay within that amount. Already at your age, you have dealt with money and know that you can make it **S---T---R---E---T---C---H** or *shrink* depending on where you go shopping and if you find a sale. In this challenge, you will be given a budget and asked to go shopping. The sales tax in BC is 12% for most goods. If you buy clothing however; you are exempt from Provincial Sales Tax (PST) and will only pay 5% for the Goods and Services Tax (GST). Again, research real values and try to find items on sale.

Skills Used

- Adding/subtracting decimals
- Multiplying decimals/percent
- Research

Major Challenge- Choose your challenge

Challenge	Parameters	Budget
<i>Level 1</i>	Buy at least four items for three different birthday parties. Think about three of your friends or family members and try to get them a nice present under the budget provided. Do not forget to calculate tax on all items.	\$150
<i>Level 2</i>	Back to school shopping! You have been given a budget to buy clothing and items you will need for school. School supplies, new sports equipment, and anything special you might need for <i>shiver</i> high school! Plan carefully and see if you can find some good sales in order to be ready for school and under budget.	\$500
<i>Level 3</i>	Hobbies can get expensive! Plan out and buy everything you might need for a hobby. Don't forget about your new clothes for school and a gift for your friend who just became a big sister. Sometimes it is hard when the baby gets all of the gifts, so you have decided to even it out a little bit! Don't forget about tax!	\$1500
<i>Level 4</i>	A tight budget can be challenging... this challenge is the same as <i>Level 3</i> with a much smaller budget! Look for sales and calculate percentage off of any items that you can. Good luck! If you can't make it work, create a plan to make more money to make up the difference.	\$600

Parameters

- Create a summary chart for your shopping to show the information in an organized way
- Show work by hand for at least 5 calculations
- Write a statement explaining the hardest and the easiest part of this assignment
- Provide one tip for someone trying to find sales when shopping

Mini-Project # 4: Grocery Shopping

Background Information

Food is expensive! For example, in December of 2015 due to drought conditions in the U.S., cauliflower reached \$8.00 per head! Eating healthy and on budget is sometimes challenging but is always very important. Your parents work very hard and find sales in order to help you eat a healthy balanced meal three times a day. For this challenge, you must complete 3 parts. The first part is a challenge by choice level, the second involves learning about how your family shops and the third will be a comparison of the same type of food across different brands. For part two, you may wish to sit down with your parents to talk about shopping, or actually go to the store to help them find really good deals. The tax on food is complex, so for this challenge, I will give you a change to NOT calculate tax.

Skills Used

- Adding and subtracting decimals
- Multiplying decimals
- Dividing decimals
- Multiplying percentage

Major Challenge- Challenge by choice

Challenge Part 1-Imaginary Budgeting		
Level 1	Create a 4 day meal plan for 3 people. Make a shopping list and do some research to find out the cost of items. Make sure you are looking at the CANADIAN version of websites when finding values. Do your best to create balanced meals full of nutrients.	\$100
Level 2	Create a 5 day meal plan for 3 people and then make a shopping list. Go 'shopping' and see if you can stay under budget. Try to find coupons. Do your best to create balanced meals full of nutrients.	\$200
Level 3	Create a 1-2 week meal plan for 3-4 and make a shopping list. You may go to several different stores to get the best prices. Coupons will also be very helpful. Check out websites for weekly sales. Do your best to create balanced meals full of nutrients.	\$300

Challenge Part 2- Your Family Budget
Learning from an expert is an important skill. Your parents are experts at buying food on a budget! Write 5-10 interview questions to ask your parents about how they shop for food, meal plan, and/or find the best deals. You can use this information to help you with part 1. You may also ask what you can do to help make shopping easier. Could you research some of the favourite family food to see when it is on sale? After you develop the questions, ask your parents when they can sit down with you. Maybe you can even help them plan a shopping list and find really good deals! Food is one of those essentials we cannot live without, but we can eat healthy and save money if we are careful.

Challenge Part 3- Comparing a Food Type

Different brands cost different amounts of money. Different containers look like they are good deals, but sometimes if you look closely the weight or volume of actual food is different. In this challenge you will choose a food type you enjoy (cheese, apples, frozen pizza *etc.*) and compare the prices across different brands in order to try to find the best deal. You may have to divide the price out by number of pieces in a container or by weight (per gram or mL) in order to create a fair and balanced comparison. Try to compare at least four brands. If you really want to challenge yourself, choose two or three items to make the comparison. When I am shopping, I am always thinking about what is the best deal. This means I am doing lots of calculations in my head. Sometimes it is very interesting what you find out... sometimes your favourite brand is not even close to the best deal. The easiest way to do research for this part would probably be to create a chart and visit a store to take quick notes. Headings I would suggest include: brand, cost, number of pieces, and weight (grams/mL). The main calculations can be done at home but it can be fast to record the information in the store.

Parameters

- Create a summary chart for your shopping to show the information in an organized way for **Part 1**
- Show work by hand for at least 5 calculations
- Write a paragraph summarizing the most important information you learned from your conversation with your parents for **Part 2**
- Create a summary chart with brand and cost comparison as well as your decision on which product is the best deal for **Part 3**
- Write 3 tips for eating healthy and staying on a budget that everyone can live by

WOW! You are done! You have reviewed many basic math skills and applied them to real life situations. I hope that this project gives you a little more insight into the financial literacy and work that is done in each and every household every single day.

Mini-Project # 5: Personal Financial Exploration

Background Information

The world of finances is varied and interesting. You have worked hard to finish the four major assignments, and as a result you have the freedom to explore any topic in the financial world you would like. You will explore the topic, do research, identify math concepts you might use and complete your work.

Skills Used

- You will identify major math skills used as part of your parameters
- Research

Major Challenge- Challenge by choice

Pick any topic you like.... Research and design project to explore. Here are a few topics, but the possibilities are endless.

- Stock market in Canada, US, Europe and around the world
- The housing market in Canada, Vancouver, or any municipality you would like
- Pro athlete salaries, team salary caps... design your own All Star team and figure out how much it would cost you as the owner!
- Olympians vs. pro athletes.... Who earns more and what is the true cost of training?
- Research the cost of education for the job you want and the salary possibilities
- Plan an extended trip to a country/countries of your dreams and make a budget... how could you save for it?

Parameters

- Choose a topic and do research
- Define a project, create a proposal and show it to me
- Complete whatever research and calculations that are needed

Student Name _____

Math Mini-Projects on Curricular Competencies: Overall Notes

(SAMPLE: Based on grade 7 curricular competencies)

Curricular Competencies	Mark	Comments
Describe mathematical concepts		
Explore, apply, and connect concepts to each other, to other disciplines, and to the real world		
Use mathematical arguments to support personal choices and anticipate consequences		
Inductively and deductively use logic to explore, make connections, analyze, generalize, and make conclusions.		
Use tools or technology to explore and create patterns and relationships		

Implement multiple strategies to solve problems both abstract and real life situations		
Develop, construct, and apply mathematical understanding through inquiry and problem solving.		
Engage in problem-solving experiments that are connected to place, story, and cultural practices relevant to the local community.		
Use mathematical language and vocabulary to contribute to mathematical discussions		
Develop Mathematical understanding through concrete, pictorial, and symbolic representations.		
Use technology appropriately to communicate and represent thinking.		

Mini-Project # 1: Decorating a House

Math Mark: Calculation accuracy & completion / Summary table/Written reflection

STUDENT NAME: _____

OVERALL GRADE: _____

CHALLENGE LEVEL: _____

Criteria	Mark	Comments
Complete Summary Table <ul style="list-style-type: none">• Values• Stores• Tax		
Written Statement		
5 Calculations		

Mini-Project # 2: Going Out for Dinner

Math Mark: Calculation accuracy & completion / Summary table/Written reflection

STUDENT NAME: _____

OVERALL MATH: _____

CHALLENGE LEVEL: _____

Criteria	Mark	Comments
Complete Summary Table		
Written Statement		
5 Calculations <ul style="list-style-type: none">• One multiply decimals• One dividing decimals		

Mini-Project # 3: Shopping on Sale

Math Mark: Calculation accuracy & completion / Summary table/Written reflection

STUDENT NAME: _____ OVERALL MATH: _____

CHALLENGE LEVEL: _____

Criteria	Mark	Comments
Complete Summary Table		
Written Statement		
5 Calculations <ul style="list-style-type: none">• One multiply decimals• One dividing decimals		
Proper use/calculation of tax		

Mini-Project # 5: Personal Financial Exploration

Name: _____

Curricular Competencies	Mark	Comments
Describe mathematical concepts		
Explore, apply, and connect concepts to each other, to other disciplines, and to the real world		
Inductively and deductively use logic to explore, make connections, analyze, generalize, and make conclusions.		
Develop, construct, and apply mathematical understanding through inquiry and problem solving.		

Overall Mark: _____

Mini-Project # 4: Grocery Shopping

Math Mark: Calculation accuracy & completion all / Correct labels on diagrams/pictures parts 1/2

Art Mark: All written reflections, Diagrams from multiple perspectives part 3

STUDENT NAME: _____

OVERALL

MATH: _____

PART 1: Meal Planning

Criteria	Mark	Comments
Complete Summary Table		
5 Calculations <ul style="list-style-type: none">• Demonstrate a variety of calculations		

PART 2: Interview a Parent

Criteria	Mark	Comments
Questions identified		
Clear Answers		

PART 3: Cost Comparison

Criteria	Mark	Comments
Complete Summary Table		
5 Calculations		
Proper use of units		

TEACHER NOTE

- This final mini project could be combined with a HCE mark if you are exploring healthy eating
- This final project could be combined with an English mark if you provide criteria for information paragraphs (part 2)
- Always look for ways to connect the curriculum in order to make your life easier!
- Allow students to redo parts that are missing or incomplete