Linking Learning to Life: Financial Literacy and Mathematics in the Classroom

Financial Literacy in Action
Outline

• Why the Classroom Economy? (Rationale)

• Aspects of the Classroom Economy (set-up, maintenance, and components)

• Curricular Integration

• Ideas for the Future

• References & Resources
Rationale for the Classroom Economy

• Integrate mathematics relevantly into the class routine

• Create an environment for constant math practice

• Allow for math integration into other curricular areas

• Allow students to build connections between events in the classroom
Financial literacy means having the knowledge and skills to make responsible economic and financial decisions with confidence.

(Ontario Ministry of Education)
Financial literacy will help students to:

• Carefully consider their financial choices. This can apply to everyday decisions, (i.e. buying groceries) or bigger investments, (i.e. paying for tuition or buying a car).

• Understand basic money management.

• Develop their own perspectives on financial matters, such as interest rates, mortgage rules or the Canadian/global economy.

• Participate fully in society as knowledgeable, responsible citizens who can confidently make decisions about where and how to invest their money.

• Stay financially stable and healthy throughout life.

• Understand the impact of economic choices on the world they live in.
Rationale for Financial Literacy Education

• Students often graduate from high school without having much awareness of how to navigate the world of finances (Pang, 2010).

• It is widely accepted that financial education should be included in schools and that these skills should be implemented from a young age (Otter, 2010; Sole, 2014).

• School should not be preparation for life, it should be life itself Dewey (1916).

• We do not want “the subject matter of the schools, isolated from life experience,” as Dewey feared might happen (1916, p. 12 as cited in Beck & Kosnik, 2014, p. 43)
Why the Classroom Economy (Rationale)

• Very few schools actually include financial literacy as part of their educational program (Council for Economic Education [CEE], 2014; Organization for Economic Co-operation and Development [OECD], 2014)

• Building these skills early could mean fewer financial mistakes in the future!
Why Teach Financial Literacy through the Classroom Economy?

- Relevance - Students will encounter financial issues throughout life

- Necessity - Students are graduating from school today without having a basic understanding of finances, money, and debt

- Social Justice - Many issues of social justice are the result of, or can be greatly improved by, financial systems

- Fun - Introducing this economy into your class can create a stimulating classroom framework through which you can teach curricular goals

- Financial Literacy should be taught at any age throughout school
What the Classroom Economy is NOT

- It is NOT a rewards and punishment system.
- It is NOT platform for a personal agenda.
- It is NOT another class.
- It is NOT meant to turn the class into miniature capitalists.
- It is NOT intended to create more work, a significant fear for the already swamped teacher (Otter, 2010).
Aspects of the Classroom Economy

1) Basic Framework
2) Classroom Jobs
3) The Class Bank
4) Job Proposals
5) The Wheel of Fate
6) End of the Year
Basic Framework

Meant to:
- Mimic life to make learning relevant
- Give context to curricular context
- Give a practical framework for cross-curricular integration
- Provide a medium for discussing and debating world issues
- Fit within the current realities of the classroom, providing a classroom structure
Basic Framework - Classroom Money

• Classroom money is a real currency…
  Just not recognized by any external government.

• Exchanged for goods and services

• Medium of exchange
Basic Framework- Class Bank

- Simulates banking in the world
- Place to “store” money safely
- Managed by the students
- Banking usually done in the last 15 minutes of the day during clean-up
Class Bank - Math Connections

- Decimals

- Interest Rates (Bonds, Interest Rates on Bank Accounts)

- Negative Numbers (Debt)

- Formulas (if involved in creation of the bank)
Class Bank Example
## Class Bank Example

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**Note:** The table above is an example of a class bank with students' dates marked. Each row represents a student, and the columns indicate attendance or participation on different dates.
Basic Framework - Class Routine

• First two weeks: Mini-lessons at the beginning of each day and reflective lessons at the to establish the class structure

• Prices are explained (bathroom fees, materials fees, etc.)

• Routines are explained (class cleanup, job orders, etc.)
# Fee Structure

## Price List (Subject to Change)

### Must Have
- Pencil (Lost) $5 Finders’ fee
- Eraser (Lost) $5 Finders’ fee
- Desk Rental $10/week
- Taxes $5 *Per Week*

### Things to Buy
- Bathroom/ Water Trip (Free to use at recess and first 10 min of class)
- Bathroom/ Water Trip $5
- Class Store Various Prices
- Auction Various Prices

### Fines and Penalties
- Neatness Fine (End of Day)
  - Cubby $5
  - Desk $5
- Unauthorized Use $20
- Trading Fine $20
- Speeding $5

### Free Stuff
- Reading Book Rental Free
- Text Book Rental Free
- Teacher Provided Mats Free
- Art Supplies for class Free
Basic Framework - Class Jobs

- Pay is assigned to the various classroom jobs.
- Pay scale is differentiated, with different jobs receiving different pay.
- Students are rotated through jobs.
- Builds in unequal wealth distribution from the beginning of the year.
Basic Framework - Classroom Jobs

- Introduced the first week of school
- Try to have 2-3 students for each job
- Student wages
## Basic Framework - Class Jobs

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<thead>
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<td>Lunch Bagger</td>
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<tr>
<td>Orderer</td>
<td>$10</td>
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<tr>
<td>Office Runner</td>
<td>$15</td>
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<tr>
<td>Librarian</td>
<td>$15</td>
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<tr>
<td>Pencil Sharpener</td>
<td>$10</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Job</th>
<th>Salary</th>
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</thead>
<tbody>
<tr>
<td>Banker</td>
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<tr>
<td>Chair Monitor</td>
<td>$15</td>
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<tr>
<td>Paper Handout</td>
<td>$15</td>
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<tr>
<td>Janitor</td>
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Classroom Jobs- Math Connections

• Basic Facts/ Mental Math

• Adding/ Subtraction (Basic Transactions)

• Multiplication (pay per day)
Basic Framework- Job Proposals

• Students can come up with their own additional jobs or businesses to meet a need in the class

• Must hand in a typed (or neatly written) proposal

• Only quality proposals will be considered

• Fee is charged to have your proposal considered and to acquire a business license
Examples of Types of Businesses

• Desk cleaning
• Insurance company
• Market/ Store
• Auction house
• Private Bank
• Wallet Maker
Examples of Types of Businesses

The Pencil + Eraser Rental

Today in Mr. Knutson’s class and are going to make a business about a pencil and eraser rental. How this business will work is we will try to collect as many pencils as possible and let people rent them. The prices for renting a pencil for a week is $5 if some how you lose the rental pencil you will have to pay $10. The prices for renting an eraser is $5 if you lose the rental eraser you will have to pay $5 to the rental business.
Examples of Types of Businesses

Knutson Cards

Try our new cards now! They are only ten dollars each and if you're wondering they are called KNUTSON CARDS. Knutson cards are the credit cards in the class of room 37. All you have to do is put us $10.00 and you will have a Knutson card in seconds. The business owner is the manager is Campbell and we have one worker Connor.

The Steps Of Our Card

The steps of our business are pretty simple. First you need to buy a card. When the bank is open you can put up to $60.00 on your card. When you need to buy something or give someone money you show them your card. Then they withdraw money out of your account, deposit it into their account and then you get a new price on your card. You also need to sign your name on your card so you know it's yours. To put money back into your card it costs $5.00

What the Card Looks Like

The look of the card is a basic white piece of paper, with a neat border and inside there is the word Knutson cards with a line under it with your name on it. To see what the card looks like please look below.

You also need to pay us $5.00 every month for your credit card taxes.

Knutson card
From the owner of the shop, Ryan
Do not copy
Ryan $60.00

To put new money on your card hand your card back to us.!!!!!!!!!!!!!!!!!!
Examples of Types of Businesses
Examples of Types of Businesses

The Junk Shop

We sell lots of supplies like pencils, erasers, pens, highlighters and pencil sharpeners. Every school supply you will need is at the junk shop. At our store we don’t just sell but we also give out change. If you have a 10 in class money and you need change for a five give us your 10 we will give you two fives back. We run our shop on Mondays, Tuesdays and Fridays. The people who work or run our store are owner, co-owners, manager and worker.

From and
Basic Framework- Wheel of Fate

• Spin the wheel to see what happens (doctor’s bill, win the lottery, car repair)

• Simulates real situations that might come up

• Encourages the importance of having an emergency fund

• Insurance company

Math Connection:
• Probability
Basic Structure- Financing Projects

- Projects are financed in three ways:
  - Government bonds
  - Taxes
  - Private investment

- Saving through bonds

- Winning government contracts

Math Connection:
- Percentages
Basic Framework - Social Justice

• Real life exposure to social issues such as:
  • Poverty
  • Income inequality
  • Debt
  • Wealth
• Offers genuine opportunities to come up with possible solutions to social issues that can be tested in the class
  • Immigration
  • Distribution of wealth
  • Social support systems
• Provides opportunities for comparison between outside world events and the classroom
Year-Long Structure

• Beginning of the year: focus on set-up and structure

• Middle of the year: focus on maintenance

• End of the year: wrap-up and closure
The First Month: The Closed Economy

The First Day:
- Send all their supplies back home on the first day
- Provide only the necessities (Pencils, erasers, notebooks)
- Outline the classroom economy with the class
- Train the students on all the jobs EXCEPT banker
- Explain all jobs and start students on their first job in the first week without pay
The First Month: The Closed Economy

- During the second week of school, have them start their jobs with pay and train bankers

- Continue the routine for the classroom jobs

- Paid in cash the second week, direct deposit in bank the rest of the year

- Usually banking is done at the end of the day

- Withdrawals (usually once a week)
The First Month: The Closed Economy

- Supplies are only provided through me
  - Auction
  - Draw
  - CANNOT purchase directly from me
  - Government support
- No outside supplies can be brought in for at least the first month
- Supply and demand
- Emphasize that supplies can and should be bought and sold
- Vote on opening the market at the end of the month
The Fifth Week: The Open Economy vs The Closed Economy

• Discuss the open market economy

• Vote to open up the economy to bring in their own supplies

• A note should go home to the parents explaining the change in the class
The Majority of the Year

- Maintain the classroom economy

- Students run the economy themselves, from the class bank to the enforcement of routines

- The teacher acts as a monitor, addressing issues through class meetings
End of the Year

• The second last week of school is “Retirement and the End of Life”

• Wills, Scholarships, Bursaries, Donations

• Can choose to spend money, donate, bequeath
Curricular Expectations

Sample expectations met:

• **Grade 4- NN Overall**: read, represent, compare, and order whole numbers to 10 000, decimal numbers to tenths, and simple fractions, and represent money amounts to $100.

• **Grade 5- NN Specific**: read and write money amounts to $1000 (e.g., $455.35 is 455 dollars and 35 cents, or four hundred fifty-five dollars and thirty-five cents).

• **Grade 6- NN Overall**: demonstrate an understanding of relationships involving percent, ratio, and unit rate.
General Mathematical Benefits of the Classroom Economy

• Number Sense and Numeration
  • Daily practice with relevant number facts
  • Adding and Subtracting while making change
  • Interest and tax rate calculations
  • Calculating the rate of return on investments
  • Positive (gaining money) and negative (losing money or owing) integer practice
General Mathematical Benefits of the Classroom Economy

• Patterning and Algebra
  • Calculating patterns of income
  • Formulas in the creation of banking spreadsheets
  • Scaling designs, using variables to calculate business costs.
General Mathematical Benefits of the Classroom Economy

- Data Management and Probability
  - Graphing spending habits
  - Graphing income and saving
  - Calculating the odds of rare events (Wheel of Fate)
  - Deciding how much to save in an emergency fund
  - Deciding how much to save and how much to spend on more likely and less likely events
General Mathematical Benefits of the Classroom Economy

• Measurement

• Geometry and Spatial Sense

• These have mostly been integrated through projects in the classroom. (Companies, Art Auctions)
Additional Curricular Integration

• In addition to Math, the economy can be integrated into multiple subject areas:

  • Science
  
  • Health
  
  • Social Studies
  
  • Language Arts
Math Curricular Integration: Junior and Intermediate Science & Mathematics

Design projects

- Science-based design projects can be integrated into the framework of the classroom in order to make these projects more relevant and enjoyable for the students.

Examples of Science Curricular Objectives and associated projects:
- **Grade 5- 2.4 Science Specific**: use technological problem-solving skills (see page 16) to design, build, and test a frame structure.

Mathematics Expectations

- **Grade 5- PA Overall**: demonstrate, through investigation, an understanding of the use of variables in equations.
Sample Junior Math Curricular Integration: Science & Mathematics (Design Project)

1) Break groups into “Firms”
2) Firms compete for government contract reward of set amount.
3) Amount is given to the winner of the contract.
4) Firms must invest their own money in the project leading to:
   1) Budgeting so that the students do not spend the money needed for day-to-day living.
   2) A recognition of the possibility (Calculate probability) that they will not win the award.
5) Have firms demonstrate their models and judge the winner according to set criteria.
Curricular Integration

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Curricular Integration
Junior Design Project Math Curricular Integration: Science & Mathematics

• **Grade 5- PA Overall:** demonstrate, through investigation, an understanding of the use of variables in equations.
  
  • For example, instead of setting a definite length (11cm) set the length to “x”. A side that is 3 times as high would then be 3x. Students could then scale the project.
  
  • let x equal the length of the popsicle sticks or let x equal the of a toothpick.
  
  • How would that change the total size of the structure (ex. Elevator or bridge)?
  
  • How would that affect the cost of the project? How does the change in cost benefit or harm your finances?
Junior Design Project Math Curricular Integration: Science & Mathematics

- **Grade 5- DA Overall:** represent as a fraction the probability that a specific outcome will occur in a simple probability experiment, using systematic lists and area models.

- The government just discovered the (project) will be built in an earthquake zone, but earthquakes only happen with a frequency of one per 300 years.
  - Should the government change the project? What is the probability that there will be an earthquake this year (how likely will it be?)
  - If so, how will you change the design and how much more will your project cost?
  - How do your personal finances affect the bridge project?
  - Create a probability wheel. Spin it and see if the earthquake occurs.
  - (Real life example of rare natural disaster, planning and cost: The Japanese Tsunami of 2011.)
Junior Math Curricular Integration: Technology & Mathematics Private Banks

- Students can build their own banks in Excel or Google sheets similar to the bank used for the class bank.

Expectations:

- **Grade 5 - NU Overall:** solve problems involving the multiplication and division of multi-digit whole numbers, and involving the addition and subtraction of decimal numbers to hundredths, using a variety of strategies;

- **Grade 6 - NU Overall:** demonstrate an understanding of relationships involving percent, ratio, and unit rate

- Technology integration, using spreadsheets for data calculation and tabulation
Junior Math Curricular Integration: Technology & Mathematics Private Banks

1) Students can begin by either loaning their own money or providing storage for students with the benefit of paying them “interest” (a percentage of the money on loan).

2) Students then can loan out the money to other students to make purchases (property, equipment).

3) The loans are scheduled with a fraction to be payed back over time.
Junior Math Curricular Integration: Technology & Mathematics Private Banks

Probability Experiment: A run on the bank

- Banks do not actually keep their money, but rather loan it out for people to use.
- There is a risk that when you own a bank, everyone will want their money at once. If this happens, banks do not have enough money to pay everyone.
- What are the chances this will happen?
- Why might it happen?
- As a bank owner, how could you prepare for it?
Sample Expectations:

- **Grade 5- NU Overall**: read, represent, compare, and order whole numbers to 100,000, decimal numbers to hundredths, proper and improper fractions, and mixed numbers.

- **Grade 6- DM Overall**: collect and organize discrete or continuous primary data and secondary data and display the data using charts and graphs, including continuous line graphs.
Junior/Intermediate Math Curricular Integration: Technology & Mathematics

1) Students start their businesses within the classroom.
2) Students calculate the total value of their business using the earnings and the value of the property.
3) They then divide that number up into shares or equal ownership portions “fractions” of a business. (Maybe at the end of the week, split earnings among owners)
4) Students then sell those fractions to people around the room.
5) These shares can be traded within the classroom, tracking the prices of these shares over time on a line graph posted at the front of the room.
Junior/Intermediate Math Curricular Integration: Social Studies & Mathematics

• **Grade 5- Social Studies Overall:** assess responses of governments in Canada to some significant issues, and develop plans of action for governments and citizens to address social and environmental issues.

• **Grade 6- NU Overall:** demonstrate an understanding of relationships involving percent, ratio, and unit rate.
Junior Math Curricular Integration: Social Studies & Mathematics

• Tax system designs. Students create a system of social safety nets to help meet the everyday needs of students.

• Percentage of each student's wage is collected as taxes and is used to fund student issues (Ex. Student is too poor to afford a bathroom pass and can apply for a government-subsidized pass)

• Discussions surrounding, what is an appropriate amount to be taxed, and how will the tax money be used?
Junior/ Intermediate Math Curricular Integration: Language & Mathematics Non-Profit

• Think of a societal need and work to meet it within the context of the class.

Sample Expectations:

• **Grade 4- Language ML Overall:** 3. create a variety of media texts for different purposes and audiences, using appropriate forms, conventions, and techniques.

• **Grade 6- NU Overall:** read, represent, compare, and order whole numbers to 1,000,000, decimal numbers to thousandths, proper and improper fractions, and mixed numbers.
Junior Math Curricular Integration Language & Mathematics: Non-Profit

• Think of a societal need and work to meet it within the context of the class.

• Example:
  • Collect in-class money to fund the purchase of materials within the class to provide materials for schools lacking in needed materials.
  • Non-profit applies for government funding (Grant proposals??)
  • Has reward for chosen work.
  • Students can both do basic calculations as well as create teaching supplies.
  • Example: Creating supplies for a lower grade.
Junior Math Curricular Integration: Language & Mathematics: Non-Profit
Junior/Intermediate Math Curricular Integration: Language & Mathematics: Non-Profit
Future Ideas (Not Quite Worked Out): Crowdfunding

- Students could use platforms such as Google Forms to generate pledges from students to fund start-up businesses in the classroom.

- Google Forms populates Google Sheets, which allows students to use formulas to calculate totals, make graphs.
Future Ideas (Not Quite Worked Out): Fundraisers

• Art Auctions (Art, Geometry)

• Fun Run Fundraiser for a Cause (Health, Media Literacy, Mathematics)

• Movie day watching class-made movies (Media literacy, Health, Technology)
Final Thoughts

• What would an integrated classroom economy look like at your grade level, in your classroom?

• What projects could be integrated?

Mathematics Strands

• Number Sense and Numeracy
• Geometry and Spatial Sense
• Patterning and Algebra
Try This

• Use one of the curricular areas to brainstorm a project that could be used within the context of the classroom economy.
Ideas for the Future to Explore

• Stock Market

• Creating private banks (Class bank as central bank)

• Non-profits/ Charities

• More curricular integration
Resources


- http://www.fcac-acfc.gc.ca/Eng/resources/Pages/FLRDSAT-OAEBDRLF.aspx


- http://myclassroomeconomy.org/
Resources

- http://www.edu.gov.on.ca/eng/surveyLiteracy.html
- http://www.yourmoney.cba.ca/parents/inside/
- http://www.getsmarteraboutmoney.ca/en/Pages/default.aspx#Vqjs6PkrLjY
References


http://www.edu.gov.on.ca/eng/surveyLiteracy.html