

Lesson 8

Chapter 1: Investing concepts

Recommended Course: Grade 9 destreamed math

Recommended Course Code: MTH1W

Strands: Financial literacy and algebra

Time: One 75-minute period

Topic: The power of compounding



Curriculum Connections

OVERALL EXPECTATIONS:

- F1. Financial Decisions: Demonstrate the knowledge and skills needed to make informed financial decisions.
- C3. Application of Relations: Represent and compare linear and non-linear relations that model real-life situations, and use these representations to make predictions.

SPECIFIC EXPECTATIONS:

- F1.3 Compare the effects that different interest rates, lengths of borrowing time, ways in which interest is calculated and amounts of down payments have on the overall costs associated with purchasing goods or services, using appropriate tools.
- C3.2 Represent linear relations using concrete materials, tables of values, graphs and equations, and make connections between the various representations to demonstrate an understanding of rates of change and initial values.

21ST CENTURY/GLOBAL COMPETENCIES:

- Digital literacy: Selecting and using appropriate digital tools to collaborate, communicate, create, innovate and solve problems.
- Critical thinking and problem solving: The ability to analyze information, think critically, and develop creative solutions to complex problems.
- Communication: Effectively conveying ideas, information and data through various mediums, including written, oral and visual communication.
- Collaboration and teamwork: Working effectively with diverse groups of people, recognizing the value of different perspectives, and achieving common goals.
- Financial literacy: Understanding basic financial concepts and the ability to make informed financial decisions.

Assessment and evaluation

Assessment/success criteria:

Students will

- use formulas to calculate simple and compound interest using a calculator and spreadsheet to consolidate understanding of compound interest
- compare returns of simple and compound interest over different time horizons
- make conclusions as to why compound interest allows individuals to earn more money
- understand why investing early and often, and diversifying, are effective strategies for managing risk and maximizing return

Assessment tools: (Assessment FOR/AS learning)

- Observation (through observing students as they complete the investigation).
- Conversation (discuss before, during and after the investigation).
- Product (investigation worksheet may be collected and assessed, and exit card may be assessed).

Prior learning

Prior to this lesson, students will have an understanding of

- the difference between saving and investing
- basic asset classes, including cash, equities, bonds, crypto, real estate
- the importance of setting goals and time horizons

Instructional strategies

- Direct instruction.
- Teacher modelling.
- Small group work.
- Investigation (problem-based learning).
- Class discussion.
- Scaffolding.
- Questioning.

Materials and resources

- Smarties candies (or any small, colorful candies) or fake money.
- Small jars or containers for each participant (not necessary if using fake money).
- Handout with PowerPoint slides.
- Scientific calculators.



MINDS ON (15 minutes)

- Discuss the basic concept of interest and its two types: simple interest and compound interest. Explain that compound interest is calculated on both the initial amount and the accumulated interest.
- Distribute ten Smarties to each student. Explain that these Smarties represent their initial deposit.
- Discuss the interest rate. In this case, it's 10% compounded annually.
- Divide the class in two: Half will earn simple interest and half will earn compound interest.
- Model how to calculate total Smarties after the first year using the simple and compound interest formulas. Have students record their Smarties totals on the chart provided.
- Discuss as a group how the interest affected their Smarties total during the first year.
- Assign students to do the calculation for each subsequent year (2 through 10) for their respective interest rate.
 - Students earning simple interest will calculate their balance for each year using the simple interest formula (they can divide the years so each student calculates one year).
 - Students earning compound interest will do the same; each time, they will use their Smarties total from the previous year as the new principal.
- Emphasize the compounding effect by discussing how the interest is calculated on the growing Smarties total.
- Facilitate a discussion on how the Smarties totals have grown over the ten years.
- Discuss the significance of compounding and how it differs from simple interest.
- Distribute additional Smarties to students based on their balance at end of year 10.

ACTION (20 minutes)

1. Explain that students are going to watch a video and they should record the answers to the following questions:
 - a. What's the difference between simple and compound interest?
 - b. How does compound interest help one to earn more money from an investment?
 - c. Is earning compound interest more important for short-term or long-term time horizons, and why?
2. Watch Money Gains video: "The power of compounding"
3. Think, pair, share: Have students form groups of two or three and discuss the answers to the questions (three minutes); then discuss as a class.
4. Discuss how compound interest can protect us from the effects of inflation and help our money grow faster.
5. Show students how to calculate simple and compound interest using spreadsheet software:
 - a. Project Excel or other spreadsheet software and model how to create each formula:

A	B
Simple interest	
Principal	\$ 1,000.00
Annual interest rate	0.07
Year	1
Amount earned	\$ 1,070.00

A	B	C
Compound interest		
6% compounded annually		
Principal	\$ 1,000.00	
Annual interest rate	0.06	
Compounding periods per year	1	
Year	1	
Amount earned	\$ 1,060.00	



CONSOLIDATION AND CONNECTION (30 minutes)

1. Navigate to Slide 6 and explain the investigation scenario: You have \$1,000. You can choose between an account that pays 7% simple interest or an account that pays 6% interest, compounded monthly.
2. Have students form their hypotheses: After how many years will the investment earning compound interest of 7%, compounded monthly, become greater than the investment earning simple interest of 6%?
3. Have students use spreadsheet software to create and complete the chart on Slide 8. The teacher may choose to provide an Excel template that already has the formulas and table created, or they may have the students start from a blank sheet. Instruct students to record their conclusions when completed. (Were their hypotheses correct? Why or why not?)
4. Project Slide 9 and discuss their findings as a class. Highlight how compounding is especially effective for longer time horizons.
5. Go through Slides 10–12, reinforcing the importance of investing early and often and diversifying.
6. On Slide 13, explain the scenario demonstrated by the graph, and have students interpret the graph by asking them questions about how much simple vs. compound interest was earned at different time horizons and how this affected the total value of the investment at each time horizon (e.g., 10, 20, 30, and 40 years, respectively).

Homework

- Have students choose a personal savings goal and calculate how long it will take them to achieve this goal if they invest in an ETF tracking the S&P 500 and earn a rate of return of 10% per year, and reinvest their gains each month.

Accommodations

- To support students struggling with literacy: Ensure all materials provided to students are accessible to Read and Write. Materials in this document are accessible to Read and Write.
- To support students with memory: Consider using voice recordings at key points in electronically shared Documents.
- Students can be supported throughout these discussions through teacher prompts.
- Differentiated instruction:
 - Content will be provided auditorily and visually.
 - Differentiation through letting students choose which products to investigate during the “minds on,” and which scenarios to analyze, and how to present their findings.
- Provide organizers/notes:
 - Students will be provided with a handout of the PowerPoint slides.
 - For the investigation, the teacher may provide students with an Excel template that provides the formulas and chart.
- Chunking/scaffolding: The teacher will model how to use the simple and compound interest formulas
- Extra time/adjust pace:
 - Students can complete the task for homework if needed.
 - The teacher can be available for extra help.



References

Grade 9 Mathematics. (n.d.). Mathematics. Retrieved December 2, 2023, from <https://www.dcp.edu.gov.on.ca/en/curriculum/secondary-mathematics/courses/mth1w>

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