

## The Cost of Debt

**\* This is an abridged version of the TLE. Lessons and other materials have been removed.**

<b>Driving Question</b>	Why is it so expensive to borrow money?
<b>Unit Summary</b>	Whether it is by choice or by necessity, assuming some level of debt is a scenario most people confront. Developing an understanding of the hidden costs associated with debt is a fundamental aspect of financial literacy and essential to making informed and responsible financial decisions. Grasping the interplay, for instance, between interest rates, loan terms, and down payments is both empowering as well as crucial to effective debt management and, in some instances, heading off a financial crisis. In this unit, students explore concepts in linear and exponential functions by designing an interactive game in which players are forced to navigate a series of financial scenarios with the goal of minimizing the overall cost of a loan. Games are intended to serve as a financial literacy tool that illustrate the trade-offs and considerations young people often need to account for when borrowing money. In designing the “backend” program as well as playing one another’s games, students will develop a deeper understanding of concepts in exponential modeling.





<b>Culminating Project</b>			
<b>Creative Artifact</b>	Students will use the program Twine to design an interactive, choose-your-own adventure online game in which players are asked to navigate a series of financial scenarios with the goal of minimizing the overall cost of a loan.	<b>Metacognitive Reflection</b>	Throughout the unit, students will have opportunities to reflect on their process, strengths, and areas for improvement. Reflection prompts occur at the end of each checkpoint and more formally after the exhibition. Throughout the TLE, reflection prompts will center around the following metacognitive attainment: <i>“I can reflect on my own learning and how I learn best.”</i>  More information on how metacognition is incorporated into this TLE can be found here.

<p><b>Written Commentary</b></p>	<p>Students will design the “backend” program for their game. This includes both the calculations applied as a player moves through each Level as well as the text explaining some of the trade-offs the players should consider as they are confronted with a new financial decision.</p>	<p><b>External Partnership(s)</b></p>	<p>Students should interact with external partners at least <b>two</b> times in this unit:</p> <ol style="list-style-type: none"> <li>1. Students engage in a Q&amp;A discussion with a financial planner and/or programmer/game designer at some point during Phases 2 and 3.</li> <li>2. During the exhibition when students share their games and engage in discussion about programming and/or financial management.</li> </ol> <p>More information on the External Partnership can be found <a href="#">here</a>.</p>
<p><b>Exhibition</b></p>	<p>The games students design are intended to serve as a financial literacy tool and as a result, students will have an opportunity to share their games with a group of younger peers as well as receive feedback from financial planning and/or programming experts.</p> <p>More detail about planning the exhibition can be found <a href="#">here</a>.</p>	<p><b>Aligned Exemplar(s)</b></p>	<p>This <a href="#">written commentary</a> is an exemplar of the “backend” preparation that students will complete as part of their design process. As students complete each checkpoint, they will translate this information into Twine.</p> <p>The html file, “Twine Program” linked in this folder is an exemplar of the written commentary once it has been translated into Twine. You will need to download this file to your computer and then upload it into the Twine platform (<a href="http://www.twinery.org">www.twinery.org</a>) in order to view the program.</p>
<p><b>Unit Level Student-Facing Materials</b></p>			
<ul style="list-style-type: none"> <li>● Project Guidelines</li> <li>● <a href="#">Student Syllabus</a></li> <li>● <a href="#">Assessment Rubrics</a></li> <li>● Key Vocabulary Terms</li> <li>● Twine User Guide</li> </ul>			

## Standards & Transferable Skill Alignment

Suggested Transferable Skill(s)	Disciplinary Knowledge and Skills
<p><b>Metacognition Competency Attainment:</b> I can reflect on my own learning and how I learn best.</p> <p><b>Targeted Levels:</b></p> <p><b>Level 1:</b> Can identify more than one personal strength, area of growth, and area of interest/motivation.</p> <p><b>Level 2:</b> All Level 1 criteria AND...</p> <ul style="list-style-type: none"> <li>● Can analyze how the demands of a new learning experience are similar and/or different from previous experiences. AND</li> <li>● Can identify ways in which the demands of a learning experience align or don't to personal strengths, areas of growth, or areas of interest/motivation.</li> </ul>	<ul style="list-style-type: none"> <li>● <b>HSA-SSE.A.1</b> - Interpret expressions that represent a quantity in terms of its context.</li> <li>● <b>HSF-IF.A.2</b> - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</li> <li>● <b>HSF-IF.C.7</b> - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</li> <li>● <b>HSF-IF.C.8</b> - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</li> <li>● <b>HSF-BF.1</b> - Write a function that models a relationship between two quantities.</li> <li>● <b>HSF-LE.A.1</b> - Distinguish between situations that can be modeled with linear functions and with exponential functions.</li> <li>● <b>HSF-LE.A.2</b> - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs.</li> <li>● <b>HSF-LE.B.5</b> - Interpret the parameters in a linear or exponential function in terms of a context.</li> </ul>

### Phase-Level Snapshot

Phase 1	Phase 2	Phase 3	Phase 4
<p><i>How can I make sense of my loan options?</i></p>  <p>Students explore the basics of loans: what they are, why people take them out, and how they work.</p> <p><i>Days 1-6</i></p>	<p><i>What is the impact of deferring a loan payment?</i></p>  <p>Students explore compound interest and use this to make decisions regarding loan deferment and loan terms through modeling with exponential functions.</p> <p><i>Days 7-14</i></p>	<p><i>When is it worth it to make a down payment?</i></p>  <p>Students use a loan calculator to explore different loan terms, including down payment options and interest rates.</p> <p><i>Days 15-20</i></p>	<p><i>How can I use my knowledge to teach others about credit and how to minimize the cost of borrowing?</i></p>  <p>Students synthesize and apply what they have learned by building out their game for a second type of loan.</p> <p><i>Days 21-25</i></p>

#### Note to Teachers

Many of the topics explored in this TLE can require some sensitivity given students' invariably different economic backgrounds. It is important to remind students throughout the TLE or when appropriate that we are critiquing systems and structures, not individuals. Moreover, the communities in which your students live impacts their financial experiences. To strive for cultural responsiveness, get to know the financial characteristics of the communities surrounding your school and where students live.

## Phase Level Overview

### Phase 1: How can I make sense of my loan options?

Topic	Driving Question	Lesson Plans
The Psychology of Borrowing	Why are we drawn to borrowing money?	Students analyze two ads for products or financial services and consider how companies encourage us to spend, or borrow, instead of saving or paying down debt.  Lesson 1
Individual Stories	Who or what is responsible for the negative impacts of borrowing?	Students hear about the experience of borrowing from people who have borrowed money in the past.  <a href="#">Lesson 2</a>
Loan Basics	What are some terms to know in order to understand what we are getting ourselves into when we take out a loan?	Students make sense of the specific terms associated with different types of loans.  Lesson 3
Estimating Total Cost of a Loan	How can I quickly compare two loans to see which will cost more?	Students are introduced to the idea of total interest as the “total cost” of the loan. Students model the maximum total cost of a loan given the monthly payment and number of months of the loan, using simple interest.  Lesson 4
Checkpoint 1, Day 1: Loan Options	What is the goal of my final project?	Students will create the first portion of their game, consisting of Levels 1-4. This is the portion that shows the comparison between loans with different terms with a fixed interest rate, under simple interest.  Lesson 5
Checkpoint 1, Day 2: Introduction to Twine	How can I use software to create an online “choose your own adventure” game?	Students are introduced to the game-creation software, Twine, that they will use to create their game. Students learn to create buttons, “passages,” and “links” that will take players through a set of scenarios and decisions.

		Lesson 6
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Phase 2: What is the impact of deferring a loan payment?		
Topic	Driving Question	Lesson Plans
Deferred Payments and Down payments	What are the reasons for and against deferring payments or making a down payment?	Students will explore the psychological and practical considerations at play when determining whether to defer loan payments or whether to place a down payment.  Lesson 7
Linear vs. Exponential Growth	What does it mean for something to grow <i>exponentially</i> ?	Students will explore the difference between linear and exponential growth to get a sense of what it means for something to grow <i>exponentially</i> .  Lesson 8
Calculating Interest Earned	How can I determine how much interest I have earned after a certain period of time?	Given an initial deposit amount and annual interest rate, students will use repeated calculations to determine the amount in interest earned over given periods of time.  <a href="#">Lesson 9</a>
Calculating Interest Owed	How can I use compound interest calculations to determine the cost of a loan?	Students will begin to generalize from their repeated calculations to determine the amount owed after various periods of accruing interest without making a payment.  <a href="#">Lesson 10</a>
Writing Exponential Functions (Day 1)	How can I write a function to express exponential growth?	Students will generalize from their repeated calculations to write a function to describe the amount owed after a given number of months without making a payment.  Lesson 11
Writing Exponential Functions (Day 2)	Given the terms of a loan, how can I write a function to determine the amount owed at any point in time?	Students will write functions to represent the amount owed with a given principal amount and interest rate.  Lesson 12

Checkpoint 2, Day 1: Comparing Deferment Options	How can I present the impact of loan deferment on the overall cost of a loan?	Students will create written commentary for two options for loan deferment and the outcomes associated with each option.  Lesson 13
Checkpoint 2, Day 2: Comparing Deferment Options	How can I translate a set of choices around loan deferment into an online game format?	Students will work in Twine to complete the levels related to the deferment options and the outcomes associated with them.  Lesson 14

### Phase 3: If I don't have to, why would I ever want to make a down payment?

Topic	Driving Question	Lesson Plans
How Banks Determine Interest Rates	How do banks determine the interest rate to charge?	Students will learn about the concept of credit scores, and see the impact of down payments on interest rates, analyzing both consumer and the lender perspectives.  Lesson 15
The Impact of Monthly Payments	What happens to your loan when you make a monthly payment?	Students will explore the impact of making a monthly payment on the total amount owed, including an exploration of making a “minimum payment” on a credit card balance.  Lesson 16
Using Loan Calculators to Compare Options	What tools can I use to analyze loan options?	Students will understand why and how loan calculators accurately model monthly payments and use these to compare various loan options.  Lesson 17
Graphing Loan Options	How can I make a strategic decision about how much of my loan to pay per month?	Students will prepare a graph of monthly payment options and use this to make a decision about how much to pay per month.  Lesson 18
Checkpoint 3, Day 1: Comparing Down	What realistic options can I present regarding down	Students will create the options and written commentary for the next phase of their game, in which they will present options regarding down payment and interest rates.

Payment and Interest	payments, and what will be the outcome of each?	Lesson 19
Checkpoint 3, Day 2: Comparing Down Payment and Interest	How can I present the down payment options and outcomes in a way that will help players make strategic choices in the future?	Students will work in Twine to translate their options and written commentary into the format of their game.  Lesson 20

**Phase 4: How can I use my knowledge to teach others about credit and how to minimize the cost of borrowing?**

Topic	Driving Question	Lesson Plans
Project Review	How can I apply everything I have learned about simple interest, compound interest, deferment, down payments, and interest rates to another scenario?	Students will look back on the questions they have posed in their game and create options and written commentary for the same series of questions for a different type of loan, with different terms and different options.  Lesson 21
Structured Work Time	How can I present the information regarding various loan options in a way that will help players make strong choices in the future?	Students will build all levels related to their second loan option in Twinery.  Lesson 22
Peer Review	What can I learn from my peers' games?	Students will play one another's games and provide peer feedback. This will be followed by structured time to implement the feedback and make any game improvements prior to the exhibition.  Lesson 23
Exhibition	How can I use my game and knowledge about borrowing money to teach others about	Students will share their games with younger peers and engage players of their game as well as financial experts on what they have learned from the games and the process of designing them.



	how to minimize the cost of borrowing?	Lesson 24
Reflection	What have I learned about loans, debt, and about myself?	Students will reflect on what they have learned about loans/debt, how to make financial decisions in their own long-term interest, and their own engagement and learning throughout the TLE.  Lesson 25

### Suggested Pacing Guidance

<b>Week 1</b>	<ul style="list-style-type: none"> <li>● Lesson 1</li> <li>● Lesson 2</li> <li>● Lesson 3</li> <li>● Lesson 4</li> </ul>	<b>Week 5</b>	<ul style="list-style-type: none"> <li>● Lesson 15</li> <li>● Lesson 16</li> <li>● Lesson 17</li> <li>● Lesson 18</li> </ul>
<b>Week 2</b>	<ul style="list-style-type: none"> <li>● Lesson 5 - Checkpoint 1, Day 1</li> <li>● Lesson 6 - Checkpoint 1, Day 2</li> <li>● Flex Day</li> <li>● Lesson 7</li> </ul>	<b>Week 6</b>	<ul style="list-style-type: none"> <li>● Lesson 19 - Checkpoint 3, Day 1</li> <li>● Lesson 20 - Checkpoint 3, Day 2</li> <li>● Flex Day</li> <li>● Lesson 21</li> </ul>
<b>Week 3</b>	<ul style="list-style-type: none"> <li>● Lesson 8</li> <li>● Lesson 9</li> <li>● Lesson 10</li> <li>● Lesson 11</li> </ul>	<b>Week 7</b>	<ul style="list-style-type: none"> <li>● Flex Day</li> <li>● Lesson 22</li> <li>● Lesson 23</li> <li>● Lesson 24 - Exhibition</li> </ul>
<b>Week 4</b>	<ul style="list-style-type: none"> <li>● Lesson 12</li> <li>● Lesson 13 - Checkpoint 2, Day 1</li> <li>● Lesson 14 - Checkpoint 2, Day 2</li> <li>● Flex Day</li> </ul>	<b>Week 8</b>	<ul style="list-style-type: none"> <li>● Lesson 25</li> </ul>