

Rubric Implementation Guidance:

Standards Overview: The following is an overview of the standards addressed in each phase of the TLE as well as those that align most concretely to each of the checkpoint tasks.

	Lesson-Level Alignment	Checkpoint Alignment
Phase 1	7.RP.A.3 - Use proportional relationships to solve multistep ratio and percent problems.	7.RP.A.3 - Use proportional relationships to solve multistep ratio and percent problems.
Phase 2	<p>7.RP.A.3 - Use proportional relationships to solve multistep ratio and percent problems.</p> <p>HSF-IF.A.2 - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.</p> <p>HSF-IF.C.8 - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>HSF-BF.1 - Write a function that describes a relationship between two quantities.</p> <p>HSF-LE.A.1 - Distinguish between situations that can be modeled with linear functions and with exponential functions.</p> <p>HSF-LE.A.2 - Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs.</p> <p>HSF-LE.B.5 - Interpret the parameters in a linear or exponential function in terms of a context.</p>	<p>HSF-BF.1 - Write a function that describes a relationship between two quantities.</p> <p>HSF-LE.B.5 - Interpret the parameters in a linear or exponential function in terms of a context.</p>
Phase 3	<p>HSA-SSE.A.1 - Interpret expressions that represent a quantity in terms of its context.</p> <p>HSF-IF.C.7 - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</p> <p>HSF-IF.C.8 - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.</p> <p>HSF-BF.1 - Write a function that describes a relationship between two quantities.</p> <p>HSF-LE.B.5 - Interpret the parameters in a linear or exponential function in terms of a context.</p>	<p>HSF-BF.1 - Write a function that describes a relationship between two quantities.</p> <p>HSF-LE.B.5 - Interpret the parameters in a linear or exponential function in terms of a context.</p>
Phase 4	Students will revisit all of the above standards as they build out their game to reflect the decisions and consequences of these decisions for the second loan option.	All of the above.

<p>Application of Rubric</p>	<p>Written Commentary: The first page of the rubric reflects the work that students do to design and script the passages that they will later incorporate into the Twine software. While there are additional standards that are addressed over the course of the TLE (see above), those listed here serve as clear indicators against which student work on the final project can be assessed.</p> <p>It is recommended that students receive feedback aligned to this rubric at the end of each checkpoint. Upon receiving this feedback, students should be strongly encouraged (perhaps even required) to revise their work based on this feedback before they begin to work on the next checkpoint. Not only will revisions lead to higher rubric scores, they will also ensure that the game students design runs as it should and reflects accurate calculations. Additionally, because the project students are creating logically builds upon itself, it will be much easier to identify and correct errors at the end of each checkpoint instead of waiting until the end.</p> <p>Twine Program: Use of this rubric is optional. While building out the program in Twine is an important part of finalizing the project and preparing for the exhibition, the mathematical content that appears here is, by design, duplicative with the scripted passages in the written commentary. As a result, the rubric criteria aligned to this aspect of the project does not include content standards and instead relies on Common Core standards for mathematical practice.</p>
<p>Metacognition</p>	<p>Throughout the unit, space should be provided for students to reflect on their strengths and areas of growth, as well as areas of interest/motivation within the context of the unit learning experience. An opportunity for more “summative-style” metacognitive reflection is provided at the end of the unit and space for evaluation on the levels aligned to the first metacognitive attainment, “I can reflect on my own learning and how I learn best” is included in the “Twine Program” rubric.</p>
<p>Interpreting the Rubric Levels</p>	<p>In the context of this project, each rubric “Level” should be considered as follows:</p> <ul style="list-style-type: none"> ● Level 1 = Building Toward Course-Level Mastery ● Level 2 = Approaching Course-Level Mastery ● Level 3 = Fully Meeting Course-Level Mastery

Culminating Project Rubric: Written Commentary

Exponential Functions			
Standard	Analyze and Apply Proportional Relationships: Use proportional relationships to solve multistep ratio and percent problems (7.RP.A.3)	Modeling: Build a function that models a relationship between two quantities. (HSF-BF.A) Interpretation: Interpret the parameters in a linear or exponential function in terms of a context. (HSF-LE.B.5)	Modeling: Build a function that models a relationship between two quantities. (HSF-BF.A) Interpretation: Interpret the parameters in a linear or exponential function in terms of a context. (HSF-LE.B.5)
Evidence	Checkpoint 1: Level 4 - Passages 4 and 5	Checkpoint 2: Level 6 - Passages 8, 9, 10 and 11	Checkpoint 3: Level 8 - Passages 16-23
Level 1	<input type="checkbox"/> Interest owed, total cost, and monthly payment calculations display an emerging understanding of simple interest, but contain more than one conceptual error. <input type="checkbox"/> Messages to the player reflect an almost accurate interpretation of the output values.	<input type="checkbox"/> Total cost and additional interest payment calculations display an emerging understanding of writing exponential functions to describe scenarios, but contain two or more conceptual errors. <input type="checkbox"/> Messages to the player reflect an almost accurate interpretation of the output values.	<input type="checkbox"/> Input and output values display an emerging understanding of how to account for a range of loan parameters, but contain two or more conceptual errors. <input type="checkbox"/> Messages to the player reflect an almost accurate interpretation of the output values.
Level 2	<input type="checkbox"/> Interest owed, total cost, and monthly payment calculations display a developing understanding of simple interest; calculations are nearly accurate and contain no conceptual errors. <input type="checkbox"/> Messages to the player reflect an accurate or nearly accurate interpretation of the output values. <input type="checkbox"/> Solution process is logically organized and comprehensive; may include a small omission.	<input type="checkbox"/> Total cost and additional interest payment calculations display a developing understanding of writing exponential functions to describe scenarios; calculations are nearly accurate and contain no conceptual errors. <input type="checkbox"/> Messages to the player reflect an accurate or nearly accurate interpretation of the output values. <input type="checkbox"/> Solution process is logically organized and comprehensive; may include a small omission.	<input type="checkbox"/> Input and output values display a developing understanding of how to account for a range of loan parameters; calculations are nearly accurate and contain no conceptual errors. <input type="checkbox"/> Messages to the player reflect an accurate or nearly accurate interpretation of the output values. <input type="checkbox"/> Solution process is logically organized and comprehensive; may include a small omission.
Level 3	<input type="checkbox"/> Interest owed, total cost, and monthly payment calculations display a strong understanding of simple interest; calculations are fully accurate and contain no conceptual errors. <input type="checkbox"/> Messages to the player reflect an accurate interpretation of the output values. <input type="checkbox"/> Solution process is logically organized and comprehensive throughout.	<input type="checkbox"/> Total cost and additional interest payment calculations display a strong understanding of writing exponential functions to describe scenarios; calculations are fully accurate and contain no conceptual errors. <input type="checkbox"/> Messages to the player reflect an accurate interpretation of the output values. <input type="checkbox"/> Solution process is logically organized and comprehensive throughout.	<input type="checkbox"/> Input and output values display a strong understanding of how to account for a range of loan parameters; calculations are fully accurate and contain no conceptual errors. <input type="checkbox"/> Messages to the player reflect an accurate interpretation of the output values. <input type="checkbox"/> Solution process is logically organized and comprehensive throughout.
Checkpoint 4: Because this checkpoint prompts students to apply the same calculations completed in Checkpoints 1-3 to a second loan option, feedback on this set of passages should align to the criteria above. This allows students the opportunity to reapply the concepts they learned over the course of the unit in a less scaffolded, more cumulative manner.			

Culminating Project Rubric: Twine Program

Game Design and Process				Metacognition
Standard for Mathematical Practice	Make sense of problems and persevere in solving them (SMP1).	Model with mathematics (SMP5).	Attend to precision (SMP6).	Attainment 1: I can reflect on my own learning and how I learn best.
Evidence	Response to programming challenges.	Applicability of scenarios to the real-world.	Clarity of communication and formatting.	End-of-TLE Reflection Activity
Level 1	<input type="checkbox"/> Rarely approaches challenges with curiosity and a sense of ownership. <input type="checkbox"/> Rarely monitors and evaluates progress/approach and changes course as needed.	<input type="checkbox"/> Sometimes applies unit concepts to real-world scenarios in a way that enhances the authenticity of the game.	<input type="checkbox"/> Some of the passages accurately link to one another and follow an underlying logic that connects to the scenarios and decisions presented.	<input type="checkbox"/> Can identify more than one personal strength, area of growth, and area of interest/motivation; AND <input type="checkbox"/> 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.
Level 2	<input type="checkbox"/> Sometimes approaches challenges with curiosity and a sense of ownership. <input type="checkbox"/> Sometimes monitors and evaluates progress/approach and changes course as needed.	<input type="checkbox"/> Almost always applies unit concepts to real-world scenarios in a way that enhances the authenticity of the game.	<input type="checkbox"/> Most of the passages accurately link to one another and follow an underlying logic that connects to the scenarios and decisions presented.	All previous criteria and... <input type="checkbox"/> When given an opportunity, can reflect on a specific learning experience and can explain how it influenced strengths, areas of growth, and/or areas of interest/motivation.
Level 3	<input type="checkbox"/> Consistently approaches challenges with curiosity and a sense of ownership. <input type="checkbox"/> Consistently monitors and evaluates progress/approach and changes course as needed.	<input type="checkbox"/> Consistently and accurately applies unit concepts to real-world scenarios in a way that enhances the authenticity of the game.	<input type="checkbox"/> All or nearly all passages accurately link to one another and follow an underlying logic that connects to the scenarios and decisions presented.	All previous criteria and... <input type="checkbox"/> When given an opportunity to reflect on a specific learning experience and attempted strategy, can identify at least one strategy that could be used in the future to: <ol style="list-style-type: none"> 1. Leverage or amplify an area of strength interest/motivation, and 2. Improve an area of growth or disinterest.