



Roller Coasters + Rube Goldberg = Financial Literacy

Lesson Plan

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Date: 06/29/2020

Overview & Purpose

Provide the lesson title and a short (3-4 line) purpose statement expressing your vision for this lesson.

Roller Coaster + Rube Goldberg = Financial Literacy. The goal is for students to work together to design a roller coaster and to stay within a budget. Students will submit a building plan and a budget to purchase the building pieces. They will build the roller coaster on the wall with the pieces purchased. A marble will be rolled down the roller coaster and the project will be evaluated using a rubric.

Objectives

List your 3-5 objectives. Specify the new skills that the students will gain as a result of the lesson. What will students have learned or experienced by the end of the lesson?

1. Explain that because of scarcity, people must make choices that result in opportunity costs.

2. Explain that people usually use money to obtain the goods and services they want and explain how money makes trade easier than barter.
3. Record and analyze data to decide if a design solution works as intended to change the speed or direction of an object with a force (a push or a pull).
4. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method.

Materials Needed

What items do you need to complete this lesson? Please include items you requested in your project as well as anything else you used to bring this lesson to life.

1. Wall Coaster The Ultimate Set: Includes Super Starter Kit, Extreme Stunt Kit, Crazy Stairs and Super Loop Add-On Packs
2. "Rube Goldberg: Inventions!" by Maynard Frank Wolfe
3. "Just Like Rube Goldberg: The Incredible True Story of the Man Behind the Machines" by Sarah Aronson and Robert Neubecker
4. Pictures and videos of Rube Goldberg machines (see resource list)
5. Roller coaster scoring rubric (see below)
6. Roller coaster budget sheet (see below)

Verification

What 3+ steps did you go through to make sure that your students understood the concepts you taught in your lesson?

1. Use the budget to check student comprehension on staying within a budget and addition within 1000.
2. Use questions at bottom of budget to show comprehension of wants and needs.
3. Use roller coaster rubric to evaluate the project.

Activity

What activity did you take students through to reinforce the concepts you taught during your lesson?

The lesson plan below is for several days of instruction in both science and social studies.

1. Introduce students to Rube Goldberg by reading the book, "Just Like Rube Goldberg: The Incredible True Story of the Man Behind the Machines." Show pictures and videos listed on the resource list below to show students examples of Rube Goldberg like inventions. Show several examples. You can also use "Rube Goldberg: Inventions!" to show students examples of Rube Goldberg machines.
2. Introduce the words push and pull. Have students identify areas in the Rube Goldberg inventions that are pushes and other areas that are pulls. You can use pictures from the internet (see resource list) or use pictures from either of the two Rube Goldberg books.
3. Needs vs. wants - Use the interactive game found at <https://www.myfloridacfo.com/mymoney/games/needs-vs-wants-game.html> to learn about needs and wants. Discuss as you play the game to be sure students understand the difference between wants and needs.
4. Introduce the concept of scarcity. Show students the video <https://www.youtube.com/watch?v=OMw0RubpcCs> and discuss what resources are limited in our classroom. Talk about making choices because of scarcity. Let students know that there is scarcity with the roller coaster parts because there are not enough of all pieces for all groups. (To create scarcity, you will keep out a funnel, zig zag, and loop so that it is not available to all groups.)
5. Introduce students to a budget by using the webpage <https://www.consumer.gov/articles/1002-making-budget> Read the page with the students and then view the video towards the bottom of the page. Discuss how students might use a budget at home.
6. Show students the parts of the roller coaster kits and demonstrate how the parts go together and work. Point out the parts that are needed to make the roller coaster function properly (needs-wall tack, straight track) and the parts that are really not necessary (wants-curves, zig zag, funnel, loop, tubes) but make the roller coaster more fun.
7. Show students the roller coaster budget sheet. Each team has \$1000 to spend on their roller coaster. Remind students that there are parts for the roller coaster that they will need and there are parts that are wants. As a team they will decide which are wants and which are the needs they will use to stay within their budget. Go over the budget sheet with the students and instruct them on how to fill out the budget sheet.

8. Assign teams or allow students to choose teams. Give teams time to decide on the design of their roller coaster and to fill out their budget sheet. Students will turn in their completed budget sheets for approval. (Check that math is calculated correctly and that groups have stayed within the budget.)
9. Once budgets are approved, it is time to build the roller coasters. Give students the parts that are on their approved budget and allow teams time to build roller coasters. After the roller coasters are built, have each team demonstrate their roller coaster so that others can see how they work.
10. The teacher will score the project using the rubric. (see rubric below)

Resource list:

Self Operating Napkin video - <https://www.youtube.com/watch?v=hZdLjyK89Cw>

29 Rube Goldberg cartoon pictures -

<http://anengineersaspect.blogspot.com/2009/10/29-rube-goldberg-machines-on-october.html>

Honda commercial -

https://www.youtube.com/watch?time_continue=118&v=ve4M4UsJQo&feature=emb_logo

The Page Turner -

https://www.youtube.com/watch?time_continue=107&v=GOMIBdM6N7Q&feature=emb_logo

Roller Coaster Budget

Team Name _____ Members _____

Choose the parts to build your roller coaster. Your budget is \$1000. Choose wisely, you cannot go over your budget.

Parts Price Sheet:

Part	Price	Number of pieces you will use.	Total cost of pieces
Wall tack bundle - stick track to wall	\$50		
Straight track - small	\$10		
Straight track - medium	\$20		
Straight track - large	\$30		
Change up - to change direction	\$40		
Tube	\$100		
Funnel	\$300		
Crazy stairs	\$400		
Loop	\$500		
		Total Spent	

1 - Draw a picture of your roller coaster and label where there is a push or a pull.

2 - What parts of your budget were wants? Explain why they are wants. _____

3 - What parts of your budget were needs? Explain why they are needs. _____

Roller Coaster Rubric

Team Name _____ Team Members _____

Category	4	3	2	1
Teamwork	Team consistently stays focused on the task and what needs to be done. Very self-directed.	Team focuses on the task and what needs to be done most of the time..	Team focuses on the task and what needs to be done some of the time.	Team rarely focuses on the task and what needs to be done.
Budget	Budget calculations are accurate.	Budget calculations contain a few minor mistakes.	Budget calculations contain several mistakes.	Budget calculations contain several mistakes and group requires teacher help.
Roller coaster design	Students were able to identify 6 or more areas of force (push and pull) along the roller coaster.	Students were able to identify 3-5 areas of force (push and pull) along the roller coaster.	Students were able to identify 1-2 areas of force (push and pull) along the roller coaster.	Students were not able to identify areas of force (push and pull) along the roller coaster.
Explains needs vs. wants	Students were able to accurately identify 6 or more roller coaster parts as wants and needs.	Students were able to accurately identify 4-5 roller coaster parts as wants and needs.	Students were able to accurately identify 3-1 roller coaster parts as wants and needs.	Students were not able to accurately identify roller coaster parts as wants and needs.

_____ I worked well with my team.

_____ I worked out math problems correctly.

_____ I was able to label push and pulls.

_____ I was able to explain the difference between a need and a want.

