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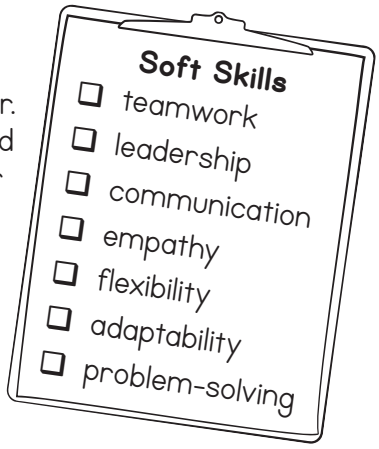
Introducing the Idea



Project-based learning (PBL) is an idea grounded in both education and endeavor. Kids love calling the shots and making something that makes sense to them, and adults know that school should be about more than just preparing students for tests. For these reasons, 21st-century classrooms are increasingly focused on such concepts as student choice, experiential learning, and the fostering of **soft skills**. *Project-Based Learning: Let's Make a Theme Park!* presents a great way to tap into these increasingly valued skills while meaningfully addressing standards and the core curricula.

What Is Project-Based Learning?

Project-based learning is a teaching method that allows students to tackle educational challenges that revolve around large projects. Students work together in groups to solve a problem, address a topic, or design a solution. Together, they think, plan, try, revise, test, and decide. The project usually takes several weeks or even months to complete, and it often involves several multimedia components. From this basic starting point, PBL can go just about anywhere.

Why a Theme Park?

Who isn't awed by (or terrified of) rollercoasters? And who doesn't get excited about special trips to fun places? Most everyone has been to a theme park or other type of amusement park, and they know what they are likely to see there. This prior knowledge gives students a foundation on which to build and grow. And the business of making a theme park lends itself educationally to concepts in science (forces), math (area, money), writing (informational, persuasive), design, and much more.

What Does This Book Do?

Project-Based Learning: Let's Make a Theme Park! is a resource that guides you through every step of a project that will culminate with the transformation of your classroom into a living model of a theme park. Students will form teams, handpick rides and visitor amenities, and create their own sections of the classroom theme park. In the end, teammates will have built a business (based on resources and budgets), designed its look (based on creativity and compromise), and presented their masterworks to their parents and peers. Along the way, they will learn and use skills in the areas of science, math, reading, writing, research, marketing, and more.

Things You and Your Students Will Need

- a classroom (bigger than a closet, smaller than an auditorium)
- a teacher (someone needs to be in charge)
- students (any number between 15 and 40 will do)
- folders (5) in which teams can keep papers
- a copy machine
- art supplies (pencils, markers, scissors, glue, tape, large pieces of cardstock/construction paper)
- STEM supplies (any will do: craft sticks, straws, pipe cleaners, foam pieces, etc.)
- lots of intangible items (curiosity, creativity, adventurousness, teamwork, compromise, etc.)

Stage 1: Getting Started

Set the Stage 1

Theme parks are fun, adventure-filled places to visit. *If we could design our own theme park, how would we begin?*

Stage 1 Summary

Talk about what makes a theme park such a great way to spend a day. The class will then be introduced to the project and hold a vote to decide the overall theme for the park.

Stage 1 Activities

Day 1

Activity: "You at an Amusement Park" (page 10) ➡ Get your class thinking about amusement parks. Ask students to complete the questions and provide details with their answers. Discuss the results as a class.

Day 2

Lightning Lesson: "What Is a Theme?" (page 11) ➡ Talk about how a theme park is a specific type of amusement park. Explain what is meant by "theme" in this context and give examples.

Applied Activity: "Theme's Obvious" (page 11) ➡ As a whole-class, check understanding of the theme concept.

Handout: "Let's Make a Theme Park!" (page 12) ➡ Distribute this page to students. After using this handout to introduce the project, field questions. At this time, you may share details about the process (forming teams to work on parts of the theme park) or end result (a walk-through experience for classroom visitors).

Days 3–5

Whole-Group Activity: "List of Themes" (page 13) ➡ Brainstorm possible themes for the class theme park. There are 13 general themes already listed, and the class can generate 13 more themes for the list.

Lightning Lesson: "How a Democracy Works" (page 14) ➡ Offer a brief lesson in what democracy is, what the word means, and the two main types.

Applied Activity: "Nominating Candidates" (page 14) ➡ Use this page to outline the democratic process for nominating and voting on a theme.

Notes: If needed, define the terms "nominate" (volunteer a solution in the hope it will be chosen) and "second" (offer a supportive vote). The "List of Themes" page can be used to mark nominations and seconds. Explain that the first 6 nominations/seconds will go on the official ballot.

Form: "Official Ballot" (page 15) ➡ Fill out this form with the 6 official candidates. Then copy and distribute this ballot to students and ask them to vote. Make sure they understand that votes are confidential. They should fold their papers in half to cover their votes before they are collected.

Announcement: "The Theme of Our Park" (page 15) ➡ After you have tallied the votes, announce the winner. If there is a tie, use a new copy of the "Official Ballot" form to conduct a run-off election. Once a winner is chosen, have a brief class discussion of what a park with that theme might be like.

The Forces Are With You

LIGHTNING LESSON

The branch of science that deals with matter, motion, energy, and forces is called **physics**. There are many unseen forces that affect how things move, and there are many terms to describe how those things move.

Here are some of the most important to know:

friction—the resistance of motion when two objects rub against each other

gravity—the force that pulls less massive objects (such as yourself) toward more massive objects (such as Earth)

inertia—objects won't move or change how they move unless acted upon by a force

centripetal force—keeps object moving in a circular path and pointed toward the center of the circle

speed/velocity/acceleration—*speed* is how fast an object is moving; *velocity* is the speed of an object plus its direction; *acceleration* is the measurement of change in an object's velocity

The Physics of Paul

Directions: Read the story. Circle the letter beside each best answer.

Meet Paul. Paul is a ball. And if we just let Paul be—if we don't apply any forces to Paul—he just sits there. He doesn't move.

1. In physics, this is an example of **a.** gravity **b.** inertia **c.** laziness

However, if we kick Paul really hard, he will suddenly go from sitting still to moving fast in the direction we have kicked him.

2. In physics, this is an example of **a.** inertia **b.** fraction **c.** acceleration

Paul likes it when we tie a string to him, attach the string to a pole, and swing him around and around the pole.

3. Which force did the string create? **a.** centipedal **b.** centripetal **c.** centennial

Paul also loves rolling down icy roads. But he goes too fast! So we put a bunch of rubber bumps on the road to slow him down.

4. Which force do these bumps create? **a.** friction **b.** inertia **c.** gravity

Team 1 Balance Sheet

The Speed Zone

First, the good news: It is estimated that the Speed Zone will receive $10,000 in earnings every day it is open! And you have 300 units of land on which you can build as many attractions as possible.

Now, the other news: Your daily costs* cannot exceed $10,000, and you cannot build on more than 300 units of land! (*Daily costs are equal to staffing costs plus maintenance costs.)

Time to get to work: Fill your zone without exceeding your budgets. Required attractions/amenities are already listed. Use the subtotal columns to keep track of how much land and money you have used.

Attraction/Amenity	#	Land		Costs	
		Units	Subtotal	Daily $	Subtotal
High-Speed Rollercoaster	1	108	108	$4,200	$4,200
Restroom	1	16	124	$200	$4,400
Souvenir Cart	1	16	140	$500	$4,900
Benches					
Shade Trees					

The Daily Cost for an Attraction/Amenity is calculated by adding together its staffing cost and its maintenance cost.

Total Land *(cannot be more than 300 units)*	_____ units	$_____	**Total Cost** *(cannot be more than $10,000)*

Thrill Rides Research Form

Zone 4: The Spiral Zone

Conduct research on looping rollercoasters. As a team, discuss your research and answer the question below. Draw an image or paste in a printed photo.

Type of Ride: Looping Rollercoasters

Image

Trivia

Question: What was the name and location of the first rollercoaster with a modern loop?

Answer: _____

_____

_____

Engineering

- In what shape are the loops on modern rollercoasters?

_____

- Why are rollercoaster loops never perfect circles?

_____

_____

Science

How does the force of gravity stay the same but the force of the seat and the track constantly change as you travel all the parts of a rollercoaster loop?

_____

_____

Engineering + Science

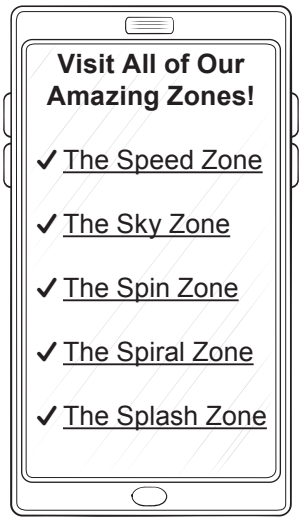
What is centripetal force, and how does it affect riders on a loop?

_____

_____

_____

It's In the App



These days, it seems that there is an app for everything. A theme park would have an app, too. The image to the right shows a screenshot of an imaginary app for the theme park. Each zone has its own link. If someone using the app clicked the link for your Park Zone, what kind of information would they be able to find?

Directions: On the templates below, create screenshots for the part of an app dedicated to your zone. Ask for more copies to make more screenshots. The app pages you show can be any of the following or anything else you think would be fun and informative for guests:

- Zone homepage
- Zone map
- Ride information
- Zone photos
- Zone reviews
- Amenities information

After completing your screenshots, cut them out and glue them to a piece of construction paper so that you may display them at the walk-through presentation.