

FORTNITE

THEME PARK OF THE FUTURE!

Science

9th–10th grade

2–6 hours

Ready to take a thrilling ride? Roller coasters have been entertaining thrill seekers for hundreds of years. It's hard to think of a better way to explore physics.

Fortnite's awesome physics engine provides an amazing opportunity to talk about gravity, momentum, kinetic energy, and force while having some fun at the same time!

In this project, you'll put everything you've learned about those concepts to use by building a theme park with rides to demonstrate them. By the end, you'll be able to describe how your rides show examples of these effects, and take us on a tour of everything else you've built.

Lesson/Author/Class Information

Lesson Title: Theme Park of the Future!

Content/Grade: Science/9th–10th grade

Lesson Timeframe: 2–6 hours

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Description of class / learning environment

This activity can be done as an individual assignment or as a group assignment. The lesson is device agnostic, meaning it does not matter on what Fortnite is played on.

Lesson Overview

Let's talk science! Fortnite's awesome physics engine gives us some amazing opportunities to talk about gravity, momentum, kinetic energy, and force while having some fun at the same time.

In this project, you'll put everything you've learned about those concepts to use by building a theme park with rides to demonstrate them.

By the end, you'll be able to describe how your rides show examples of these effects, and take us on a tour of everything else you've built.

Take your ideas to new heights by turning some of your rides into mini games that your theme park attendees can participate in.

DESIRED RESULTS

What are the learning outcomes for students?

Essential Questions/Big Ideas

Fortnite's physics and gravity systems give us a great opportunity to demonstrate these concepts.

How can we demonstrate and describe the complexities of physics through building a ride in Fortnite?

Can we turn these complex ideas into simple-to-use machines?

How can we take this to the next level by turning our theme park into mini games our players can participate in?

Learning Outcomes/Objectives

By the end of this lesson, students will be able to:

- Understand and describe the principles of gravity, kinetic energy, momentum, and force.
 - Put that understanding to use by creating complex examples.
 - Use design skills to create simple games and machines.
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Standards Mapping

Link to standards that your lesson directly addresses. General links to standards are provided. Teachers should also link to content and state specific standards where appropriate.

[Common Core Standards](#)

[ISTE Standards for Students](#)

[NCSS Standards](#)

[NGSS Standards](#)

Common Core

CCSS.ELA-LITERACY.RST.9-10.5

Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

ISTE

3 Knowledge Constructor

3a Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

3c Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.

DESIRED RESULTS CONTINUED

4 Innovative Designer

- 4a Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
- 4b Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
- 4c Students develop, test and refine prototypes as part of a cyclical design process.

6 Creative Communicator

- 6a Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
- 6b Students create original works or responsibly repurpose or remix digital resources into new creations.
- 6c Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
- 6d Students publish or present content that customizes the message and medium for their intended audiences.

7 Global Collaborator

- 7c Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.

NGSS

HS-ETS1-2 Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

MS-PS2-1

Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

HS-PS3-3

Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy

LESSON PLAN

Learning Activities

Lesson 1: 1 60-minute period

Hook: 15 minutes

Following up lessons that explore prior learning, introduce the concept of creating a theme park, with rides and games to demonstrate these concepts. Show parts of "Playing a Rollercoaster in Fortnite Creative" and "How to Make A Rollercoaster in Fortnite" to get students thinking about what might be possible in Fortnite.

LESSON PLAN CONTINUED

Brainstorming: 15 minutes

Introduce Fortnite as the medium they are to use for creating their theme park. Explore the prefabricated buildings, and discuss the advantages of using the whole space (including vertical space). Engage in a discussion about the physics of Fortnite and what could be built to demonstrate the ideas learned in class.

Planning: 30 minutes

Have students use a tool of their choice to sketch out a plan for their theme park. Review this with students prior to moving them forward to in-game production as a formative assessment to ensure they are thinking through the project appropriately.

Lesson 2

Getting Started: 15 minutes

Have students refer back to their notes and sketch of the theme park.

You should not spend considerable time teaching students how to build in Fortnite Creative mode. Refer students to resources online that may help them in their building experience.

Construction Phase: 1–5 60-minute periods

Provide considerable time for students to build and create their theme park. Circulate around the class offering help and guidance as needed. Ask questions to confirm understanding of prior learning. This period can be extended to provide more building time as needed.

This phase is also the perfect opportunity to build in time for peer review. Have students playtest each other's builds, and provide ideas and feedback for improvement.

Lesson 3

Documentation: 30 minutes

Have students document their creation and the process in some way. Options could include:

- Writing a blog or a note in a notebook.
- Create a video walkthrough of their creation. This could be framed as a "Let's Play" type of video, and would be highly engaging for students who watch YouTuber's or Twitch streamers at home, do this themselves.
- Take screenshots and annotate them using a note-taking application.

LESSON PLAN CONTINUED

Gallery Walk: 30 mins

Have students circulate around the room, spending 3–4 minutes exploring other students' theme parks. Encourage students to ask questions and provide feedback. Teachers should also circulate around the room, spending time with each creation, asking questions, and providing encouragement.

Lesson 4: (Optional) 2–2 60-minute periods

Gamify your Theme Park! Take this project to the next level by having students turn their creations into minigames that continue to demonstrate the scientific principles being discussed, but now add the complexities of multiplayer and points.

Interdisciplinary and 21st-Century Connections

- Students are encouraged to **collaborate** throughout the planning phase of this lesson, and teachers should also encourage students to help and encourage each other throughout the building process.
 - There will be students who excel at building in Fortnite. Those students should be encouraged to be class **leaders** who provide their expertise to students who may struggle with building.
 - Students should be pushed to express themselves **creatively**. Fortnite Creative is a powerful building tool with incredible potential for amazing designs. Students who are creative will do amazing things.
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Modifications and Accommodations

- Students who excel at the building aspects of Fortnite and finish quickly can also be given the opportunity to screen-capture a walkthrough of their theme park in-game, and provide voiceover to their video.
 - Extra time or guidance should be provided to students who have never played Fortnite to allow them to become accustomed to the controls. Refer them to the resources below.
 - Be flexible. Students may need an extra class to complete their projects.
 - Provide game controllers or adaptive controllers based on individual student needs.
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External Resources

- Website: How to Build in Fortnite Creative Mode: https://ca.ign.com/wikis/fortnite/How_to_Build_in_Fortnite_Creative_Mode
 - YouTube: How to Make A Rollercoaster in Fortnite: <https://www.youtube.com/watch?v=HS0J68HX5t4>
 - YouTube: Playing a Rollercoaster in Fortnite Creative: <https://www.youtube.com/watch?v=aZadWNd-Hcl>
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ASSESSMENT

Assessments

Through conversation and interaction, students will demonstrate their understanding.

Throughout the building process, students will document their learning in a portfolio style of their choosing to provide formative evidence of understanding.

They will create their world in Fortnite Creative as a way of showing a summative grasp of the topic.

They will also disseminate what they know to their peers and teachers verbally as part of a demonstration either in person or through video.

Rubric

	Developing	Competent	Proficient	Distinguished
Project Content/ Learning Objectives	Theme Park and ride design does not show an understanding of the goals or learning objectives.	Theme Park and ride design shows a basic understanding of the goals and a basic demonstration of learning objectives.	Theme Park and ride design reflects understanding of the goals and a demonstration of desired learning objectives.	Theme Park and ride design reflects an understanding and synthesis of the goals, and a mastery of the learning objectives.
Project Development	Theme Park and ride design does not work, or is only partially complete, preventing its intended use.	Theme Park and ride design demonstrates basic functionality, and is mostly complete.	Theme Park and ride design functions in the way the student intended and is complete.	Theme Park and ride design is functional and refined, with extra features that exceed expectations.
Project Aesthetics/ Design	Theme Park and ride design requires more attention to the look and feel of the experience as well as the general design.	Theme Park and ride design shows some attention to aesthetics and thoughtful design but is incomplete or lacking in some aspects of layout and design.	Theme Park and ride design is well organized and pleasing to the eye; easy to navigate and understand. Demonstrates thoughtful design.	Theme Park and ride design is well organized, makes good use of space; great use of available and user-created assets; world is inviting and thoughtful, and intentional design is apparent.
Reflection	Student demonstrates difficulty describing the intent of the theme Park and ride design.	Student can mostly describe/ reflect upon the basics of the theme Park and ride design.	Student provides a thoughtful reflection/ explanation of the Theme Park and ride design and how it relates to the desired learning outcomes.	Student can describe the Theme Park and ride design in great detail, demonstrating a depth of understanding that exceeds expectations..