# Roller Coaster History

## Aligned Lesson 1

| Cristina Geisler  
Grades 11-12 | About the author/teacher:  
Science Teacher: Physics  
cgeisler@sd206.org  
Bloom Township District 206  
Chicago Heights, Illinois |
|----------------|----------------------------------|
| **Related Unit:** Weather and Climate Potential  
Overall Effect on Roller Coaster Design | **Lesson Length:** 2-3 class periods of one hour |
| **NGSS Standards: ESS2-1, ESS2-2**  
HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.  
**Framework Reference:** ESS2.D.  
**ES53-1 Earth and Human Activity**  
Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.  
**HS-ESS3-4 Earth and Human Activity**  
Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* | **CCSS ELA:** CCSS.ELA-Literacy.WHST.11-12.2  
Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.  
**CCSS Math:** CCSS.Math.Practice.MP4 Model with mathematics. CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others.  
**Cross-Curricular Standards**  
SS.G.1.9-12: Use maps (created using geospatial and related technologies, if possible), satellite images, and photographs to display and explain the spatial patterns of physical, cultural, political, economic and environmental... |
<table>
<thead>
<tr>
<th>Library of Congress Primary Sources</th>
<th>Materials/Supplies/Resources</th>
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</table>
| [Image](https://www.loc.gov/rr/news/topics/coasters.html) | • Projector  
• Student access to computers and the internet  
• Primary Source Analysis Tool  
Additional teacher’s resources.  
[https://www.youtube.com/watch?v=eRXaKXXSTw](https://www.youtube.com/watch?v=eRXaKXXSTw) |
Enduring Understandings | Essential Questions
---|---
- History of Roller Coasters (SS.G.1.9-12)  
- Structures can be designed to serve particular functions by, taking into account properties of different materials, and how materials can be shaped and used. (HS-ETS1-2) | - How have roller coaster building techniques changed over time?  
- How did the Great Depression and WWII impact the production of roller coasters?

Transfer Goals

- Asking questions  
- Obtaining, evaluating, and communicating information  
- Constructing explanations (for science)  
- Identifying Patterns and Causes/Effects to make future predictions  
- Write informative/explanatory texts.

Learning Objective

- Students will be able to list five facts about the history of rollercoasters. (Social Studies:SS.G.1.9-12, [CCSS.ELA-Literacy.WHST.11-12.2](#))  
- Students will be able to describe two of the economic impacts on roller coasters production. (Social Studies:SS.G.1.9-12, [CCSS.ELA-Literacy.WHST.11-12.2](#))
Students will be able to write informative and technical texts about roller coaster structures. (CCSS.ELA-Literacy.WHST.11-12.2)

**Engage:** How can I get students interested in this? (20 minutes)

- Have you ever been on a roller coaster ride? Which one is your favorite? Why?
- What do you know about the history of the roller coaster?

Show students the picture of the first roller coaster built in U.S.
https://www.loc.gov/item/2004707400/

Ask questions like:

What does this picture represent?
By looking at the picture, can you tell when this roller coaster was built?
What materials were used to build it?
What are some differences and similarities between this roller coaster and some roller coaster that we are seeing today?
What are some weather related conditions that could affect this type of structure?

Teacher’s resources for answers:
http://www.history.com/this-day-in-history/first-roller-coaster-in-america-opens
https://www.loc.gov/rr/news/topics/coasters.html

**Explore:** What tasks/questions can I offer to help students puzzle through this? (45-60 minutes)

Individually, students use internet resources in order to explore roller coaster history and facts.

To help students with their research provide the following links:

https://www.loc.gov/rr/news/topics/coasters.html
http://www.history.com/this-day-in-history/first-roller-coaster-in-america-opens


https://www.ultimaterollercoaster.com/coasters/history/start/america.shtml

https://www.youtube.com/watch?v=e

https://chroniclingamerica.loc.gov/lccn/sn84020274/1904-05-25/ed-1/seq-5/#words=giants+giant+SCENIC+ride+THRILLS+Scenic+thrills+Railway+RAILWAY&date1=1886&sort=relevance&rows=20&searchType=advanced&proxdistance=5&state=&date2=1904&ortext=ride+roller+coaster+giant+thrill+racer&proxtext=scenic+railway&phrasetext=&andtext=&dateFilterType=yearRange&page=2&page=3&page=1&index=11

https://chroniclingamerica.loc.gov/lccn/sn86063381/1914-08-08/ed-1/seq-4/#words=Thrilling+thrill+thrilled+ride+ROLLER+coaster+COASTER+rides+roller&date1=1911&sort=relevance&rows=20&searchType=advanced&proxdistance=5&state=&date2=1919&ortext=ride+roller+giant+scenic+thrill&proxtext=&phrasetext=&andtext=coaster&dateFilterType=yearRange&page=2&page=3&page=8

https://chroniclingamerica.loc.gov/lccn/sn99021999/1915-08-29/ed-1/seq-24/#words=COASTER+ride+coaster+riding+rides+ROLLER&date1=1911&sort=relevance&rows=20&searchType=advanced&proxdistance=5&state=&date2=1919&ortext=ride+roller+proxttext=&phrasetext=&andtext=coaster&dateFilterType=yearRange&page=2&page=3&page=17
Differentiated Instruction.

For students that need more structure with their research, provide the following questions:

Roller Coaster history

1. Describe the earliest roller coaster ancestor, including the time and, how it worked. Example answer (monumental ice slides in Russia).

2. What country imported the ice slide idea from Russia? Did it work with the country's climate? What adjustments were made?
   Example answer (France. Warmer climate usually melted the ice so French built waxed slides instead. They then added wheels to the sleds).

3. What country designed the first roller coaster where the train was attached to the track? What year? (In 1817, the Russes a Belleville -Russian Mountains of Belleville)

4. Where and when did the first roller coaster appear in the United States? What was the original purpose of this track? Example answer (The first roller coaster was called the Mauch Chunk Switchback Railway and was built in the mountains of Pennsylvania in the mid-1800s. The track was originally built to send coal to a railway).

5. Who was the inventor and “father of the roller coaster”? (Marcus Thompson).

6. How long was the track of Thompson's Roller Coaster? How fast were the cars moving in m/s? Please convert! Example answer (450-foot steel and wood track on which the cars moved at six miles per hour)

7. How roller coaster production was affected during the Great Depression and World War II? When was the second roller coaster made in U.S.? Example answer (With the Great Depression and World War II, roller coaster production declined, but a second roller coaster boom in the 1970s).

8. Today the rollercoaster are advertised using newspapers, TV channels, radio and social media. How were the roller coaster rides advertised in the 1800-1900? How much did it cost to ride?

**Explain:** How can I help students make sense of their observations? (15-20 Minutes)

- Have students work in pairs.
- Allow each pair 15 minutes to discuss their findings about roller coaster history.
- Allow students the opportunity to argue and compare their claims with their classmates.
- Have students list their findings on whiteboards.
- Students will present their findings to class and get peer review. Teacher acts as a facilitator and helps conducting students’ discussions.
Extend/Elaborate: How can my students apply their new knowledge to other situations?

- How has Roller Coaster building techniques changed over time?

Students will work in pairs to design a timeline on their findings about roller coaster history. The timeline must include the following:

Roller Coaster History

1. Describe the earliest roller coaster ancestor, including the time and, how it worked. Example answer (monumental ice slides in Russia).

2. When, and what country imported the ice slide idea from Russia? Did it work with the country’s climate? What adjustments were made?
   
   Example answer (France. Warmer climate usually melted the ice so French built waxed slides instead. They then added wheels to the sleds).

3. When and what country designed the first roller coaster where the train was attached to the track? What year? (In 1817, the Russes a Belleville (Russian Mountains of Belleville).

4. Where and when did the first roller coaster appear in the United States? What was the original purpose of this track? Example answer (The first roller coaster was called the Mauch Chunk Switchback Railway and was built in the mountains of Pennsylvania in the mid-1800s. The track was originally built to send coal to a railway).

5. When and who was the inventor and “father of the roller coaster”? (Marcus Thompson).

6. How long was the track of Thompson's Roller Coaster? How fast were the cars moving in m/s? Please convert! Example answer (450-foot steel and wood track on which the cars moved at six miles per hour).

7. How roller coaster production was affected during the Great Depression and World War II? When was the second roller coaster made in U.S.? Example answer (With the Great Depression and World War II, roller coaster production declined, but a second roller coaster boom in the 1970s).

Students will write the timeline in their Roller Coaster Journal.

Differentiated Instruction: Students can create a poster, PPT or a Prezi presentation and present it to the class.
**Evaluate:** How can I help my students self-evaluate and reflect on the learning? (one hour)

- Check for understanding questions will be utilized during large and small group instruction. Students will be asked open-ended questions during small group and individualized instruction to check for understanding.
- Self-evaluate: Students will have multiple opportunities to self-evaluate their progress during the class discussions, peer review and teacher review.
- Formative Assessments: Whiteboard presentations. Students have to present their findings and be ready to defend the results in front of the class. They have to be able to answer questions for their peers. The students’ discussion of the material is an important aspect of the learning. Be sure that all students participate. Listen to individual responses. Evaluate if the student can make sense of the information during whiteboard presentations.
- The rubric for timeline is provided below.

<table>
<thead>
<tr>
<th>Describe the earliest roller coaster ancestor, including the time and, how it worked. Provide a diagram.</th>
<th>Exceeds: Timeline has the Name, date and details on how this rollercoaster works. A diagram is also present.</th>
<th>Meets: Timeline has some details on how this rollercoaster works. No diagram is in display.</th>
<th>Inadequate: Timeline is missing all the information on this topic.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When and what country imported the ice slide idea from Russia? Did it work with the country's climate? What adjustments were made? Make a diagram of your findings.</td>
<td>Timeline has the name of the country that imported the ice slide idea, adjustments are listed, and a diagram is in display.</td>
<td>Timeline has the name of the country that imported the ice slide idea, adjustments are missing, and a diagram is not display.</td>
<td>Timeline is missing all the information on this topic.</td>
</tr>
<tr>
<td>When and what country designed the first roller coaster where the train was attached to the track? What year?</td>
<td>Timeline has the name of the country where the first roller coaster was designed. The date and the year are also listed.</td>
<td>Timeline is missing one or more pieces of information on the topic.</td>
<td>Timeline is missing all the information on this topic.</td>
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<tr>
<td>Question</td>
<td>Availability</td>
<td>Timeline Information</td>
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<tr>
<td>Where and when did the first roller coaster appear in the United States?</td>
<td>All the information</td>
<td>Timeline is missing one or more pieces of information on the topic.</td>
<td>Timeline is missing all the information on this topic.</td>
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<tr>
<td>What was the original purpose of this track?</td>
<td>on the topic is present on the timeline.</td>
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</tr>
<tr>
<td>When and who was the inventor and “father of the roller coaster”?</td>
<td>All the information</td>
<td>Timeline is missing one or more pieces of information on the topic.</td>
<td>Timeline is missing all the information on this topic.</td>
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<td></td>
<td>on the topic is present on the timeline.</td>
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