

PROGRAM

Marble Roller Coasters



ORGANIZATION NAME

Herschell Carrousel Factory Museum

AVAILABLE FORMATS

- Performance
- Single Workshop
- Multi-Session
Residency Workshop
- Field Trip

GRADE LEVELS

- Pre-K
- K – 2nd
- 3rd – 5th
- 6th – 8th
- 9th – 12th

MAX NUMBER OF PARTICIPANTS

In-Person: 35

PROGRAM LENGTH

Single Workshop: 45 minutes
Field Trip: 90 minutes

PROGRAM DESCRIPTION

The Allan Herschell Company was known for its carrouseles but made over 30 other types of amusement rides, including roller coasters. Students will build roller coasters during the workshop.

CURRICULUM STANDARDS

This program supports these NYS or Next Generation Learning Standards:

- 3SL1b: Follow agreed-upon norms for discussions by actively listening, taking turns, and staying on topic.
- 3SL1d: Explain their own ideas and understanding of the discussion
- 4SL1b: Follow agreed-upon norms for discussions and carry out assigned roles.
- 4SL1c: Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
- 4SL2: Paraphrase portions of information presented in diverse formats (e.g., including visual, quantitative, and oral).
- 5SL1b: Follow agreed-upon norms for discussions and carry out assigned roles.
- 5SL1c: Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
- 5SL1d: Consider the ideas expressed and draw conclusions about information and knowledge gained from the discussions.
- 5SL2: Summarize information presented in diverse formats (e.g., including visual, quantitative, and oral).
- 6SL1d: Consider the ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.
- 4.6c Improved technology such, as the steam engine and the telegraph made transportation and communication faster and easier. Later developments in transportation and communication technology had an effect on communities, the State, and the world.
- 4.6d Farming, mining, lumbering, and finance are important economic activities associated with New York State.
- 4.6e Entrepreneurs and inventors associated with New York State have made important contributions to business and technology.
- 4.6f Between 1865 and 1915, rapid industrialization occurred in New York State. Over time, industries and manufacturing continued to grow.
- 8.2a Technological developments changed the modes of production, and access to natural resources facilitated increased industrialization. The demand for labor in urban industrial areas resulted in increased migration from rural areas and a rapid increase in immigration to the United States. New York City became the nation's largest city, and other cities in New York State also experienced growth at this time.

Next Generation Science Standards:

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4. Develop a model to generate data for iterative test

NYS Learning Standards for the Arts:

- VA:Cr1.2.5. Identify and demonstrate diverse strategies for artistic investigation to choose an approach for beginning a work of art.
- VA:Cr3.1.4. Revise artwork in progress on the basis of insights gained through peer discussion.
- VA:Cn11.2.7. Identify and explore roles and responsibilities of artists and designers within a community or culture.
- VA:Cn11.2.8. Identify and explore careers in which innovation and creative problem-solving skills are fundamental to success.
- VA:Cn11.2.HSL. Investigate how skills used in developing artistic solutions can be applied to study in other disciplines and explore how they are sought-after work force attributes in other fields.
- VA: Cn11.1.5. Explore how works of art and design contribute to the quality of life within a culture.
- VA:Cn11.1.6. Analyze how works of art and design correlate with the needs, desires, beliefs, and traditions of a culture.

Contact Arts for Learning WNY for more information.
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EDUCATIONAL OBJECTIVES

1. Students will understand the design process that is required of engineers.
2. Students will understand kinetic and potential energy.

LOGISTICS/EQUIPMENT

- tables and chairs are ideal

VOCABULARY

Blueprint – a design plan or other technical drawing

Kinetic Energy – energy from motion

Potential Energy – stored energy that transforms into kinetic energy

POST-PROGRAM ACTIVITIES & RESOURCES

- Draw a blueprint of your final design.
- Explore forces with Just Move Along: https://www.carrouselmuseum.org/uploads/6/0/3/8/6038428/move_around.png

Resources:

- Mad Mouse sketch
- <https://physicsworld.com/a/twists-turns-thrills-and-spills-the-physics-of-rollercoasters/>
- <https://science.howstuffworks.com/engineering/structural/roller-coaster3.htm>
- https://www.teachengineering.org/lessons/view/duk_rollercoaster_music_less

ORGANIZATION DESCRIPTION



The Herschell Carrousel Factory Museum, operated by the Carrousel Society of the Niagara Frontier, is a premier national historic site and community resource for family recreation and learning that fosters an appreciation for the unique heritage of the carousel and related industries in the Niagara Region.



Arts for Learning WNY's mission is to inspire, expand learning, and strengthen our community through engagement with the arts.

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