

# A Wild Ride! Week 2: Grades K-2

## Day 5: My Wild Ride: Improve

### Teacher/Parent Background

Scientists and engineers are always faced with challenging questions and problems. In order to best explain the world around them or propose valuable solutions, scientists and engineers follow steps to accomplish these goals. In engineering fields, engineers use the Engineering Design Process to propose solutions to problems in order to make the world a better place or to provide some much needed fun!

### Overview

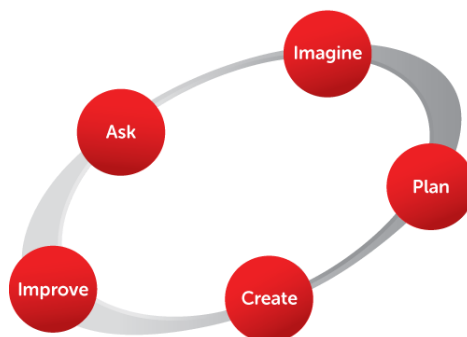
In this activity, young learners will use their experiences designing and testing a roller coaster to propose and implement improvements.

### Related Standards

- **Plan and carry out investigations** which demonstrate how equal forces can balance objects and how unequal forces can push, pull, or twist objects, making them change their speed, direction, or shape.

### Key Terms

- matter - the “stuff” that everything is made of
- force - a push or a pull
- motion - a change in the position of an object
- engineers - people who design and/or build things to solve problems
- engineering design process - a set of steps engineers use to propose solutions to problems



The Engineering Design Process

- blueprint - a design plan

## Materials List

- roller coaster from Day 4
- additional roller coaster track supplies
- Improve handout
- crayons or pencils
- building supplies (tape, scissors, glue, etc.)

## Activity Description

1. Revisit the student's roller coaster using the Improve handout. Guide the student in determining which improvements he/she wants to make to the coaster. These improvements may be structural or aesthetic based on his/her responses to the reflection questions from Day 4.
  - What is the first thing you would like to change about your roller coaster design? How do you think this will improve your coaster?
    - The student should record (if able) his/her idea on the Improve handout using words, phrases and/or pictures.
  - What is another improvement you would like to make to your roller coaster? Why do you think this improvement is needed?
    - The student should record (if able) his/her idea on the Improve handout using words, phrases and/or pictures.
2. Once the student has communicated and recorded all of his/her proposed improvements, provide the student with time, space, additional materials and adult support (as needed) to recreate his/her roller coaster based on his/her revised plan.
  - Reminder you can:
    - build only what you drew (i.e., If the revised plan shows one loop, the roller coaster can only one loop).
    - use only the materials labeled in the revised plan (i.e., if the tunnel is labeled as a paper towel tube then a pool noodle or other material cannot be used to make the tunnel).
    - build for \_\_\_\_\_ minutes (time allotment is flexible to your schedule/student's attention span).

## Closure

Once the student has finished recreating or the allotted time has elapsed, provide the student with time to retest the roller coaster. Assist him/her in recording the new results (i.e., video record using a phone, record on paper, etc.) Then discuss successes and struggles that he/she experienced during the Improve stage of the engineering design process:

- How was your roller coaster's test results the same or different than last time? Why do you think this happened?
- What improvements did you find easy? Why?
- What improvements did you find difficult? Why?
- What did you most enjoy about improving your roller coaster? Why?
- What was your least favorite part about improving your roller coaster? Why?
- If you had more time/materials/space, what would you improve next?
- Were there any materials you wish you had but didn't? Why?
- Do you have any new advice to give another student who is trying to design and create a roller coaster? If so, what would you tell him/her?

## Extension

Record a video of your final design and creation. Share with Arizona Science Center via Instagram @azscience for Facebook.

## Improve Handout

Proposed Improvement	What Problem It Solves

### Revised Plan with Improvements

Blank area for the revised plan with improvements.