Blast Off!

GRADES:
K - 4

DURATION:
Varies depending on the age group/grade, and the number of activities done.

LEARNING OBJECTIVES:
- Children will learn about Ohio astronauts.
- Children will be introduced to the Engineering Design Process with a hands-on activity.
- Children will develop their curiosity and problem solving skills.

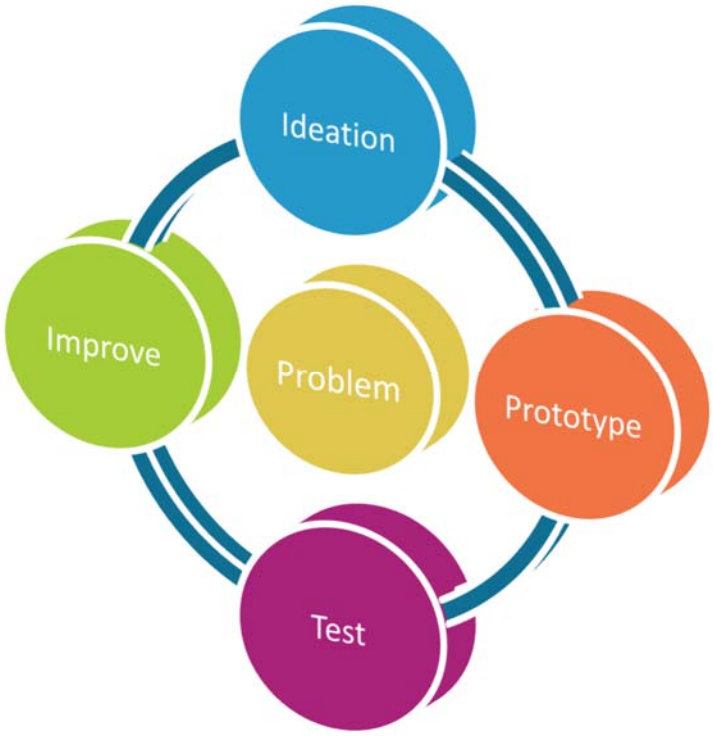
MATERIALS:
- Access to internet
- Access to DiscoverE's Rocket Challenge lesson plan

For each child or group:
- 1–5 lbs. non-hardening modeling clay
- Water
- Several targets (picture of Mars, the moon, bull's-eye, etc.)
- Tape measure
- 1 film canister with lid (you can still buy them online through Amazon.com or other retailers)
- 1 Alka-Seltzer tablet
- 1 plastic tray or shallow bin
- 1 set of safety glasses or goggles per child and helping adult

BACKGROUND INFORMATION:
For Children
In the history of space exploration, Ohio has been home to 25 astronauts! You can find great information about them on NASA's website. Among these many brave and impressive men and women, are John H. Glenn Jr. and Neil A. Armstrong.

For Adults
The design challenge activity is an opportunity for children to have fun, be creative and make their own prototype of a rocket. For students in grades 3 - 4, we recommend you explain the Engineering Design Process, which consists of a series of steps that guide engineering teams as they solve problems. There are many visual representations of the process like this one at NASA's website or this one from The Ohio State University. We have created a simplified one for you below. Basically, all challenges start with a problem. To solve that problem, teams brainstorm (ideation) to create solutions, then they create prototypes of their solution, test it, go back to their design and improve it. The steps of the process are repeated as many times

as needed, making improvements along the way as engineers find failures and uncover new design possibilities.



ACTIVITY OUTLINE:

1. Talk to your child about astronauts, space exploration and the Engineering Design Process, or have them read the background information on their own (refer to Background Information above). Let students explore the topic further using the sources provided or looking for more information independently. If you are not in or from Ohio, let children research astronauts from your state. NASA's homepage is an incredible resource. For younger children (grades K - 2), reading a book is a great way to introduce the activity. Suggested books, available through major retailers, include;
    - *If I were an Astronaut* by Eric Mark Braun
    - *Mae Among the Stars* by Roda Ahmed
    - *I am Neil Armstrong* by Brad Meltzer and Christopher Eliopoulos
2. Once the activity has been introduced, lead children through DiscoverE's Rocket Challenge lesson plan during which they will create their own "rocket". Here are some tips for running this activity:
    - Do this activity outside.
    - Adult supervision is required. Allow children the freedom to create their "rocket" but adults should "launch" them (dropping Alka-Seltzer in canister, closing it, and place it on "launching pad").
    - Although the "blast-off" happens quickly, delays might occur if the canister is not properly sealed or if the piece of Alka-Seltzer is too small. In this case, be patient and only approach

the "failed launch" after at least 30 seconds. Don't let kids approach the launching pad and be sure to wear goggles at all times!
- Do not use a whole Alka-Seltzer tablet for one blast-off. It will make the reaction too fast and strong.

ONE MORE THING:

Let us know how it went! Tag us on social media or email us at education@ohiohistory.org.