

Montshire at Home: Teacher Guide

WEEKLY THEME: CHAIN REACTIONS – Use your imagination to create a series of cause and effect events that accomplish a fun and simple task in a wonderfully complex way.

MONTSHIRE AT HOME is a series of learning activities, resources and short videos, developed, hosted and curated by the Montshire's Education team. It's designed to support children, families, and teachers with easily accessible concepts, content, and materials while learning at home.

Teachers can use these materials to support remote science learning opportunities for their students at home. Below is a suggested learning progression using this week's theme, activities, and resources found on the Montshire's Online Resource web page.

SUGGESTED LEARNING PROGRESSION

Day 1: Introduction to Chain Reactions and Materials Search

EXPLORE

- ▶ What is a Chain Reaction?
- ▶ What is potential energy?
- ▶ How can energy be transferred between objects?

DISCOVER

- ▶ Find materials and toys to help spark your imagination and begin by building simple chain reactions with 2-3 energy transfers.

Example - A toy train rolls down a ramp, starts a domino chain of cereal boxes, the last box falls on a spoon handle balanced like a seesaw, and the spoon flings a ball into the air.

- ▶ Gravity is your friend. There are many ways to release an object from a higher location –lever, string, knocking a precariously balanced board –can all release an object from a higher position, and gain potential energy.

Day 2: Building Bigger

EXPLORE

- ▶ How can you tell a story with chain reactions?

DISCOVER

- ▶ A theme can help spark building and idea generation. Or pick a final action the machine must accomplish. Like Rube Goldberg devices, the end result should be simple, but encourage the in-between actions to be as absurdly complicated as possible! Start sketching out a plan for a reaction with 5-10 steps.

EXTENSIONS

When we do chain reactions at the museum, each student link begins with the same mechanism that releases a large marble. This way, they all share a common element and can be easily linked together to create a large chain reaction.

If you want students to virtually link their chain reactions through a video, encourage them to have the same start and end action, such as knocking over a book or block (think large domino). That way each individual video can be edited together to look like they are connected.

View an example here – <https://youtu.be/eUQMwYRQCwo>

Day 3: Test, and test some more

EXPLORE

- ▶ What do you think Thomas Edison meant when he said, "I have not failed. I've just found 10,000 ways that won't work"?

DISCOVER

- ▶ Turning our ideas into reality often takes multiple attempts. The immediate feedback you get from actually testing your ideas will help move you along.

Day 4: Engineering Solutions

EXPLORE

- ▶ What problems did you encounter, and how did you solve them?

DISCOVER

- ▶ Have students share road-blocks and successes in the development of their chain reaction machines.

Day 5: Finale!

EXPLORE

- ▶ What was the most challenging part of your chain reactions?
- ▶ What are you most proud of from this project?



Scavenger Hunt: Chain Reaction Materials

The Montshire loves chain reactions! Chain reactions allow you to use your imagination in creating a series of cause and effect events that accomplish a fun, often simple task in a wonderfully complex way.

Building with common materials, but using them in uncommon ways, will challenge you and inspire your designs. And you'll play with science, too! You'll explore gravity, friction, balance, and more.

To build your chain reaction at home, begin by collecting your building materials. Here are some examples to help you get started.

Ideas for Materials



Things that build and topple



Things that roll and move



Levers and ramps



Other ways to get creative!

