



Egg Drop Resource Kit

Introduction

This kit was designed for small and rural libraries who want to hold an inexpensive, STEM-based egg drop program.

The Colorado State Library (CSL) has launched the *Let's Learn About It!: CSL Big Red Resource Kits* initiative to help small libraries within the state provide STEAM programming for their patrons at little to no cost.

Who is this kit for?

These activities and programs can be scaled for all ages and group sizes. Participants can go solo or form teams.

Why hold an egg drop challenge?

The egg drop challenge is a classic science experiment. Through it, children and young adults can experience abstract scientific concepts such as prototyping, motion and forces, energy transfer, the properties of materials, and the scientific method.

Families or groups can have fun working together to create prototypes!

Inside this binder

- Kit Contents checklist
- Supply lists
- Activities and program ideas
- Feedback form

- A list of other resources
- Sample handouts (printouts are available online or via the red key flash drive)

Feedback

Please help us improve this kit by sharing your comments, experiences, and suggestions. You can contact Madison Basch (basch_m@cde.state.co.us) at any point along your journey. When you return the kit, please fill out and include the Feedback Form found at the end of this binder.

We will update this kit's Online Resources page <https://cslkits.cvl sites.org/stem-discovery-kits> with the ideas and activities your library shares. Help us learn from your experiences and share that learning with others.

Loan period

The loan period for the Egg Drop Resource Kit is 2 months. If you would like to keep it longer, please contact Madison Basch (Basch_M@cde.state.co.us) to make arrangements before the loan period expires. If it is not on hold for another library, we will do our best to extend your loan.

Please note: **Kit contents are not intended for circulation outside of the library to individual patrons.**

Returning the kit

As you prepare to return the kit, verify that it is complete using the Kit Contents Checklist in this binder. Be sure to include your completed Feedback Form so that we can improve the experience for everyone.

We know that materials may get damaged in transit or by patrons. If that happens to you, please contact Maddie Basch (Basch_M@cde.state.co.us) and let us know right away!

Kit Contents

Please verify that this resource kit is complete before returning it to: Colorado State Library, Madison Basch, Courier Code 912.

You may copy any of the pages from the binder, or download a copy from the red key-shaped USB flash drive. You can also find information on <https://cslkits.cvlites.org/stem-discovery-kits>. Contact Madison Basch (Basch_m@cde.state.co.us) with any questions.

Items

- 1 red resource kit binder containing:
 - Kit instructions, sample handouts, and equipment user manuals
 - 1 red key-shaped USB flash drive containing printable documents
- 1 clipboard
- Sample RAFT Colorado egg drop kit (please do not use)
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- Yellow stopwatch
- Kitchen scale
- Laser tape measure
- 12 safety scissors
- Black camera case containing:
 - GoPro Hero (2018) camera (dark gray), in removable protective frame
C3321124804987, SKU#CHDHB-501
 - Micro SD card (8GB, inside GoPro)
 - Black charging cable
 - Black screw-in base
- Yellow hand grip with screw-in base for GoPro

Supply Lists

What you need

Not everything on this list is essential for your event. The beauty of the egg drop challenge is that you can use low-cost and recycled materials. Participants can work as families, in teams, or solo to accomplish their goals.

The essentials

- Raw eggs! (Plan to have enough for each individual or team to use at least two.)
 - Sealable plastic snack bags (keeps things clean!)
- Ladder or other high place(s) to drop experiments from.
- String or yarn (a range of colors makes great-looking projects!)
- Tape (patterned, colorful, and/or double-sided)
- Handouts for instructions

Optional materials ~~mix~~ and match!

The more variety and color your supplies have, the better-looking your projects will be! You don't have to have large quantities of everything if you decide to limit the number of items each individual or team participating can use. Many of these things are inexpensive or can be found for free.

- Plastic sheeting/painter's dropcloths to contain messes
- Straws
- Folders (manila or green file folders)
- Newspaper
- Shoeboxes
- Cardboard (flat and tubes)
- Sponges

- Paper towels
- Paper cups
- Plastic bags (snack, sandwich, grocery, etc.)
- Plastic bottles
- Balloons
- Plastic Easter eggs
- Tongue depressors/popsicle sticks
- Packing peanuts (but not too many!)
- Cotton balls
- Toothpicks
- Paperclips
- Rubber bands
- Pipe cleaners (aka chenille stems)
- Fingerpaints
- Washable markers
- Pencils/pens
- Foam pieces
- Feathers
- Silk flowers
- Small cloth samples

Basic Egg Drop Challenge

Introduction

The goal is for participants to work together and build a container that successfully keeps their egg from breaking when it is dropped. Introduce the rules and explain why the scientific method will help them in their quest.

Intended Audience

Recommended for all ages! Especially great for family groups.

Activity Goals

- Each individual or team builds and tests a device or container to keep an egg from breaking during a drop from a chosen height (or set of heights).
- Teams try to predict the outcome of each project's fall.

What staff need to know

This is intended to be a low-pressure, creative program. You may want to prepare a brief introduction to help everyone understand the rules you've decided on and to introduce the scientific concepts.

Let them know how you plan to define success - would a tiny crack in an eggshell pass or fail?

For the rest of the time, just interact with everyone and have fun!

- Check out the handouts in this binder for more ideas! The Other Resources list has links to resources about the scientific method and more.
- Be ready to act as an advisor, particularly for young participants. You may want to do a Tim Gunn, *Project Runway* style walk around to each group during construction.

Help them “Make it work!” (*Project Runway*: Hilarious Tim Gunn Mashup - <https://www.youtube.com/watch?v=RbMLXEAHHTo>)

- Ask each team to make predictions. Alternatively, you could do a prototype show and ask everyone to vote on which one they think will work best.
- Some participants will *really* want to make sure their egg breaks, and younger ones (or the young at heart) may want to throw an egg just for fun. Set up plastic sheeting to allow them to indulge after the contest with unused eggs.
- Most importantly, **use the GoPro to take plenty of photos and videos** ! (Make sure participants know that their images will be shared, and how to opt out.)
 - Designate a videographer who will handle the filming and any uploading, social media posts, and editing. It should *not* be the same person who is running the program.
 - If your videographer isn't familiar with the GoPro, do some testing to make sure everything works the day of. Review the product and safety instructions in the red binder. For other questions : <https://gopro.com/help>.
 - Download the **GoPro (formerly Capture)** app in advance for an IOS or Android device.
 - Make sure the GoPro is fully charged the night before the program.
 - Take more pictures and videos than you think you'll need!
 - Save photos or videos to a library device as soon as the program is over. (Transfer them wirelessly or onto a computer using the black charging cable.)
 - Print and create physical displays with photographs of projects and participants.

Alternative activity designs

There are countless ways to hold an egg drop program. Choose a way that you think will work best for your library.

Add limits or variations to make it a true challenge, especially if you have a lot of older participants:

- Use the stopwatch to limit the teams' time to construct their project.

- Set a weight limit for each project, or use the kitchen scale to see if heavier/lighter prototypes are more successful.
- Fill a box with a large amount of materials, then allow each person to choose only 3 items for their design.
 - Allow people to choose their materials individually, then team everyone randomly to see how their choices work together!
 - Use the Northeastern University “Egg Drop Activity” handout to make each group “budget” for the materials they want to use.
- Try dropping the egg from increasing heights. Will it eventually break?
 - Drop over grass first, then concrete.
- Try a *reverse* egg drop. This means you drop an egg from a pre-set height *into* a project designed to keep it from breaking. All the supplies can be the same!

Extension activities

Prizes - Who will have the best project, prettiest project, least tape used, most accurate predictions, quickest construction, etc.? The prizes can be as simple as bookmarks, or just bragging rights in social media or on the library display board.


Iteration - Allow teams to revise failed designs and try again - iteration is an important part of prototyping and testing hypotheses.

Decoration - Let participants decorate the eggs. They can use paint or washable markers to give a little personality to their experiment subjects.

Promotion

Make a plan for promoting this activity or program. Your plan doesn't have to be extensive, but it should address:

- Age range for attendees;
- Budget;
- Any existing library marketing or branding guidelines;
- How you will promote the activity, which could include:
 - Social media
 - Website
 - Email newsletter
 - Printed materials like posters or bookmarks

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- Cross-promoting with partner organizations
 - Local news media
 - Creating promotional materials, such as graphics, press releases, or printed materials;
 - Timeline

Feedback Form

Instructions

Please help us improve this Egg Drop Resource Kit by completing either this paper feedback form or the online version, found at <https://cslkits.cvlisites.org/stem-discovery-kits>. If you are completing the paper form, please return it with the kit.

Part 1: Evaluation

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I am satisfied that the resources in this kit met the library's needs.					
This resource will help improve library services to the public					
The loan period was adequate.					
I would recommend this kit to another library.					

Which parts of the kit did you find useful, and why?



Were there any parts of the kit that your library didn't use ? Why not?

How can we improve this kit?

Part 2: How Your Library Used the Kit

Please describe any of the activities or programs you used from this kit. Be as specific as possible. Include links, comments, and/or evaluation data when available.

** Want another way to keep the conversation going and share your experiences with others? Visit our forum on the CSL Resource Kit website

(<https://cslkits.cvlites.org/discuss/>) and share what you are doing there.**

Other Resources

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Where else you can find this information

We have included a red flash key with this kit. It is a USB flash drive containing pages from this binder and other resources. Updated resources can be found at <https://cslkits.cvl sites.org/stem-discovery-kits>.

General

WEBSITES

Khan Academy (<https://www.khanacademy.org/>) - This website includes plenty of videos and written materials to help teach participants about the scientific method.

- ➔ [The scientific method paper](https://bit.ly/2Q8j9z2) (<https://bit.ly/2Q8j9z2>)
- ➔ [The scientific method videos](https://bit.ly/2RsfuMo) (<https://bit.ly/2RsfuMo>)

University of Rochester - The link contains a brief introduction that may help library staff create their talking points about the scientific method.

- ➔ [Introduction to the Scientific Method](https://bit.ly/1dgyvoL) (<https://bit.ly/1dgyvoL>)

Resource Area for Teaching (RAFT) (<https://www.raft.net/>) - The website has many, many lesson plans for STEM-based activities. With a membership, you can purchase pre-assembled egg drop kits and other low-cost programming materials.

- ➔ Egg drop idea sheet (http://raft.education/activity_kits/egg-drop/)
- ➔ Other Idea Sheets & Activity Kits (https://raft.net/resources/#idea_sheets)

Buggy and Buddy - (<https://buggyandbuddy.com/>) - A website full of ideas for activities with kids, and lots of free printable materials created by educator Chelsea.

➔ Egg drop project ideas (<https://buggyandbuddy.com/stem-kids-egg-drop-project/>)

PRESENTATIONS

From Northeastern University:

➔ The Egg Drop Project (https://prezi.com/rnxs3h_gvygr/egg-drop-prezi/)

➔ The Reverse Egg Drop Project (<https://prezi.com/fkcimouza6sq/reverse-egg-drop-prezi/>)

For inspiration

Lemon Lime Adventures

Educator and mom Danya blogged about her experience creating an egg drop project with her children. She includes links to other resources and plenty of pictures.

➔ Part 1: https://lemonlimeadventures.com/creating_perfect_egg_drop_project/

➔ Part 2: https://lemonlimeadventures.com/engineering_egg_drop_project/