

# SLINGSHOTS, CROSSBOWS, & CATAPULTS, OH MY!



**STUDENT WORKBOOK**



ACTIVITY

1

# EXPLODING POPSICLE STICKS

Set up a popsicle stick chain and watch it launch gummy bears!

## I POPSICLE STICK CHAIN REACTION

### WHAT YOU NEED:

### FROM THE KIT:

- 40 popsicle sticks
- Gummy bears, pack

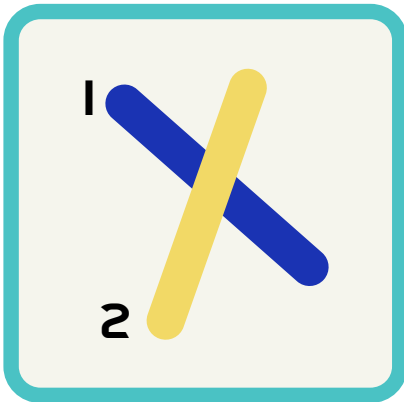
### WARNING:

WARNING! CHOKING HAZARD - Small parts.  
Not for children under 3 years.

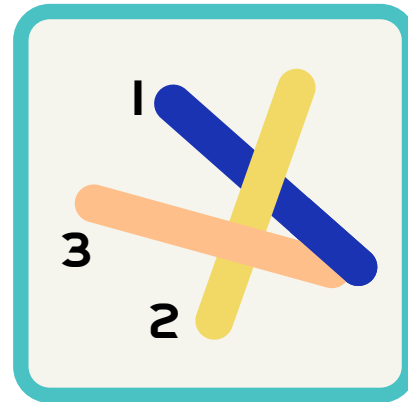
WARNING! DO NOT EAT OR DRINK anything in this kit.



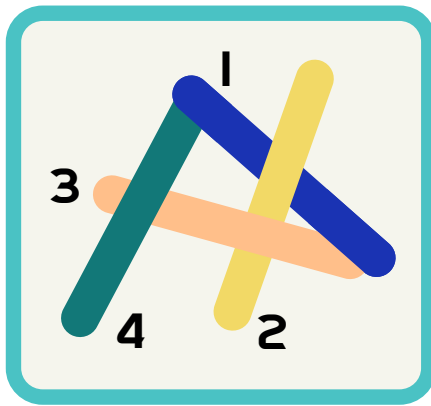
### WHAT TO DO:



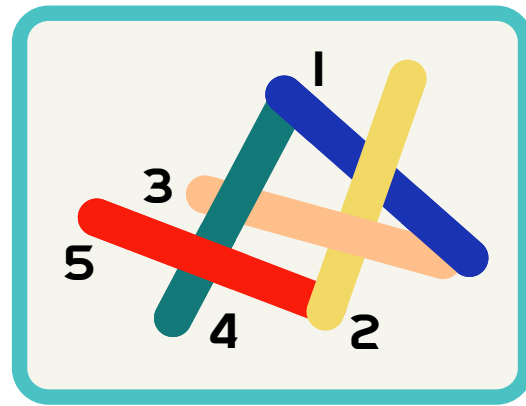
**STEP 1** Make an "X" with two popsicle sticks. The popsicle stick on the bottom is #1 and the popsicle stick on top is #2.



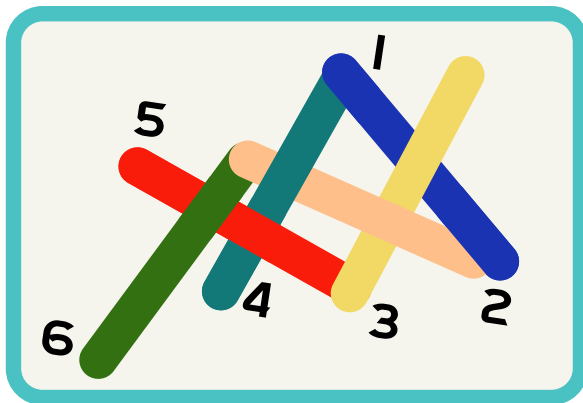
**STEP 2** Put popsicle stick #3 under #1 and over #2.



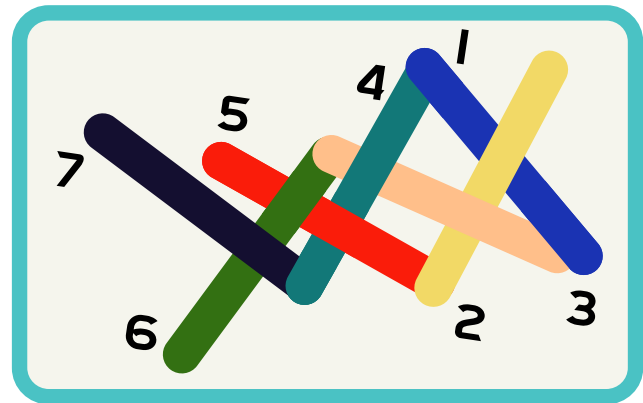
**STEP 3** Put popsicle stick #4 under #1 and over #3.



**STEP 4** Put popsicle stick #5 under #2 and over #4.



**STEP 5** Put popsicle stick #6 under #2 and over #5.



**STEP 6** Put popsicle stick #7 under #4 and over #6.

**STEP 7** Have one person hold popsicle sticks #1, #2, and #3 down while the second person repeats this pattern for the remaining popsicle sticks. Make sure the second person is holding the most recently placed popsicle stick down.

**STEP 8** Once the popsicle sticks are all used, place the 12 gummy bears from one pack on the popsicle stick chain in places where the popsicle sticks are touching.



**STEP 9** Remove all hands from the popsicle stick chain at the same time.

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**STEP 10** Watch the gummy bears as you release the popsicle stick on the end.

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**STEP 11** Repeat if you want to watch the movement of the gummy bears again.

*Note: Save the popsicle sticks for future activities.*



## REFLECT

? 1. What happened when you released the popsicle sticks?

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? 2. What direction did the gummy bears move in?

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? 3. What are two questions you have about the exploding popsicle sticks?

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# LAUNCHING INTO THE FUTURE

There is a lot more to learn about simple machines. Here are some other activities you can use to learn more!

## TREBUCHET TIME

DIY PROJECT

15

A trebuchet is another type of launcher, originally developed in Siena, Italy in the early 15<sup>th</sup> century. It was designed to destroy the great walls of enemy palaces. Today, we don't use trebuchets in this way but they can still be fun to build and learn about.

### WHAT YOU NEED:

- Box the kit came with
- Gummy bears
- Paperclip
- Scissors
- Tape measure
- Popsicle sticks
- Masking tape
- Rubber band
- Pencil
- Target



### WHAT TO DO:

1. Hold two popsicle sticks together to form a "V" and use masking tape to secure them together.
2. Tape a popsicle stick to the middle of the "V" to form an "A".
3. Tape two popsicle sticks, one to each leg of the "A" to hold the "A" up freely.
4. Repeat Steps 1–3 to make a second "A".
5. Cut out a flap from the cardboard box.
6. Tape the "A"s to the cardboard piece so they are side-by-side and 10cm apart.
7. Place the pencil on top of the "A"s.
8. Secure each side of the pencil to its "A" with a rubber band. Note: The rubber bands should keep it from falling off, but test that it can rotate easily.
9. Secure a popsicle stick to the middle of the pencil with masking tape or a rubber band. The popsicle stick should be perpendicular to the pencil.
10. Unfold one end of the paperclip so you have two loops.
11. Tape one loop of the paperclip to one end of the popsicle stick.
12. Set up your target.
13. Place a gummy bear on the free loop of the paperclip.
14. Push the other end of the popsicle stick down quickly to launch the gummy bear.
15. Measure the distance and accuracy of your trebuchet.
16. Repeat Steps 13–15 twice.



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Kit	SU-SCCOHMY
Instructions	IN-SCCOHMYS
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