

# Science of the Season: Indoor Snowball Launcher

## Materials

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- Balloons
- Hot glue gun and glue sticks (you can also use duct tape)
- Small plastic cup
- Styrofoam balls (& other options like cotton balls, pompoms, balled up paper)



## Instructions

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### Create Your Snowball Launcher

- First, cut the bottom out of the plastic cup. Make sure to leave the rim for strength or else the cup will crumple. Trim off any jagged edges around the cut portion of the plastic cup.
- Next, tie a knot in the neck of a balloon. Then, cut the end off the balloon (not the knotted end!) and either tape or glue the balloon around the bottom (where you have cut the hole) of the cup.

### Get Ready to Play!

- Now to get ready to launch your snowballs! Place a snowball in the cup. Pull down on the balloon's knot and release to watch the snowball fly. Now...you can have a snowball fight indoors (our outside!) when there is no snow!

### Experiment

- Time to experiment! Try comparing different launch items to see what works best and flies the farthest. You can even take measurements and record data to extend the learning portion of this winter STEM activity.

### How Does a Snowball Launcher Work?

- The first law of motion states that an object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction unless acted upon by an unbalanced force. Our snowball isn't launching by itself, so a force needs to be created! That force is the balloon. Does pulling the balloon further create more force?
- The second law says that the acceleration of an object is dependent upon two variables - the force acting upon the object and the mass of the object. That a mass (like the styrofoam snowball) will accelerate when a force is placed on it. Here the force is the balloon being pulled back and released. Testing different objects of different weights might result in different acceleration rates!
- Now, the third law tells us that for every action there is an equal and opposite reaction! The force created by the stretched balloon pushes the object away. The force pushing the ball out is equal to the force pulling the ball back!