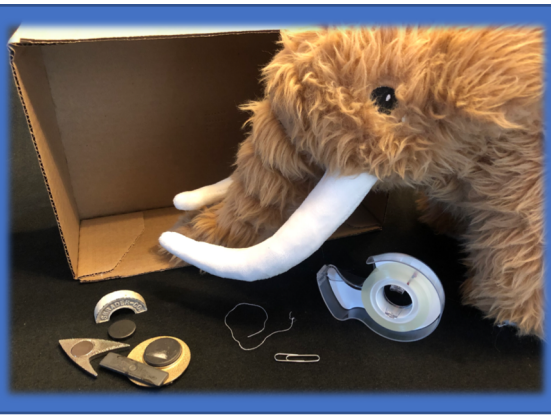
Science Saturday @ Home
Defying Gravity



Gathering Supplies:

Small Paperclip
Thread
Tape
Shoebox or Small Box
Different Magnets

Use magnetic force to defy gravity!

How To Steps:

1. Collect different magnets that you might have. Magnets have different strengths and for this activity you will want a pretty strong magnet.
2. Cut a piece of thread and tie one end to a small metal paperclip.
3. You can tape a magnet to the underside of the box (see picture), put the magnet on top of the box or both. Stacking magnets can increase their magnetic force.
4. Hold the paperclip up to the magnet with the string hanging down. Find the length of string that will hold the paperclip just below the magnet and tape the other end of the string to the box opposite the magnet.
5. Try slowly increasing the distance between the magnet and the floating paperclip. Remember you want a magnet or two that are pretty strong!
6. Don't give up! Keep trying different types of magnets, different magnet positions and see how you can float a paperclip and defy gravity!

WSC Science Saturday activities sponsored by a grant from Southern California Edison!

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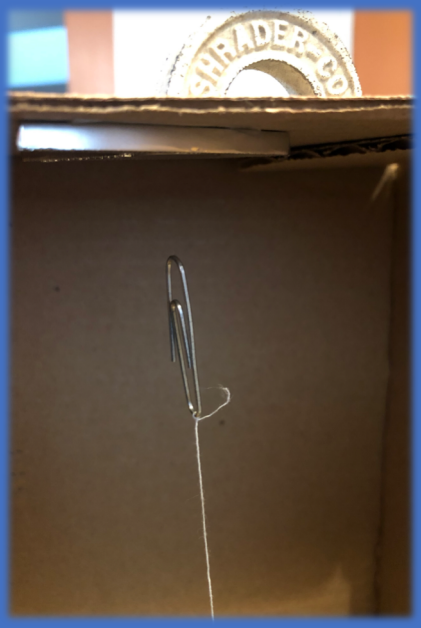
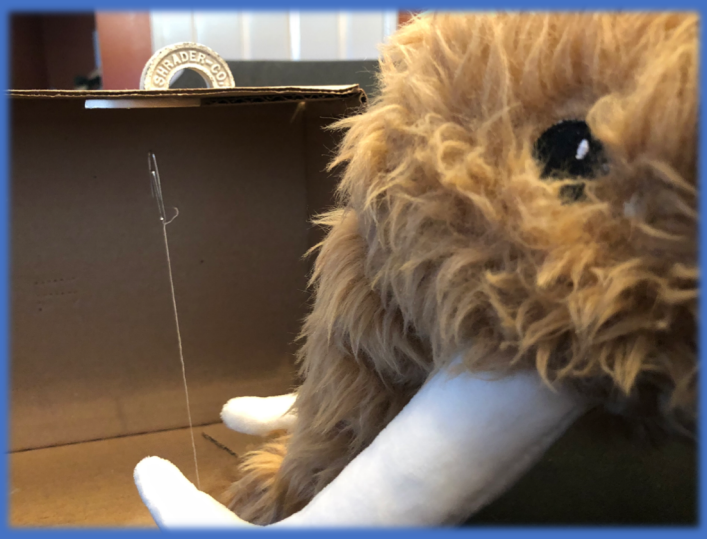
Defy Gravity with Max!





Did You Know?

Gravity and magnetism are different types of forces that act on objects here on earth.

Gravity pulls objects, including us, down towards the center of the earth. Sir Isaac Newton, during the 17th century, studied this natural force using the term gravity. In his writings on the laws of Universal Gravitation, Newton said that any object with mass has gravitational pull. The greater the mass the more gravitational pull. The earth's gravitational field is so strong because of the size of the earth. The thread and the paperclip are very small so have a very very very small gravitational pull. They will just drop to the ground unless we use another force that is stronger than the earth's gravity holding them down.

This is where the magnets come in. All magnets are polar, which means they have a positive (or *south*) and a negative (or *north*) end. Two ends of the same type will push apart, or repel. Two ends of opposite types will pull together, or attract. Objects that are always magnetized, like the magnets on your fridge, are called permanent magnets. Some permanent magnets are made of metals like iron and nickel. Other, more powerful ones are made from more exotic metals like neodymium or samarium. The metal of the paperclip is attracted to a magnet and will stick to it. The trick for this floating paperclip is to find a magnet with a strong enough force that the paperclip is pulled towards it, moving the thread and the paperclip against the force of gravity.