Sydney's Propulsion Station

Sydney, a friend of Jet's, has a passion for science fiction and imagination! She loves to discover new things and find out how things work! Sydney knows that aerospace engineering is the branch of engineering that design, build and operate launch vehicles, satellites, spacecraft, and ground-support facilities that are needed to explore outer space. This includes rockets, which can be powered by gases that are forced out of one end. Sydney wants to use her imagination to create a rocket that will allow her to see this for herself. Help Sydney discover Newton's Laws of Motion with this fun activity!

What you'll need:

- 6 feet of string
- 4 inch piece of drinking straw
- 9 inch round balloon
- Spring Clothespin
- Transparent tape
- 2 chairs

The Activity:

- Thread the string through the straw
- Tie the ends of the string to the backs of the chairs
- Position the chairs so that the string between them is as tight as possible
- Inflate the balloon. Twist the open end of the balloon and secure it with the clothespin
- Move the straw to one end of the string
- Tape the inflated balloon to the straw
- Remove the clothespin from the balloon.

What causes this to happen?

Sir Isaac Newton (1642 – 1727) described how a rocket works in 1687. There are three scientific principles that govern the motion of all objects, whether on Earth or in space. Newton's laws of motion gave rocket engineers with the basic knowledge to design modern rockets. So, a deflated balloon does not move because air pushes equally on all sides, inside and out. When inflated and closed; air continues to push on all sides and is balanced. When the balloon is opened up, the action-reaction pair of forces opposite the balloon's opening is unbalanced. One force pushes on the gas inside the balloon out of the opening. The other force is the gas pushing on the balloon's wall opposite the opening. This force pushes the balloon in the direction opposite of the opening.