MUSEUM OF THE ROCKIES

Rockets: Taking Off!

For every action there is an equal and opposite reaction.

Rockets and Balloons

What happens when you blow up a balloon then let it go? Does the balloon move through the air? Did you know that balloon and rockets have something in common? Rockets and balloons are both chambers enclosing a gas under pressure. The pressurized fuel inside a rocket is gas produced by burning solid and/or liquid fuels.

Action and Reaction

Let's think about the balloon again. What happens when you blow the balloon up and let it go? The air moves out of the opening in one direction, (action) while the balloon moves in the opposite direction (reaction). The same is true of rockets. Rocket fuel ignites at the base of the rocket and the gases propel the rocket into space, in the opposite direction.

Balloon Rocket

Mission:

Discover the action and reaction of a balloon rocket.

Experiment:

Step 1: Cut out the rocket shapes, decorate, and tape them to the straw.
Step 2: Inflate a balloon, but do not tie it. Instead, use the clothespin to clamp it shut securely.
Step 3: Thread the string through the drinking straw/rocket. Tape the long side of the balloon along the length of the straw/rocket.
Step 4: Have two students hold the ends of the string making sure the string is taut.
Step 5: Slide the balloon-straw assembly along the string until the clamped end reaches the wall or the end of the string held by a person.
Step 6: Release the clothespin!

Questions:

What is the action? The air (fuel) leaving the balloon in one direction.
What is the reaction? The rocket moving in the opposite direction.

Theorize:

A. What causes the balloon rocket to move?
B. What is the rocket's fuel?
C. In what direction is the fuel released?
D. In what direction does the balloon rocket move?
E. How could you make the balloon rocket move faster? Slower?