

F CUSED FIELD TRIPS

Eighth Grade Student Investigation

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ARIZONA
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CENTER 

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Eighth Grade Investigation

This Investigation contains activities on a variety of topics found throughout the Center. Exhibits are also sometimes removed temporarily for repair or refurbishment, or may be in use by other groups, so be prepared to be flexible.

Investigation Activities

Level I: All About Me in the Steele Foundation Gallery

Food for thought!

Through mechanical and chemical breakdown, food is converted into molecules that our body can use for energy.

Where to go

Food for Energy

What to do

Pedal the bike and see how fuel-efficient you are!

How does it feel to pedal?

Could you pedal for hours?

What's In Your Genes?

Each cell in the body contains about 25,000 to 35,000 genes, which carry information about who you are (called traits). By studying genes, scientists can learn more about how certain human characteristics can be passed on or inherited from person to person. Can you determine certain traits that may exist in your family's genes?

Where to go

You are Unique

What to do

As a group, have each member follow the directions on the computer. Fill in your answers to each question in the chart below.

| Trait | Do you have it? Can you do it? | Is your trait dominant or recessive? |
|-------------------|-----------------------------------|--------------------------------------|
| Long ring finger | | |
| Attached earlobes | | |
| Blue eyes | | |
| Widow's peak | | |
| Face dimples | | |
| Smelly hormone | | |
| Skin color | | |

Do you share any traits with other people in your group?

Level 2: Get Charged Up! in the Kemper and Ethel Marley Foundation Gallery

Downhill Race

Mass is the measure of how much matter an object is made of. Newton's Second Law of Motion states that the acceleration of an object increases with increased force or decreased mass.

Where to go:

Downhill Race

What to do:

Distribution of mass is important in this experiment. Adjust the gold weights on the two wheels so that one has the weights all towards the inner and the other wheel has them all towards the outer.

Before you roll them down the ramp, make a prediction:

Which wheel do you think will win the race? _____

Start the wheels at the top of the ramp and let go at exactly the same time. Which wheel wins? _____

Why? _____

Both wheels have the same mass and the same energy, but the wheel that has the weights placed towards the outer part of the wheel uses more energy to get started and has less to propel it forward.

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Take a Spin: Predict, Observe, Compare

Inertia is a "resistance to change of motion". What does this mean? The more inertia an object has, the less it responds to being pushed. For example, it's a lot easier to push a ping-pong ball than a bowling ball, because the bowling ball has more mass. The more mass in an object, the less it responds to being pushed.

Rotational inertia is the inertia of an object spinning on an axis. Just as objects traveling in a straight line want to continue to move in that straight line, rotating objects want to keep spinning. The rotational inertia of an object is directly related to its rate of rotation, or how fast it is spinning. This means that objects with large rotational inertia (larger mass) will require a large force to change its spin, while objects with small rotational inertia (smaller mass) will require only a small force

Where to go

Take a Spin Exhibit

What to do

1. Before you take a spin, can you predict what will happen if you move your arms and legs close to your body as you are spinning?

2. Spin! What happened?

3. Now, can you predict what will happen if you move your arms and legs away from your body? Try it. What happened?

4. Do you think that height has any effect on how fast you spin? Why or why not? Can you make a prediction as to who can spin faster - someone shorter or taller than you? Try it and compare! What happened?

Ball Launcher

This exhibit demonstrates two of Newton's Laws: Newton's second law of motion where the falling ball is only under the influence of gravity (free fall), and Newton's 3rd law which states that for every action, there is an equal but opposite reaction, which means that when the ball strikes the launch plate, the launch plate pushes back on the ball with a force equal in strength to the force it exerted, causing the ball to "launch".

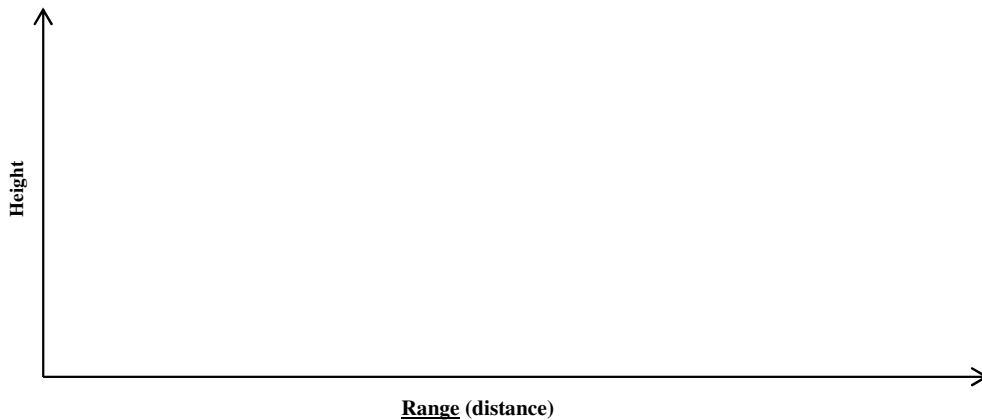
Where to go

Ball Launcher

What to do

Observe a ball drop without any hoops on the platform. Can you predict what will happen when you change the angle of the launch plate?

Draw a graph of the flight of the ball after it hits the plate?



Based on your observations, place the hoops on the platform. How many hoops can you get the ball to go through? Does changing the angle of the launch plate increase or decrease the distance the ball travels, and height of the ball flight?
