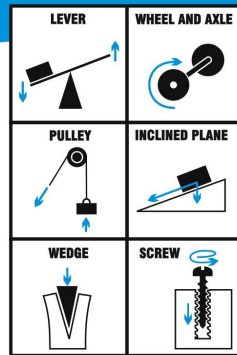


Today in Mad Science® we learned all about...
MAD MACHINES

- There are six simple machines. They make work easier.
- Inclined planes let you move loads up or down.
- Screws lift or hold things together.
- Levers lift or move loads.
- Wedges push things apart.
- Pulleys move things up, down, or across.
- Wheels and axles move loads.

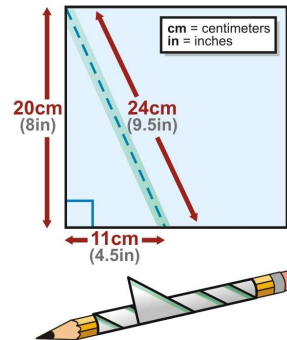


Let's Try This At Home!

DISGUISED INCLINED PLANE

YOU NEED: paper, ruler, pencil, scissors, marker, tape, adult helper

- 1 Ask an adult to help you measure and cut a right-angle triangle from a paper (see picture).
- 2 Use the marker to color the longest edge on the triangle you cut out.
- 3 Position the pencil along the triangle's shortest edge.
- 4 Roll the pencil to wrap the paper around it with the colored edge facing outwards. Tape the paper in place.



EXPLANATION: You made a model of a screw! A screw is a simple machine. Screws fasten things together. All screws have threads, or a curved track. You made the screw from a triangle. The long edge of a right-angle triangle is an inclined plane. A screw is an inclined plane wrapped around a center pole. An inclined plane is another simple machine.



Today in Mad Science® we learned all about...
KITCHEN CHEMISTRY

- Chemical changes happen both in the kitchen and in our bodies.
- Gas bubbles are a chemical change clue.
- A gas forms when yeast eats sugar.
- We get nutrients when we digest food.
- Starch is a nutrient that gives us energy.
- Protein is a nutrient that keeps our bodies working.

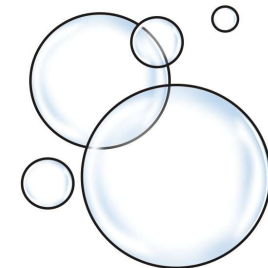


Let's Try This At Home!

BAKING BUBBLES

YOU NEED: baking soda, baking powder, cream of tartar, water, vinegar, 5 tablespoons, 3 small plates

- 1 Add one spoonful of baking soda to the first plate.
- 2 Add one spoonful of baking soda and half a spoonful of cream of tartar to the second plate.
- 3 Add one spoonful of baking powder to the third plate.
- 4 Now add half a spoonful of water to each plate. What happens?

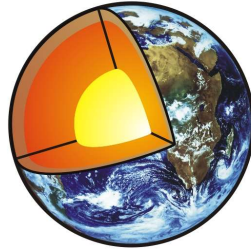


EXPLANATION: You're testing for a chemical reaction! Baking powder contains an acid (cream of tartar) and a base (baking soda). Adding water mixes the two chemicals together. This chemical reaction makes bubbles. Adding water to these two powders on the second plate also causes a chemical reaction. Baking soda alone does not react with water. It needs an acid to make bubbles.



Today in Mad Science® we learned all about...
EARTHWORKS

- Geologists study the Earth.
- The Earth is made up of three layers.
- The top layer is the crust, the middle is the mantle, and the center is the core.
- The top layer has moving plates that cause folds and faults.
- The three rock types are metamorphic, igneous, and sedimentary.
- Rocks are made up of minerals.



Let's Try This At Home!
COOKIE EXCAVATION

YOU NEED: small dish, bowl, 2 toothpicks, teaspoon, tweezers, 2 cookies with chocolate chips or other little bits in them, pencil, paper

- 1 Look at the bits (chocolate, nuts or fruit) in your cookie. How many do you think you can remove? Record this number.
- 2 Use the teaspoon, toothpicks, and tweezers to try to remove the bits without breaking the cookie. How many can you remove? How close was your guess?
- 3 Write down the number of bits you think you can remove from the second cookie. Add a spoonful of water, and try again to remove the bits. How does the water change things?



EXPLANATION: You're mining! Mining companies use tools to remove valuable deposits from the earth. These may include important rocks and minerals like granite, salt, gold, or fossil fuels like coal. Mining engineers work to figure out the best way to remove these deposits from the ground.



Today in Mad Science® we learned all about...
DETECTIVE SCIENCE

- A detective studies crime scenes.
- A forensic scientist gathers and tests evidence.
- Forensic artists use observations to sketch a suspect's face.
- Fingerprints and bite marks are unique. They can link a person to an event.
- Chromatography separates dark ink colors.
- Scientists can perform tests to identify unknown powders.



Let's Try This At Home!
CONTACT CONFIRMATION

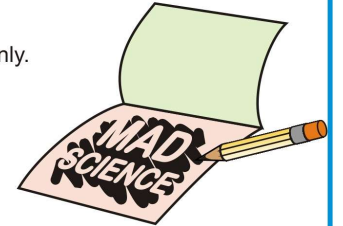
YOU NEED: 2 sheets of construction paper (different colors), white glue, pad of paper, pen, pencil, helper

PART A:

- 1 Glue two sheets of construction paper together evenly.
- 2 Press the sheets firmly together. Let the glue dry.
- 3 Try to pull the sheets apart. What happens?

PART B:

- 4 Have your helper use the pen to write a message on the top sheet of the pad of paper.
- 5 Flip to the second sheet. Rub the pencil lightly over the imprint. What happens?

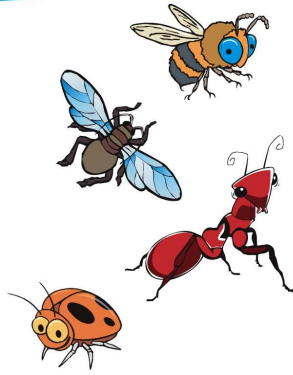


EXPLANATION: You tested Locard's principle. Dr. Locard believed that when two objects come into contact, they leave traces of themselves behind. A bit of each colored paper sticks to the other when you pull them apart. When you rub the pencil over the paper, you can see the imprint of the message. Locard's principle can help link a suspect to a crime.



Today in Mad Science® we learned all about...
BUGS!

- Entomologists study insects.
- Insects are part of the arthropod group.
- Arthropods have exoskeletons.
- All insects have a head, thorax, abdomen, and six legs.
- Insects see differently than we do. They have two eye types.
- Some insects pollinate plants.
- Insects adapt to live in their habitats.

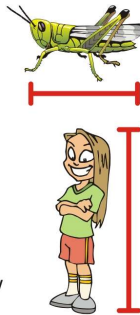


Let's Try This At Home!

LONG JUMP COMPETITION

YOU NEED: measuring tape, helper, chalk

- 1 Stand against the wall. Have your helper measure the distance from your head to your toes with the measuring tape. This represents your body's length.
- 2 Go outside. Use chalk to mark a starting point on the ground. Stand at the line, and jump as far as you can.
- 3 Use the chalk to mark where you landed. Measure how far you jumped.
- 4 Divide the distance you jumped by your body's length. How many body lengths did you jump?

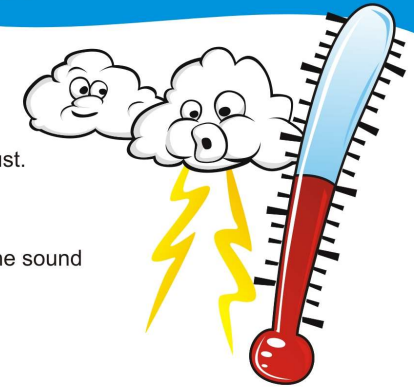


EXPLANATION: You probably jumped between one and two times your body's length! Grasshoppers are insects that can leap about twenty times their body's length. This is like an adult jumping from one end of a basketball court to the other. Grasshoppers can jump to get away from enemies.



Today in Mad Science® we learned all about...
WALLOPING WEATHER

- The Earth's tilt creates seasons. Seasons affect weather.
- Air changes mean weather changes.
- Clouds are made up of water drops and dust.
- Meteorologists study and forecast the weather.
- Lightning is an electric spark. Thunder is the sound that lightning makes.
- Too much ultraviolet (UV) light can cause sunburns.

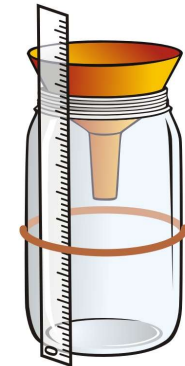


Let's Try This At Home!

TOOL TIME

YOU NEED: funnel (large enough to cover a large jar's mouth), large clear jar, clear plastic ruler, rubber band

- 1 Remove the empty jar's label.
- 2 Attach the ruler vertically to the jar with the rubber band. The zero on the ruler should be at the bottom of the jar.
- 3 Insert the funnel into the top of the jar.
- 4 Place the jar outside in an open spot on a rainy day. Read the ruler to measure the amount of rainwater collected in the jar right after the rainfall.



EXPLANATION: You made a pluviometer, or rain gauge! Meteorologists study the weather. They use tools to measure wind speed, temperature, and rainfall. A rain gauge is a tool that measures rainfall.



Today in Mad Science® we learned all about...
SCIENCE OF TOYS

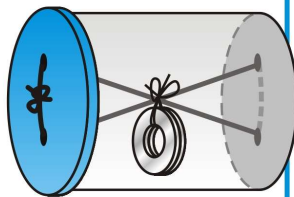
- Gravity is a force that pulls toys to the ground.
- Friction makes toys slow down or stop.
- Potential energy is stored in toys that are not moving.
- Kinetic energy makes toys move.
- Motorized toys can move on their own if they have energy.
- Electric toys stop working when there is a break in the circuit.



Let's Try This At Home!
THE BOOMERANG CAN

YOU NEED: coffee can with plastic lid, nail, hammer, large rubber band, scissors, string, 2 large metal washers, adult helper

- 1 Have an adult helper use a nail and hammer to poke two holes in the lid, and two more in the base of the can. The holes should be 5cm (2") apart.
- 2 Cut the rubber band, and thread the ends through the holes in the base. Pull them through the can and then through the holes in the lid.
- 3 Replace the lid and tie the two ends. Turn the lid to twist the band.
- 4 Remove the lid, and tie the washers around the middle of the band with string.
- 5 Replace the lid, and gently roll the can away from you. What happens?

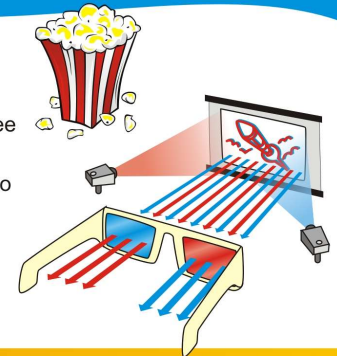


EXPLANATION: The can rolls back when you push it gently! Rolling the can twists the band around the weight. The twisted band stores enough energy to roll the can back to you.



Today in Mad Science® we learned all about...
MOVIE EFFECTS

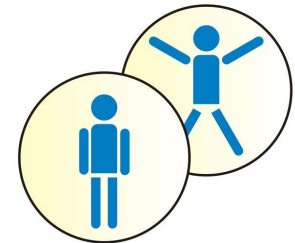
- A movie is a series of fast-moving pictures.
- You need good observation skills to make a movie.
- Three-dimensional (3-D) glasses make each eye see a different picture.
- Things seem to jump out in 3-D movies because two pictures overlap.
- Instant snow powder is a polymer used instead of real snow in some movies.
- Foley artists create sound effects for movies.



Let's Try This At Home!
SPINNING SCIENCE

YOU NEED: 2 white index cards, scissors, glue, tape, straw, crayons

- 1 Stack the two cards. Cut out a circle shape to make two circles.
- 2 On one circle, draw a person with their arms at their sides and their legs together.
- 3 On the other circle, draw a person with their arms up in a "V" shape, and their legs apart in an upside-down "V" shape.
- 4 Glue the circles back-to-back with the straw between them, so that it looks like a lollipop. Use tape to secure them.
- 5 Roll the straw back and forth between your hands. What happens to the pictures?



EXPLANATION: You made a model of a screw! A screw is a simple machine. Screws fasten things together. All screws have threads, or a curved track. You made the screw from a triangle. The long edge of a right-angle triangle is an inclined plane. A screw is an inclined plane wrapped around a center pole. An inclined plane is another simple machine.

