

20 Science Experiments

with
household items



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Experiment #1

INVISIBLE FORCE

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

- Plastic Soft Drinks Bottle
- Water
- Bowl
- Ice

INSTRUCTIONS

1. Ask an adult to heat water. Then pour the hot water inside the plastic bottle.
2. Leave the bottle open for 2-3 minutes and then screw in the cap.
3. Place the bottle down horizontally in the bowl. Then pour ice and cold water over it.
4. Pick up and place the bottle in the bowl so that it is standing upright. Observe.

RESULT

You will soon see the bottle getting crushed from the outside.



CONCEPT

The air around us has weight and it gives pressure in all directions at all times. Warm air is lighter than cool air. It also exerts less pressure. Therefore the air pressure outside the bottle is more than the pressure inside. This results in the outside air crushing the bottle.

Experiment #2

WHAT GASES ARE IN THE AIR?



MATERIALS FROM HOME

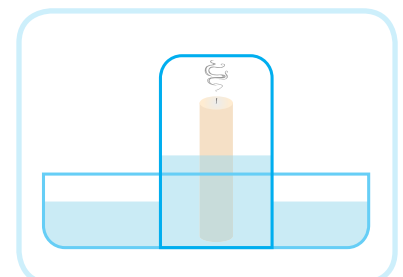
- Wide Flat Bowl
- Water
- Tall Thin Candle
- Glass

INSTRUCTIONS

1. Place the candle in the center of the bowl.
2. Pour some water into the cup.
3. Ask an adult to light the candle.
4. Place the glass upside down over the lit candle. Observe.

RESULT

The water level in the glass begins to rise. Then the candle flame goes out.



CONCEPT

The candle flame uses the oxygen in the air inside the glass. The water level rises to replace the vacuum made by the lack of oxygen. The remaining gas in the air is mostly nitrogen. The flame goes out as there is no oxygen left in the glass.

Experiment #3

PING PONG TWINS

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

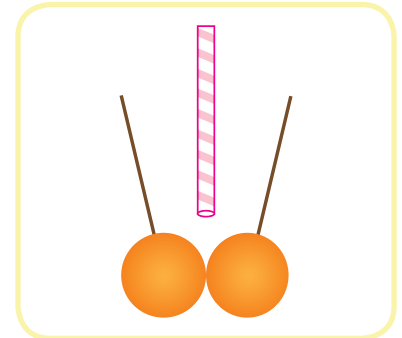
- Ping Pong Balls
- Cotton Threads
- Straw
- Adhesive Tape

INSTRUCTIONS

1. Take 2 ping pong balls and stick cotton threads to each of them using adhesive tape.
2. Hang the ping pong balls by sticking/tying the other end of the cotton threads.
3. Ensure both balls are hanging at the same height. The distance between the two should be 5 inches.
4. Bring a straw to the middle of the balls. Blow air through the stick.

RESULT

The ping pong balls come close to each other as you blow air in the middle of it.



CONCEPT

When you blow the air in the middle of the balls, the air pressure reduces, the air on the far side of the balls exert more pressure to the middle and this brings the balls closer together.

Experiment #4

WATERPROOF MATERIALS



MATERIALS FROM HOME

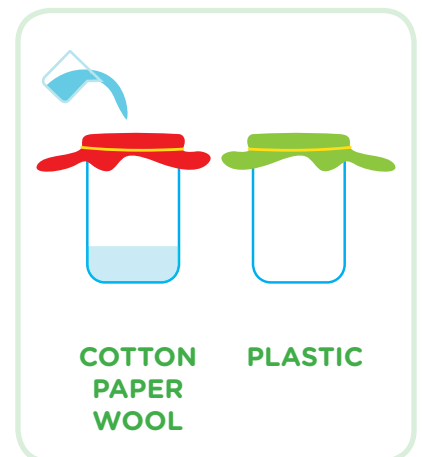
- Glass tumblers
- Scissors
- Pieces of Wool
- Paper
- Water
- Rubber Bands
- Cotton
- Plastic

INSTRUCTIONS

1. Cut out one circle each from the various materials. The circles should be slightly bigger than the mouth of the glass tumblers being used.
2. Take one circle and secure it over the mouth of the glass using a rubber band.
3. Slowly pour water on the circle and see if the water gets through.
4. Repeat this for all the materials. Record your observations.

RESULT

Plastic is waterproof and will not let any water through. Paper and cotton are not waterproof at all and will let water through easily. Wool holds water a little longer than cotton, but is not waterproof.



CONCEPT

The property of a material to be waterproof is very important if it is being used to protect something from rains. Find out what material your umbrella is made of.

Experiment #5

MAKE A FOUNTAIN



MATERIALS FROM HOME

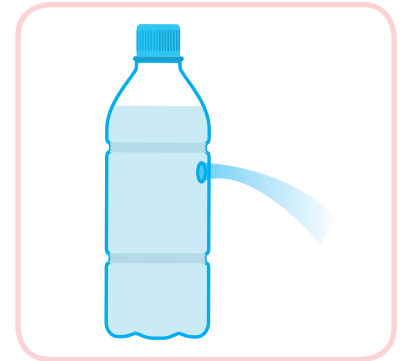
- Clear Plastic Bottle With Cap
- Water
- Pen

INSTRUCTIONS

1. Pour water into the bottle.
2. After the bottle is filled. Screw in the bottle cap tightly.
3. Lie down the bottle horizontally and pierce a hole in its side using a pen.
4. Now stand the bottle vertically and unscrew the cap.

RESULT

Water will flow out of the hole like a fountain.



CONCEPT

The water can't go out of the hole till the cap is unscrewed and new air comes into the bottle. This new air is needed to replace the space created with the water leaving from the hole.

Experiment #6

FLOAT OR SINK!



MATERIALS FROM HOME

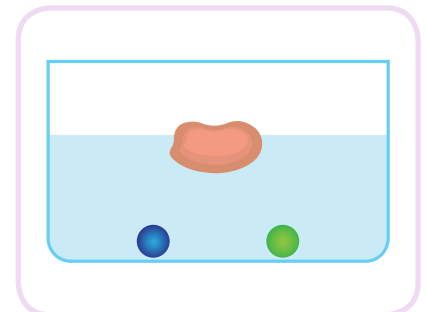
- Bowl
- Marbles
- Clay
- Water

INSTRUCTIONS

1. Fill the bowl with water.
2. Drop the marbles into the bowl.
3. Shape the clay into a boat.
4. Place the shaped clay gently on the water in the bowl.

RESULT

The marble balls sink to the bottom of the test tube. The clay boat floats on the water in the cup.



CONCEPT

The reason why the clay boat floats is because it displaces more water than the marble balls. The more water is displaced, more force gets applied by the water against the object, allowing it to float. Try dropping various objects into water to see if they float or sink.

Experiment #7

MAKE A SUBMARINE

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

- Glass
- Clay
- Pen Cap
- Water
- Thin plastic bottle with cap

INSTRUCTIONS

1. Attach a small piece of clay to the handle of the pen cap. If there is a hole in the tip, seal it with clay.
1. Fill the glass with water and drop the pen cap in it. Add or remove the attached clay till the pen cap is floating on the surface.
1. Fill the plastic bottle with water. Leave a little space at the top.
1. Put the pen cap inside the bottle and screw in the cap. Take the bottle with both hands and squeeze it from the sides. Observe.

RESULT

The pen cap sinks when the bottle is squeezed. It floats back up when you stop squeezing.

CONCEPT

The bubble of air trapped in the pen cap allows it to float. But when the bottle is squeezed, water enters the pen cap and the bubble becomes smaller. This forces the pen cap to sink. This method of adding and releasing water to float or sink is used by submarines to travel underwater.



Experiment #8

MAKE STALAGMITES & STALACTITES



MATERIALS FROM HOME

- 2 Jars
- Plate
- Warm Water
- Washing Soda
- Thread of wool
- Paperclips

INSTRUCTIONS

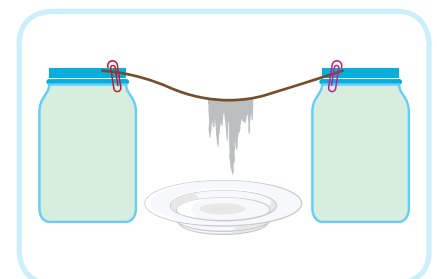
1. Fill both the jars with warm water. Mix washing soda in them until no more can be dissolved.
2. Attach one paperclip to each end of the wool thread. Insert the ends in the jars so the thread hangs in between.
3. Keep a plate in between the two jars.
4. Leave the jars for 1 week and then observe.

RESULT

A white stalactite is growing from the wool. A stalagmite is present on the plate.

CONCEPT

Water carries minerals with it as it flows and deposits the minerals where the flow ends. In this case the water carried the washing soda till the middle of the wool thread. The washing soda dripped down from the wool thread to form stalactites and stalagmites. This is the same reason for these structures to be found in many caves.



Experiment #9

HEAT CONDUCTORS

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

- Bowl
- Butter
- Plastic Spoon
- Beads
- Metal Spoon
- Hot Water

INSTRUCTIONS

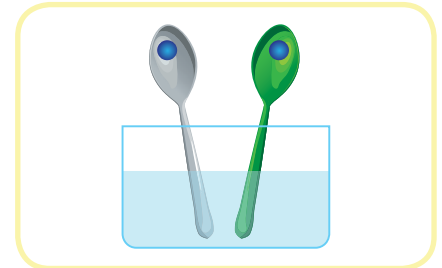
1. Place the metal and plastic spoon in a bowl with their heads standing out of the bowl.
2. Use butter to stick one bead to the head of each of the 2 spoons.
3. Pour hot water into the bowl.
4. Observe and see which bead falls first.

RESULT

The bead on the metal spoon falls first.

CONCEPT

The property of heat to travel through solid objects is called conduction. The materials in which heat spreads fast are called good conductors. Metal is a good conductor of heat. The butter on the metal spoon melts faster because metal is a better conductor of heat than plastic.



Experiment #10

MAKE YOUR OWN REFRIGERATOR



MATERIALS FROM HOME

- 2 Cups
- Flowerpot
- Glass Bowl
- Cold Water

INSTRUCTIONS

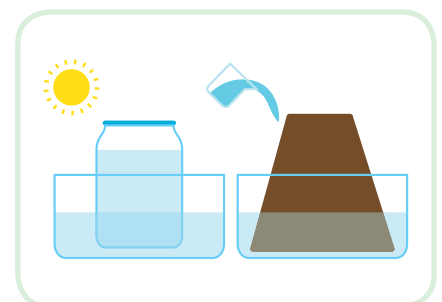
1. This experiment needs to be performed during a sunny day. Pour cold water in each of the 2 cups.
2. Place one cup in a glass bowl and cover it with a flowerpot. Pour cold water over the flowerpot until it is soaked.
3. Place the other cup and the glass bowl in the sunshine. Keep pouring some cold water over the flowerpot to prevent it from drying out.
4. After an hour, check the water from both cups. Which one is cooler?

RESULT

The water in the cup kept under the flowerpot is cooler.

CONCEPT

When water evaporates, it absorbs heat from surroundings. As the water on the flowerpot evaporates, it absorbs heat from inside keeping the water in the cup cool. Refrigerators use the same concept to keep things cool.



Experiment #11

MAKE YOUR OWN FLASK

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

- Big Plastic Container With Lid
- Small Plastic Container With Lid
- Aluminium Foil
- Hot Water
- Glass
- Adhesive Tape
- Hollow Block

INSTRUCTIONS

1. Cover the small plastic container with 2 layers of aluminium foil with the shining side facing inwards. Use adhesive tape to fasten it.
2. Pour hot water in both the small container and the glass. Close the lid of the container.
3. Place the hollow block inside the big plastic container and have the small container stand on it. Close the lid of the big container.
4. Take out the small container after 10 minutes and check the temperature of the water compared to the water that was left in the glass.

RESULT

The water in the container is still hot whereas the water in the glass has cooled down.



CONCEPT

Air is a bad conductor of heat. The air inside the big container does not allow heat to escape. Further the small container does not touch the ground and is closed at the top. This prevents further escape of heat.

Experiment #12

SLICING ICE



MATERIALS FROM HOME

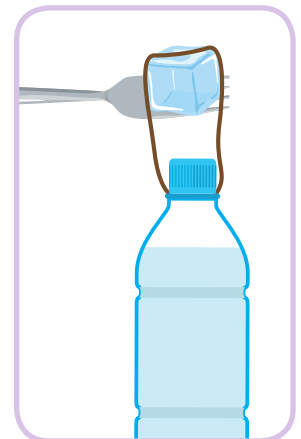
- Water
- Ice Cube
- Aluminium Foil
- Adhesive Tape
- Fork
- Plastic Bottle
- Thin Wire
- Heavy Book

INSTRUCTIONS

1. Use adhesive tape to stick a fork to the edge of a table so that the spikes are hanging in the air. Place a heavy book on the handle side of the fork.
2. Fill the plastic bottle with water and screw in the cap. Take a thin wire and make a loop and fix it right underneath the cap.
3. Place a small square of aluminium foil on the spikes of the fork. Then place an ice cube on it.
4. Place the wire over the ice cube such that the bottle is hanging below and pulling the wire down. The wire will cut through the ice cube and reach the foil. Pick up the ice cube.

RESULT

The ice cube is still in one piece.



CONCEPT

The pressure of the wire cuts the ice. But the moment the wire passes through the ice above it freezes back again.

Experiment #13

MAKE ICE CREAM



MATERIALS FROM HOME

- Chocolate Powder
- Milk
- Cream
- Salt
- Large Bowl
- Ice Cubes
- Tea Towel

INSTRUCTIONS

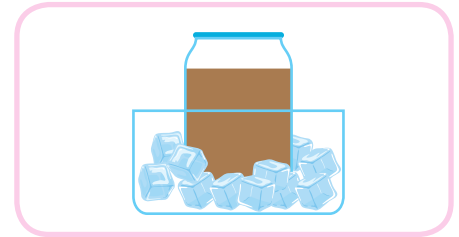
1. Add 1 scoop of chocolate powder, 2 scoops of milk and 1 scoop of cream in the cup. Mix well.
2. Place few ice cubes in a large bowl and sprinkle lots of salt over them. Place the cup on top of the ice.
3. Build more layers of ice cubes and salt around the cup.
4. Cover the bowl with a tea towel and leave it for one hour.

RESULT

The mixture in the cup has turned into tasty ice cream.

CONCEPT

When we add salt to ice, it melts ice but also makes it colder. Ice absorbs heat to melt into water. Water releases heat when turning to ice. At the freezing point of water, the heat released by water and the heat absorbed by ice are equal. But when you add salt, it lowers the freezing point of water. So ice melts into water absorbing heat but doesn't refreeze into ice releasing heat. So the temperature drops. Thus, when salt is added to ice, it makes the ice colder.



Experiment #14

FINDING RAIN LEVEL



MATERIALS FROM HOME

- Cup
- Small Clear Plastic Bottle
- Marker Pen
- Water

INSTRUCTIONS

1. Fill the cup with water and pour it inside the plastic bottle. Mark the water level in the bottle.
2. Repeat the above steps till you have 5-6 marks on the bottle. Then empty the bottle.
3. Keep the bottle outside at a place where it can catch raindrops.
4. After the rain is over, bring the bottle back in and check the water level.

RESULT

The water level in the bottle tells us the day's rainfall level.

CONCEPT

There are scientists who study water levels during rains to predict the weather. They are called meteorologists. Do you want to become a meteorologist when you grow up?



Experiment #15

SECRET MESSAGE

20 SCIENCE EXPERIMENTS

30
MINS

MATERIALS FROM HOME

- Lemon Juice
- Paper Sheet
- Bowl
- Candle
- Earbud

INSTRUCTIONS

1. Pour some lemon juice in a bowl.
2. Dip an earbud into the lemon juice and write a word on the sheet of paper. Let the sheet dry completely.
3. Ask an adult to light a candle.
4. Hold the sheet over the burning candle to warm it for a minute

RESULT

Message appears when paper is heated above candle flame.



CONCEPT

Lemon juice is acidic in nature. The acid remains in the paper even after the lemon juice has dried. The acid undergoes oxidation and turns brown when heat is applied.

Experiment #16

WHAT DO SEEDS NEED?

1
WEEK

MATERIALS FROM HOME

- Mung Bean Seeds
- Tissue Papers
- Bowl
- Water
- Saucers

INSTRUCTIONS

1. Place the seeds in a bowl full of water and leave them to soak overnight.
2. Place tissue papers over 3 saucers. Add equal amounts of seeds from the bowl to each of the saucers.
3. Add a little water to the first saucer. Add enough water to the second saucer so that it covers the seeds. Don't add any water to the third saucer.
4. Leave the saucers for a week in a warm place.

RESULT

The beans from the first saucer are the only seeds to grow properly.



CONCEPT

The first saucer has correct amounts of all 3 things that a seed needs to grow - air, water and warmth. The second saucer has too much water, which prevents the seeds from getting air. The third saucer has no water.

Experiment #17

CLEANING OLD COINS

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

- 2 Cups
- Liquid soap
- Wiping cloth
- Vinegar
- Old coins

INSTRUCTIONS

1. Take 2 cups and put one old coin in each of them.
2. Fill the first cup with vinegar. Add water and mix few drops of liquid soap in the second cup to make a soap solution.
3. Wait for 3-4 hours and take out the coins.
4. Wipe them with a dry cloth and compare the results.

RESULT

The coin from the vinegar cup is brighter.



CONCEPT

The dirt on coins is the product of a reaction between oxygen in the air and the metal in the coin. Vinegar separates this dirt from the metal in the coin.

Experiment #18

STRINGY ICE CUBE



MATERIALS FROM HOME

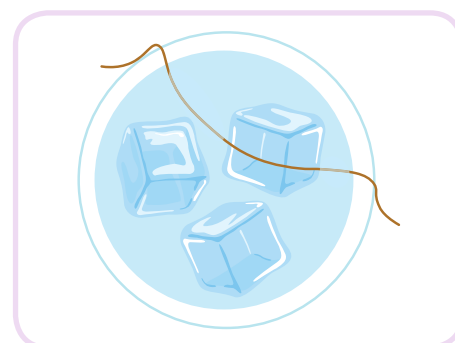
- Ice Cubes
- Bowl
- Common Salt
- String/Thread

INSTRUCTIONS

1. Take an ice cube and put it in a bowl of water. The ice will float to the top.
2. Carefully place a thin strip of string over the ice cube.
3. Sprinkle a good amount of salt over the ice cube and wait for 3 minutes.
4. Try pulling one end of the string. What do you observe?

RESULT

Ice cube is stuck to the string.



CONCEPT

When the salt comes in contact with the ice, it causes the ice to melt a little. The ice then quickly refreezes around the string. This causes the ice to stick to the string when it is pulled out of the bowl.

Experiment #19

MELTING RATES

20 SCIENCE EXPERIMENTS



MATERIALS FROM HOME

- Ice Cubes
- Coloured Paper Sheets

INSTRUCTIONS

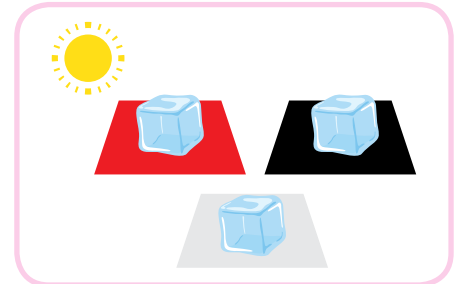
1. Take 3 paper sheets of black, white and red colour respectively.
2. Place all 3 sheets in the sunlight.
3. Keep one ice cube on each of them.
4. Observe which cube melts first.

RESULT

Ice cube on the black sheet melts first.

CONCEPT

Black colour absorbs the sunlight more and results in the cube to melt quickly. White colour reflects light and absorbs the least. Thus, ice on the white sheet melts the slowest.



Experiment #20

COLOUR CHANGING FLOWER



MATERIALS FROM HOME

- Glass
- Food colours
- Fresh White Flower

INSTRUCTIONS

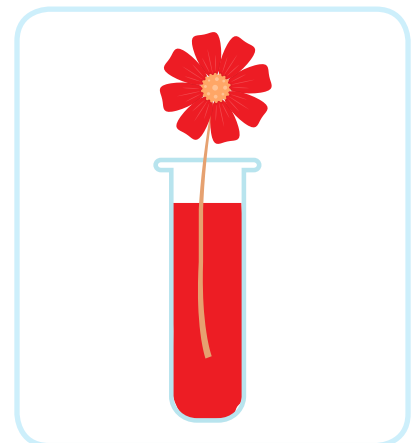
1. Cut the stem of the fresh white flower and put it in a glass. The flower should be above the rim.
2. Fill the glass halfway with water.
3. Add 4-5 drops of red or blue food colour to the water and leave it over night.

RESULT

The petals of the flower take the colour of the food colour added to the glass.

CONCEPT

The coloured water moves up the stem and reaches the petals. This property of water moving up narrow spaces against gravity is called capillary action.



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