

1. Read the instructions below and carry out the experiment described:

Egg-citing physics

Ingredients: a raw egg a hard boiled egg

Instructions

Place one egg on a flat surface and set it spinning.

Gently and briefly place your finger on the top centre of the egg. Then remove your finger.

Do the same with the other egg.

2. **What's happening?**

Describe what is happening. Write it down on a sheet of paper.

3. **How does it work?**

Try to explain this experiment. Write it down on a sheet of paper.

Help for questions #2 and #3

Fill in the following sentences

Egg-citing physics

What's happening?

The _____ egg stays still when you take your _____ off.

In contrast, the _____ is difficult to start _____ but will keep spinning when _____

How Does it Work?

Egg-citing physics

A raw egg is filled with a liquid, whereas a hard boiled egg is _____.

Firstly consider what happens when you stop the eggs: when you gently place your finger on _____, you stop the outer shell of both eggs from moving.

Since the hard boiled egg is _____, all of the egg stops moving, and so the egg _____ when you _____.

However, the _____ inside the raw egg will _____ even though the outside shell is stationary. The friction of that liquid on the shell will start the raw egg _____ again.

Similarly, a hard boiled egg is easier to spin since the entire egg starts spinning at the same time, whereas in the raw egg only the outer shell is spinning at first, and the stationary liquid is slowing it down. Gradually the liquid inside _____ as it is dragged around by the shell.

1. Read the instructions below and carry out the experiment described:

Alka-Seltzer rocket

Ingredients: empty film canister an Alka-Seltzer tablet water

Instructions

Place the Alka-Seltzer tablet in the film canister.

Add approximately 1 cm of water.

Fit the lid tightly on the canister.

Turn the canister upside-down and place it on a flat surface. Stand back!

2. **What's happening?**

Describe what is happening. Write it down on a sheet of paper.

3. **How does it work?**

Try to explain this experiment. Write it down on a sheet of paper.

Help for questions #2 and #3

Fill in the following sentences

Alka-Seltzer rocket

What's happening?

The _____ jumps into the air as the tablet dissolves in _____.

How does it work?

Alka-Seltzer rocket

When _____ is added to the Alka-Seltzer tablet, bubbles of _____ are produced.

When the lid is fitted tightly to the _____ this gas is contained within an enclosed space.

As more gas is produced the _____ inside the canister rises until there is enough force to overcome the seal of the lid. The built up pressure exerts _____ force to shoot the canister into the air, forming the rocket.

1. Read the instructions below and carry out the experiment described:

Straw oboe

Ingredients:

straws (need to be straight – cut off the bendy bits if there are any)
scissors

Instructions

Flatten one end of the straw ~2 cm from the end to the tip.

Make two cuts in the now flattened end of the straw, to form a triangular tip.

Insert the triangular tip of the straw into your mouth and blow hard. You should hear a loud 'buzzing' sound.

While you are blowing on the straw oboe, your fellow cuts the straw shorter, ~1 cm at a time.

2. **What's happening?**

Describe what is happening. Write it down on a sheet of paper.

3. **How does it work?**

Try to explain this experiment. Write it down on a sheet of paper.

Help for questions #2 and #3

Fill in the following sentences

Straw oboe

What's happening?

As the straw is cut _____, its sound is changing: the pitch of the sound goes up.

How does it work?

The flattened triangular tip acts like the reed found in most wind instruments.

Blowing on the reed causes the straw to vibrate. A sound wave is created along _____, which we hear as sound.

As you _____ the straw you shorten the wavelength of the sound wave and therefore increase the pitch of the note.

Straw oboe

1. Read the instructions below and carry out the experiment described:

Heavy newspaper

Ingredients:

a table with flat edge a ruler 2 sheets of newspaper

Instructions

Lay the ruler over the edge of the table so that ~1/3 of its length is over the edge.

Hit the ruler from above. As expected it flips off the table.

Fold up a sheet of newspaper as small as possible and place it at the back end of the ruler so that it acts as a counterweight. Hit the ruler from above.

Lay another sheet of newspaper flat on the table so that the back end of the ruler is roughly in the center. Hit the ruler.

2. **What's happening?**

Describe what is happening. Write it down on a sheet of paper.

Heavy newspaper

3. **How does it work?**

Try to explain this experiment. Write it down on a sheet of paper.

Help for questions #2 and #3

Fill in the following sentences

Heavy newspaper

What's happening?

When you place a folded up _____ on the ruler and then hit it, the ruler _____.

When _____

How does it work?

Heavy newspaper

Atmospheric _____ is exerting a downward force on the _____.

The surface area of a sheet of newspaper is quite large, therefore the downward force of the atmospheric pressure _____ on the newspaper is _____ enough to counter the upward force of hitting the _____.

It doesn't work with the _____ because the surface area over which the atmospheric pressure could act is _____.