

YEAR 5

PROFESSOR BUBBLEWORKS

Connections 2023
Working Scientifically



Year 5 Focus - Electricity

Introduction

We looked at a number of different demonstrations on your science day in relation to forces including some of all of these: Flying table tennis balls, Tennis ball launch and Bernoulli's windbags + more.

Write down your favourite demonstration below:

What new words did you learn?

Describe what happened:

What could we have done differently to potentially get a better result?

Name at least 4 in each box:

Types of forces

- 1
- 2
- 3
- 4

Famous scientists that studied force

Discuss in with a partner or group and write down the answer to these questions:

What factors affect gravity on objects?

Bernoulli principle focuses on which force?

Name some everyday items that use air pressure?

Experiment: Forces Experiments

Background science

If the force of gravity is stronger than the force of the rising air the objects will fall downwards. If the force of the rising air is stronger than the force of gravity the objects will shoot upwards. But... when the force of an air current pushing up and gravity pulling down become the same objects in the air current will float!

What factors will affect how long an object will stay in the air?

Weight (mass and gravity), upthrust and air resistance.

Where is there no air and little gravity?

In space (no air and little gravity). Moon – The moon has very little gravity (6 times less than earth). The moon has no air due to the lack of gravity to hold an atmosphere. Astronauts who visit the moon need their own air supply and heavy 'gravity' boots to help keep them from floating around.

Does anyone know a natural occurrence that produces powerful bursts of air?

Tornadoes, wind, hurricane.

Does anyone know a man made object that produces powerful bursts of air?

Jet engine, fan, rotor, leaf blower, vacuum cleaner etc.

Equipment needed

Item	Tips
Hairdryer	Powerful with cold setting
Table tennis balls	Up to 4 will be sufficient
Other items	Balloon, paper, soft toy, plastic cup etc

Experiment

Let's get hands on

Flying Objects

Instructions

1. Use a powerful hairdryer and table tennis balls
2. Turn on the hairdryer on the cold setting, hold steady and place a table tennis ball in the air stream.
3. How many table tennis balls can you place in the air at once?
4. What other objects can you float?

Review of Experiment

What's going on here?

So we made the balloons and balls float. Things float when the forces on them are balanced. Can anyone remember the name of the force that was pulling the objects down? (Gravity)

And who can tell me what was pushing the objects upwards? (Air pressure / Air resistance / Air current)
Brilliant! Air is a mixture of gases, and even though the particles in air are so tiny that we can't see them, when enough of them hit against a light object they can move it or make it float!

Taking it further

Please now focus on one of these experiments and use your working scientifically sheet to really understand more about what's going on.

Workshop Scientifically

In order to conduct a test we need to think and understand more about what's going on. We will now make this into an experiment using the sheets below. In order to make this into a fair test we need to run through the steps described.

Think about the following and choose something to test:

- Are you able to turn the hairdryer from side to side? How far can you turn it without the ball dropping?
- How many balls can you float at one time?
- Think about the power of the hairdryer, can you increase or decrease it?
- Why was there a change in floating height of the ping pong ball when you changed the speed of hair dryer?
- What other items can float? What are the main factors that affect whether it floats?
- Can you use some of these key terms in your answer: gravity, pull, push, balance, unbalanced, motion, pressure, air flow

Use these ideas above to think about what you would like to find out then create your own experiment. If you can't decide then why not do multiple experiments, you can even try these at home with an adult.

Title of experiment:

What problem are we trying to solve?:

Equipment needed:

Item	Quantity/Amount	Units

Method (what will you do):



Working Scientifically

Thinking: What do we already **KNOW**?

Questioning: Ask a testable **QUESTION**?

Planning: What are the **VARIABLES** in your investigation?

Independent Variable = What you are changing.
Dependent Variable = What you are measuring.
Control Variables = What you are keeping the same.

Predicting: Use what you already know to write a **HYPOTHESIS** that will answer your question.



Working Scientifically

Recording: What are your **RESULTS**?

Concluding: What **PATTERNS** do you notice?
Was your **HYPOTHESIS** correct?



Working Scientifically

Evaluating: Did you perform a **FAIR TEST**?

Evaluating: How could you improve your **METHOD**?

Evaluating: What could you **INVESTIGATE** next time?

