Warlingham School
& Sixth Form College

Wide Horizons
High Aspirations

Year 6-7 Transition

Science Project

Welcome to Science at Warlingham!

Dear student,

We hope that you are keeping well. Under normal circumstances, we would have loved to welcome you to our school at this time, to experience life at Warlingham. In particular, we would have loved to show you our science labs!

Unfortunately, circumstances do not allow this. However, we have put together three very simple experiments for you to try at home. These are the sorts of experiments that we are hoping to do soon after you start in Year 7.

Please read the instructions very carefully, in particular the safety information. All experiments must be completed with adult supervision.

We hope that you enjoy them and we look forward to seeing you soon!

The Science Department

Biology Experiment

Are enzymes in pineapples affected by cooking or freezing?

Introduction

Jelly contains gelatine, which is a processed form of collagen. Collagen is the most common protein found in humans and other mammals. When the gelatine is dissolved in hot water the bonds (connections) holding the collagen protein together are broken.

As the gelatine cools, new bonds form trapping the water between them, forming the wobbly jelly we love!

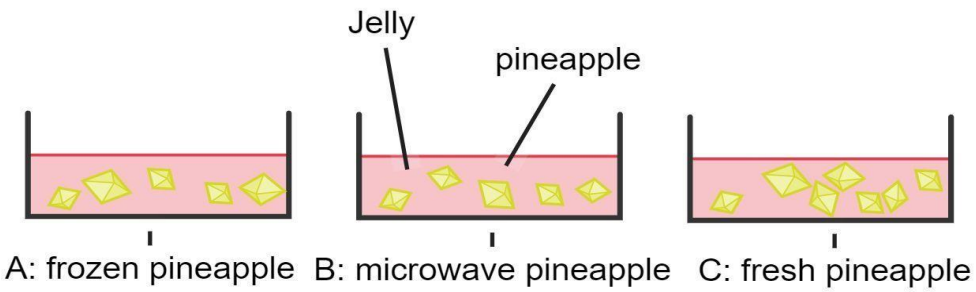
Pineapples contain enzymes that are able to break down the protein collagen and stop the jelly from setting. However, temperature can affect how well enzymes work; will high temperatures or low temperatures affect the enzyme the most?

You will need:

- Fresh pineapple
- Jelly crystals or cubes
- Access to a freezer/microwave
- 3 small containers e.g. yoghurt pots

Method

1. In this investigation, you are going to set up three experiments. Each one will have pineapple at different temperatures, which will then be placed in the raw jelly mixture. Experiment 1 will use frozen pineapple, experiment 2 will use microwaved pineapple and experiment 3 will use fresh pineapple. Before you start, think about how you will make your investigation fair. Make sure you read all the instructions including the safety information first.
2. Ask an adult to chop up your pineapple, put a few chunks in the freezer for 1-2 hours.
3. Microwave some pineapple chunks for 15-30 seconds
4. Ask an adult to boil the kettle and prepare the jelly
5. Place your pineapple chunks and jelly in the dishes as shown in the picture above. Make sure you know which is which.
6. Leave to set.



Safety – Adult Supervision required at all times!

Be careful when cutting the pineapple, students should be supervised at all times.

Take care when using boiling water.

Some people are allergic to pineapple. Use gloves or ask someone else to do the experiment if this affects you.

The Science

- Inside your digestive system there are chemicals called enzymes. These break down your food into smaller and smaller pieces so it can be absorbed into your bloodstream. E.g. an enzyme breaks down a starchy potato into simple sugars which are then moved around your body by your blood, giving energy to your muscles.

- Enzymes have a special shape which allows them to do their job. If this shape changes then they can't work anymore. Their shape can be affected by things like temperature.
- The enzyme in pineapple is able to stop jelly from setting.

Results

- Did all the jellies set? Which ones did not set? Can you explain these results?
- What do you think will happen if you use tinned pineapple?

Extension – make sure you understand the key words

What was your independent variable?

What was your dependent variable?

What were your control variables?

How did you make your investigation fair?

Find out about how enzymes work, use this information to explain your results.

Chemistry Experiment

Making a Natural Indicator

Introduction

Indicators are chemicals that can be added to a liquid to see whether it is acidic or alkaline. The indicator will change colour depending on whether an acid or an alkali is added.

Acids have a sour taste, like vinegar

Alkalis are things like soap and washing powder.

Acids and alkalis are found in a surprising number of places. Some are edible and are found in foods. Others are very strong and can be harmful, such as the acid in car batteries and the alkali in oven cleaners. Acids and alkalis are chemical opposites. In this investigation, you are going to make you own indicator which can be used to test household substances. This will allow you to identify them as either acid or alkali.

You will need:

- Red cabbage
- Sieve
- Hot water
- Some small containers to test your indicator
- Liquids/powders to test (e.g. orange juice, lemon juice, soap, washing powder are some examples)

Safety – Adult Supervision required at all times!

If you have safety glasses and gloves, please use them.

The red cabbage may stain, so wearing older clothes may also be a good idea.

CARE needs to be taken when pouring hot water as it can cause burns.

An adult should help with cutting up the red cabbage, as knives are sharp!

Method

1. Cut up the Red Cabbage into small pieces. (If you have a Pestle and Mortar you can crush the Cabbage up, or with adult help, you can use a blender or food mixer)
2. Pour hot water onto the Cabbage pieces and leave for a few minutes for the water to turn purple.
3. Pour the liquid through the sieve, into some small containers, (yoghurt pots are good for this!)
4. To each of your purple liquids, add one of your test materials, (orange juice, lemonade, crushed up indigestion tablets).
5. Write down what colour your purple liquid changes to with each material.

This is a link to a very similar method which you could watch first:
https://www.youtube.com/watch?v=OMXMlWybv8A

Results

Draw the tables below on a piece of paper and fill them in and answer the questions.

Material	Colour of Liquid
Water	
Soap	
Vinegar	
Lemon Juice	

Material	Colour of Liquid

- What colour did the Acids go? (The sour liquids)
- What colour did the soap go? Did other things you tested go the same colour?
- Make a copy of this table and fill it in for the other things you tested, identifying them as Acids or Alkalis:

Acids	Alkalis

Extension – do other colourful foods have the same effect?

Find out if Beetroot, Red onions, Blueberries etc. have the same effect.

Physics Experiment

Static Electricity

Introduction

Have you seen this happen before?

You are going to perform an experiment to investigate static electricity.

We are going to investigate how we can create static electricity and how we can change how much static electricity we make.

You will need:

- A piece of cloth (your old school jumper or a fleece will work well)
- A balloon
- A clock or a stopwatch (an adult will have a stopwatch on their phone)

Safety – Risk Assessment

You are going to be creating static electricity. If too much static is allowed to build up it can give you an electric shock or create a spark which may start a fire. In this experiment, the amount of static electricity is going to be very small and not harmful.

Try this…

Blow the balloon up and tie a knot in the end (ask an adult to help you).

Rub the balloon on your piece of cloth or jumper.

Hold your balloon very close to the top of your head (without touching it). What can you see? You will need a mirror for this or you can try holding it close to someone else's head.

What happens if you move the balloon around over the hair?

What happens if you touch their head with the balloon?

We are going to be a bit more scientific with our experiment now.

Method

- Rub the balloon on your jumper
- Stick it to the wall
- How long does it stay there for?
- How can we get the balloon to stick for longer? (Hint: what happens if you rub the balloon for longer before you try to stick it to the wall?)

What variable are we changing (independent variable)?

What variable is the outcome of the experiment (dependent variable)?

What variables are we keeping the same (control variables)?

Results

Write your observations onto a piece of paper.

When I rubbed the balloon and held it close to my/someone else's head:

When I rubbed the balloon and held it close to the wall:

Rubbing the balloon more before I held it to the wall meant that:

The longest time I got the balloon to stick to the wall for was:

The Science

All objects are made of atoms. Atoms are made up of even smaller particles. These particles can be positively charged (+) or negatively charged (-) just like the + and – written on a battery. The negatively charged particle is called an ELECTRON. When electrons flow in a circuit we call it an electric current. This is what makes your TV work.

Electrons can be transferred from one object to another by rubbing. When you rub the balloon on your jumper, electrons are transferred from one to the other.

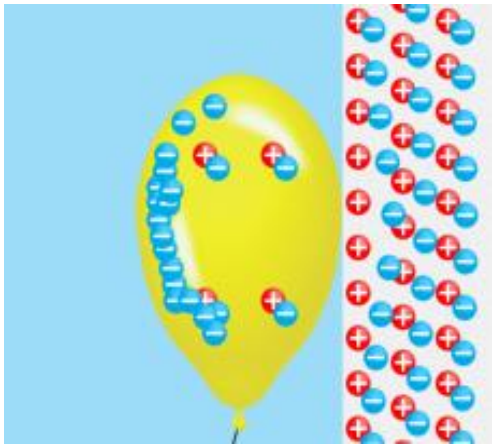
The electrons here are shown as blue circles with a white line inside.

When the balloon is rubbed on the jumper, the electrons move from the jumper to the balloon.

This build-up of electrons is called Static Electricity

The wall is also made charged particles.

The extra electrons on the balloon ATTRACT the positively charged particles in the wall. This is why the balloon sticks.



Extension

Can you think of any ways to change this experiment to make the results more reliable (better)?

Look again at the photo of the girl on the slide.

Her hair is covered with electrons. Can you explain how they got there? Can you explain why her hair is sticking out in all directions?

Extra Questions on the jumper experiment: What is the name of the positively charged particle (shown in red)?

Why does the balloon eventually fall off the wall?

Do NOT try this with your cat!