Science Project

Science is the study of the world around us. **Scientists** learn about their subject by observing, describing, and experimenting. At Birchwood High School you will study the science topics of **Biology**, **Chemistry** and **Physics**.

We have put some tasks together that will give you a sample of different aspects of the biology, chemistry and physics curriculum at KS3.

Biology is the science that studies life and living organisms.

ACTIVITY

Special features of birds

In your garden or a local park, choose a bird to watch closely.

Label the parts of the bird's body on the diagram.

Why do you think the birds need wings?

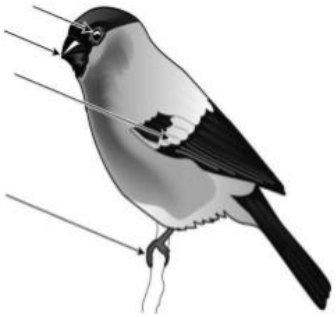
.....

Why does it have claws?

.....

Why does the bird have feathers?

.....



ACTIVITY

Parts of a leaf

On a visit to a park or on a walk, find a tree and collect a leaf. Use books or the internet to identify the tree from the leaf.

In the space below, draw the leaf and label as many parts as you can.

ACTIVITY

Local wildlife

Think about the living things that you might find in your garden, or in a local park. List as many organisms from your area as you can. Divide the list into producers, herbivores and carnivores.

Producers	Herbivores	Carnivores

DO TRY THIS AT HOME

The human heart

Answer these questions using what you already know about the human heart.

Where is the heart found in the body?

……

What does the heart do?

……

Your pulse measures how many times your heart beats in one minute.

- **Record your pulse when you are resting, and fill in the table.**
- **Now jog on the spot or do star jumps for two minutes.**
- **Measure your pulse again and fill in the table.**

Resting pulse (beats per minute)	Pulse after exercise (beats per minute)

What happens to your pulse when you exercise and why?

……

……

……

Chemistry is the science that studies the properties of matter (**Matter** is everything around you) and how matter interacts with energy.

Materials and Matter

Chemists make materials that are suitable for their purpose. In this activity, you will work out why objects are made from certain materials.

What to do

- Find five objects at home that are made from different materials.
- Fill in the table to show why the objects are made from certain materials. The first line is already filled in.

Object	Material the object is made from	Properties of the material that make it suitable for the object
frying pan	metal	• good conductor of heat • rigid

Sugar or salt?

In this activity you will plan and do an investigation to answer this question: **Can you dissolve more sugar or more salt into a glass of water?**

My plan:

- Complete the table

Variable	Will I change it, keep it the same or measure it?
Substance (salt or sugar)	
Amount that dissolves in water	
Volume of water	
Temperature of water	

My Results:

Substance	Amount that dissolves
Sugar	
Salt	

Write down what you will do (your method)

……

……

……

……

……

……

What did you find out?

……

……

……

……

……

……

Physics is a branch of science that studies matter and its motion as well as how it interacts with energy and forces. **Physics** studies small particles and atoms as well as the largest stars and the universe.

We use physics in lots of areas of our lives. Use what you know about science to help you carry out the tasks below.

Circuits

Can you draw a simple circuit that you would find in a torch? Include these things:

battery bulb switch

ACTIVITY

DO TRY THIS AT HOME

Density Rainbow

Density is a measure of how tightly packed molecules are in a substance. Density differences cause objects to float or sink.

If you have 5 different solutions that are all different colours and densities, the colours will layer on top of each other — the denser solutions will sit on the bottom and the lightest will sit on the top.

What you will need:

a glass
honey
milk
waters
vegetable oil
washing up liquid
pipette or syringe

Method:

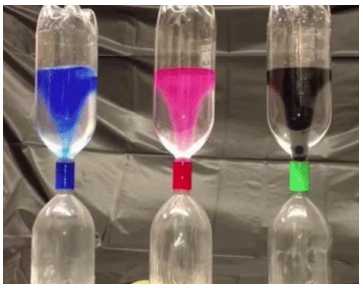
Carefully layer a small volume of honey into the glass (careful not to touch the sides)

Use a syringe or pipette if you have one to slowly and carefully add a layer of milk, washing up liquid, water and lastly vegetable oil. What do you observe and why?

.....

.....

Tornedo in a bottle



You can create your own tornado in a bottle. All you need is two l bottles, and some water.

When you whirl the liquid in the top bottle, it creates a vortex as it drains into the bottom bottle. That's because as the water flows down, air must flow up, creating a spiralling tornado. Add food dye for a colourful effect.

Which travels faster, sound or light?

What you will need:

Balloon
Pin
A helper
Funnel
Flour
Open space (garden)
Mobile device with slow motion recording

Method:

- Take a balloon, insert the funnel, and pour in 1 teaspoon of flour.
- Carefully inflate the balloon without breathing in the flour dust.
- Tie the balloon. Ask your helper to walk 100 large paces away
- With your camera on slow motion filming, ask your helper to pop the balloon. Record what happens.
- Play back your video. Watch and listen very carefully.

Record your observations:
Which travels faster, sound or light?

……
……
……

For a good demonstration of this, watch this video of lightning:
https://www.youtube.com/watch?v=0XXwn7DBiZ8#action=share

Phases of the Moon

Have you ever looked up at the sky and noticed how the Moon appears to change shape each night? Ever wondered why… And how?

Over the next 30 days, draw the shape of the moon. If you cannot see it one evening, make sure you look again the following evening and draw the new shape.

Date:	Date:	Date:	Date:	Date:
Date:	Date:	Date:	Date:	Date:
Date:	Date:	Date:	Date:	Date:

How do we see the moon?

The Moon doesn't emit (give off) light itself, the '**moonlight**' we see is actually the Sun's light reflected off the moon surface.

So, as the **Moon orbits the Earth**, the Sun lights up different parts of it, making it seem as if the Moon is changing shape. It's just *our view* of it that's altering…