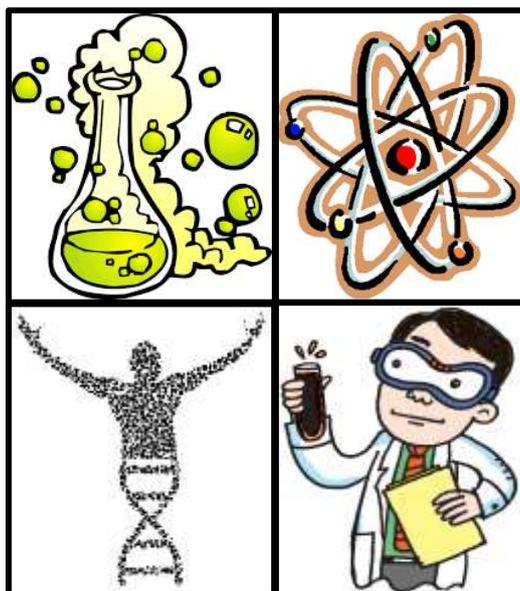




# S2 Science Booklet



Name: \_\_\_\_\_

Science Teacher(s): \_\_\_\_\_

Keep this booklet safe in your folder with your jotter.  
You must bring it to each science lesson.



## Welcome to S2 Science!

### Course Structure

Students in S2 attend science 4 times a week. We cover the CfE Science 3<sup>rd</sup> level outcomes and experiences through 9 mini topics followed by 3 thematic units. Skills development is a common thread, and Literacy, Numeracy, Health and Wellbeing outcomes are embedded within the course.

We begin the year with the following mini topics:

Block 1
Microbiology
Light
Reactions and Word Equations

Block 2
DNA
Physical World
Electricity

Block 3
Reproduction
Radiation
Acids and Alkalis

We then move onto the thematic portion of our course. We will begin learning about 'Life on Earth'. After that we will prepare for, and travel on, our mission into space to look for new life ('Living in Space'). We will finish the year on a new planet: 'New Earth'.



### Homework

Homework is an important part of the science course, it allows students to receive feedback on their learning and look at ways to improve. Homework may take the form of exercises, project work, creative tasks or revision. If you have no 'formal' homework, we recommend you review your learning from that week using your jotter notes and keywords list.

### Assessments

Students are assessed in science in a number of different ways. We use a combination of topic tests and practical investigations, along with open assessments.

You are given 1 revision period in class before an end of topic test and your science teacher(s) will show you different revision techniques to try out as the year progresses.

We find that the earlier our students pick up good revision habits, the more successful they are as they move up the school!

### Supporting study at home

We suggest the following website for revision:

<https://www.bbc.com/education/subjects/zq8myrd>

<http://www.scibermonkey.org/>

If you are finding the work in science class difficult, don't struggle in silence! Talk to us, we will help you.



### Progression

By the end of S2 you must be able to show a good understanding of the CfE level 3 outcomes to move onto level 4 in S3. When you move into S3 you choose from Biology, Chemistry and Physics: if you like, you can take all 3 sciences.

You will also continue to develop the S1/2 skills in our S3 courses, and this will prepare you for the National courses in senior phase.

**We hope you have an excellent year and work very hard!**

The Craigmount Science Faculty 😊

**Student declaration** (please read and sign by \_\_\_\_\_)

**I have read and understood the expectations and requirements in S2 Science.**

Student signature: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_



# Science Safety Rules

1. Do not enter a laboratory unless instructed to do so by a teacher!
2. Always listen carefully to instructions. Make sure you follow them!
3. Do not touch any equipment or chemicals until told to do so by the teacher!
4. Always wear safety goggles when told to do so and keep them on until all practical work including clearing away is finished.
5. When using a Bunsen burner, make sure that hair, scarves, ties etc are tied back or tucked in to keep them well away from the flame.
6. Always stand up during an experiment.
7. Do not push or run. Always act sensibly!
8. Do not eat or drink in a science laboratory!
9. Never taste anything or put anything in your mouth when in the laboratory. This includes sweets, fingers and pencils which might have picked up poisonous chemicals from the bench
10. If any chemicals get on your hands or any other part of the body, wash them off immediately and tell your teacher. Wash your hands after working with chemicals or with animal or plant matter.
11. Put waste solids in the right bin, never in the sink.
12. Report any accident to the teacher. This includes burns or cuts and chemicals in the mouth, the eyes or on the skin.
13. Keep your area clean and tidy and put bags under your desk.

## Microbes

What do you know already?

Biology

## Block 1

What are we learning about?

## Chemical Reactions

What do you know already?

Chemistry

## Light

What do you know already?

Physics

I'd like to find out.....

Keywords:

## Assessment evidence

Mini topic test

Homework

# Mini Topics- Block 1



## Learning Outcomes

### Microbes

At the end of this topic you should be able to:		Red	Amber	Green
1	What is a microbe?			
2	What are the three main types of microbe?			
3	Give an example of each type of microbe.			
4	Give examples of how micro-organisms can do us harm			
5	Give an example of one beneficial way micro-organisms are used.			
6	What are the essential resources micro-organisms need to grow and reproduce?			
7	What are the definitions of a bactericide/fungicide/germicide?			
8	What is the term for a chemical produced by living things that can stop other ones from growing?			
9	What is the type of microbe used to make yoghurt and cheese?			

10	What is the word equation for when bacteria convert the sugar in milk to yoghurt?			
11	What is the name of the reaction of sugar and yeast to make alcohol?			
12	Describe how to carry out the experiment to make alcohol and how the products are identified.			
13	What is the word equation for this reaction?			
14	What are the sources of sugar used to make beer, wine and cider?			

## Chemical Reactions

At the end of this topic you should be able to:		Red	Amber	Green
1	What is the difference between a physical and a chemical change?			
2	What is an everyday example of a physical and a chemical change?			
3	What are the signs that a chemical reaction has occurred?			
4	What is the definition of an element?			
5	What is the definition of a compound?			
6	What elements make up the following compounds? a) Magnesium oxide b) Hydrogen chloride c) Aluminium sulphide			
7	What is the name of the compounds produced from the following reactions? a) hydrogen and oxygen b) potassium and sulphur c) copper and chlorine			

8	Give two examples of compounds and describe how the properties are different from the elements they are made from.			
9	<p>What is the word equation for the following reactions?</p> <p>a) Iron reacts with oxygen to produce iron oxide</p> <p>b) Magnesium chloride is produced from the reaction of magnesium and chlorine</p> <p>c) Hydrogen bromide is formed when hydrogen is added to bromine</p>			

## Light

<b>At the end of this topic you should be able to:</b>		Red	Amber	Green
1	How does light travel through media?			
2	Can you explain what reflection is?			
3	Can you state the 'Law of Reflection'?			
4	Can you give an example of where reflection occurs?			
5	What is the normal, and can you draw this on a ray diagram?			

6	What are the angles of incidence and reflection, and can you measure these on a ray diagram?			
7	Can you explain what refraction is?			
8	Can you give an example of where refraction occurs?			
9	Can you draw a ray diagram for light passing through a rectangular block?			
10	What happens to light when it travels from material that is denser to a material that is less dense (glass to air)?			
11	What happens to light when it travels from a less dense to a more dense material (air to glass)?			
12	What are the 2 types of lens called? What are the other scientific terms you learned to describe these lenses?			
13	Can you describe what happens when light passes through these lenses?			
14	Can you draw ray diagrams to show what happens to light as it passes through these lenses?			
15	Which lenses can fix short sight and long sight? Can you explain why?			

## DNA

What do you know already?

Biology

## Block 2

What are we learning about?

## Physical World

What do you know already?

Chemistry

## Electricity

What do you know already?

Physics

I'd like to find out.....

Keywords:

## Assessment evidence

Mini topic test

Homework

# Mini Topics- Block 2



## Learning Outcomes

### DNA

At the end of this topic you should be able to:		Red	Amber	Green
1	Describe the structure of DNA.			
2	Describe the function of DNA.			
3	State the difference between DNA, genes and chromosomes.			
4	Describe the process of DNA extraction from kiwi fruit.			
5	What are the risks and benefits of DNA profiling?			

### Physical World

At the end of this topic you should be able to:		Red	Amber	Green
1	State the factors which can affect the rate of a reaction.			
2	Explain the effect of changing these factors in terms of the collision theory.			
3	State the effect a catalyst has on a reaction, and how they are affected by a reaction.			

4	State a definition for enzymes			
5	Circle what variable you changed when investigating rate of reaction: Temperature/concentration/ particle size			
6	Write a conclusion for your investigation.			

## Electricity

<b>At the end of this topic you should be able to:</b>		Red	Amber	Green
1	State what is meant by a series circuit.			
2	State how to measure current in a series circuit.			
3	Explain why the current is the same at all points in a series circuit			
4	State a definition for voltage.			
5	Explain how voltmeters and ammeters are connected in a circuit.			
6	State the difference between a series and a parallel circuit.			
7	Explain the rule for voltage and current in a series circuit.			
8	Explain the rule for voltage and current in a parallel circuit.			
9	Apply what you have learned to design, build and test a circuit that meets specific requirements.			

## Reproduction

What do you know already?

## Block 3

What are we learning about?

## Acids and Alkalis

What do you know already?

Chemistry

## Radiation

What do you know already?

Physics

I'd like to find out.....

Keywords:

## Assessment evidence

Mini topic test

Homework

# Mini Topics- Block 3



## Learning Outcomes

### Reproduction

At the end of this topic you should be able to:		Red	Amber	Green
1	Name and state the function of the main parts of the female reproductive system.			
2	Name and state the function of the main parts of the male reproductive system.			
3	Name the male and female sex cells.			
4	Describe the structure of the male and female sex cells			
5	Describe the route taken by sperm from the testes to the female body			
6	Name some substances that can pass from mother to foetus			
7	Describe some of the possible risks to the embryo during pregnancy			

### Acids and Alkalis

At the end of this topic you should be able to:		Red	Amber	Green
1	Identify some common examples of everyday acids and alkalis.			
2	Describe and demonstrate how different acids and alkalis have different pH values.			

3	Describe the different properties of acids and alkalis in terms of taste, feel and pH.			
4	Describe and demonstrate how to change the pH value of an acid or alkali through dilution.			
5	State a natural substance that can be used to make an indicator and state the colour changes observed.			
6	Design and safely carry out an experiment to show that red cabbage and red berries can be used as indicators and the colour changes observed.			
7	Demonstrate how to neutralise acids and alkalis and explain the process using a word equation.			
8	Describe a number of applications of neutralisation in everyday life and explain the chemical process.			

## Radiation

<b>At the end of this topic you should be able to:</b>		Red	Amber	Green
1	Carry out an experiment to show what happens when white light is spread out into a spectrum by a triangular prism.			
2	State a range of uses of radiations in the EM spectrum.			
3	Describe an application using of infra-red radiation.			

