UNIVERSITY OF BATH

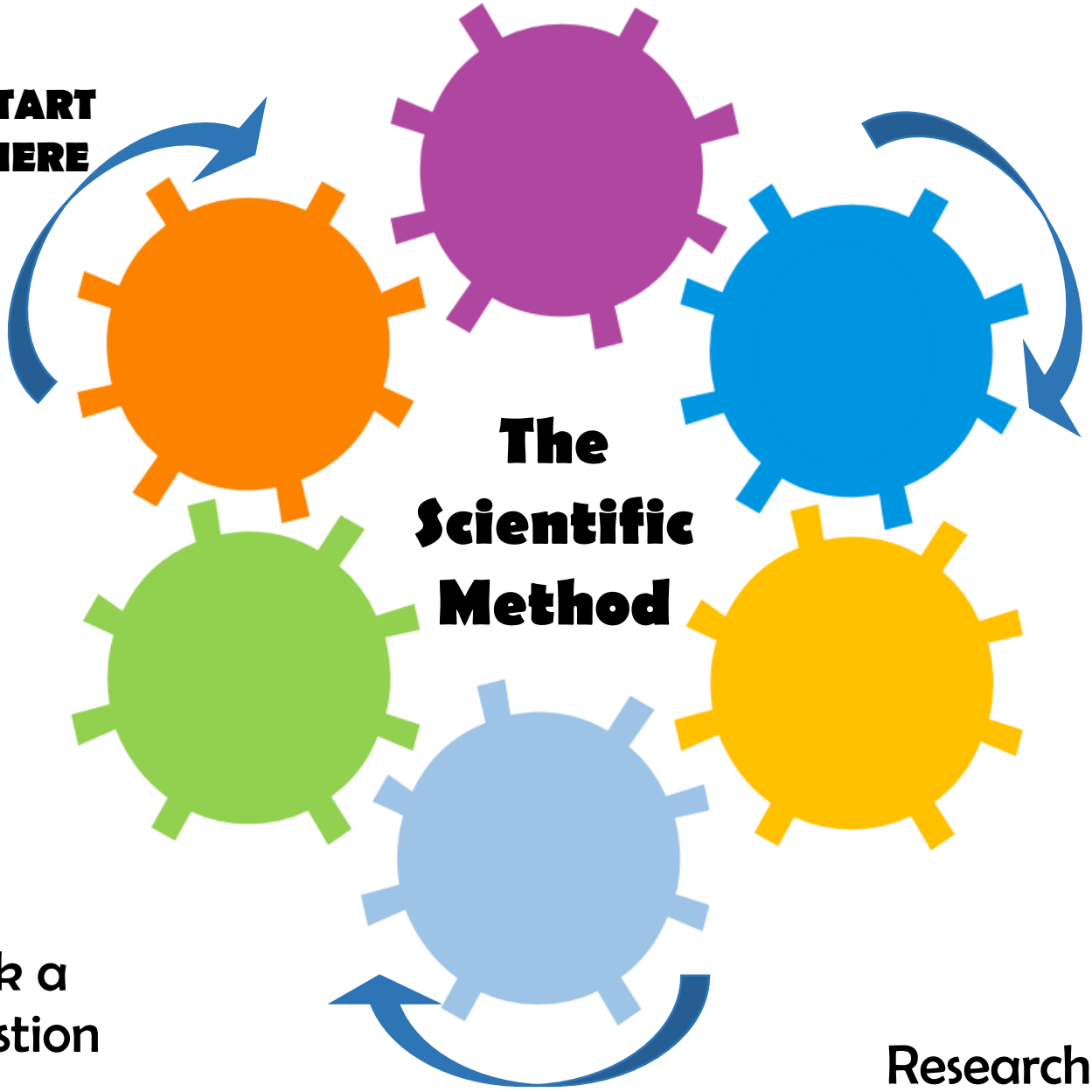
Science Project

Name:.....

Create a hypothesis

Collect your data

START HERE



The Scientific Method

Ask a question

Research your question

Design an experiment

Conclusion

Ask a question

- After choosing a topic it is important to create a scientific question that you can base your project on.
- It should be an interesting question that you want to work on for the next few weeks.
- It helps if it is focused so that you can answer it with a simple experiment.
- Science questions usually start with how, what, where, when, why, which or does.

My research question is

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Why do you want to do your project? How does it link to everyday life? Does it affect you or people you know?

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How could I find out the answer to my question?

What is the best way to find out the answer to my question and why?

Research your question

- It is important to research your project idea because this will help you decide how to carry out your experiment
- You can ask your friends, family and teachers or read about your topic online to help you find out more information
- Use the table below to help you organise your findings...

What I found out	Where I got the information from

Create a hypothesis

- Once you have come up with a question and read around the topic, you can create a hypothesis.
- A hypothesis is a prediction of what might happen if you try to test your problem.
- To help predict what will happen ask yourself the question – 'what do you think will happen in my experiment?'
- You have to be able to test your hypothesis experimentally as the next step will involve carrying out an experiment to prove your hypothesis correct or incorrect.

My hypothesis is

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How to make a paper airplane

Put the following sentences in the correct order:

Fold the angled edges into the centre

Fold down the two top flaps to make the wings

Get a piece of paper

Test fly your airplane and measure how far it has flown

Bring the angled edges together along the centre line

Fold the two long sides of a piece of paper together

Fold the top corners into the centre

Making the best paper airplane

Use the method above to make the best paper airplane. You will have paper on your table. After everyone is complete we will test to determine which is the best.

Refining your question:

Making the best paper airplane

When you set a question it is important to be clear about what you want to find out. The best paper airplane could have been the one that:

- flew the furthest
- flew the fastest
- looked the best
- was neatly folded

Review your question to see if there is any more explaining needed

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Variables

Match the word to the correct definition

Independent variable	Variables that remain constant throughout the experiment (as they are not measured)
Fair test	The variable you are measuring
Control variables	The variable you want to change
Dependent variable	Change one variable at a time whilst keeping all others the same

Identify the different variables from your paper airplane exercise

The **independent** variable is

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The **dependent** variable is

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The **control** variables in are

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How could you make the experiment a **fair test**?

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Example:

Independent variable (The variable you want to change)	The person
Dependent variable (the variable you are measuring)	Distance the plane flies
Control variables (Variables that remain constant throughout the experiment)	Size and shape of plane, material (e.g. paper), weight

This is a **fair test** because one variable is changed (the person) whilst keeping all other variables the same

Now let's apply this to your experiment:

Identify and group the different variables in your experiment

The **independent** variable in my experiment is

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The **dependent** variable in my experiment is

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The **control** variables in my experiment are

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I will make the experiment a **fair test** by....

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Design an experiment

Now you have identified your variables you can design an experiment to help you investigate your research question. Remember it must be a fair test! Use the space below to design your experiment.

List of materials

In this section you should write a list of everything you will need for your experiment. This is important because you will need to remember to bring everything when you start experimenting. Use the space below for a diagram if you would like.

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Experimental methods

This section involves writing a step-by-step recipe for your experiment. The scientific term for this is 'experimental methods'. A good methods section is very detailed and enables someone else to replicate your experiment (much like a recipe in a cook book).

Are there any health and safety risks with your experimental plan?

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Use this space to plan your time and organise who does what in your group.

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Why have you chosen this idea or approach to answer your question? You can use diagrams or words to explain this.

Collect your data

Before you start your experiment it is important to think about how you will record your observations. Preparing a table allows you to quickly write down your observations as they happen. Use this space to collect your data and analyse your results.

Use this space for data collection and analysis if you need to!

Drawing Conclusions

In your conclusion you should summarise your results and identify whether your results prove or disprove your hypothesis. Asking yourself the following questions can help when concluding your project...

What did you find out?

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What did you learn?

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Do your results prove or disprove your hypothesis?

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Was your project successful? Why? What went well in your project? Were you able to answer your research question?

What impact could your project have on other people? For example does it relate to environmental issues or provide a solution that may improve people's lives?

What would you do differently if you were doing this project again? Why? What could you have done to make this project even better?

Display board

Use a pencil to label the display board below...

Photos of the results or you carrying out the experiments

Materials

Catchy title

Results: including graphs

Trifold cardboard display board

Conclusion and future directions/ further experiments

Abstract: Summary of your research

Experimental methods/ procedure

Background research

Examples of materials used in the experiments that you can use to help you explain your research

Hypothesis

Clearly labelled sections with large text