Australian Government

ANSTO

Team members:

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Think Science! Logbook

Questioning and Predicting

Research Question

Write a **scientifically testable question** to show what you are going to investigate. Testable questions are about changing one variable or factor to see its effect on another variable.

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Show your question to your teacher. Do they approve of your investigation topic?

Teacher's initials ……

Background Information

Research the topic of your testable question and the science associated with your topic. Collect relevant information from textbooks, libraries and the internet. Explain any **scientific concepts** that are relevant to your investigation.
Present a **summary** of your research for the video – you should only allow about 30 seconds in your video to present your background information.

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Aim

Write an aim for your investigation. The aim states the purpose of your investigation, what you are setting out to investigate.

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Hypothesis

Based on what you know and what you found out from your background research, write a hypothesis. Your hypothesis is a **testable statement**. It is your prediction of what you expect to find from carrying out the investigation.

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Planning and Conducting

What variable are you going to change (independent variable), and what variable are you going to measure (dependent variable)? How are you going to change and measure these variables?

How can you make your investigation a fair test? Think about the variables you will need to keep the same, and how you will do this.

independent variable (what you will change and how you will change it)	**dependent variable** (what you will measure and how you will measure it)	**controlled variables** (the things you need to keep the same, and how you will keep each thing the same)

Does your experiment need a **control** that you can use to compare with your test results? If yes, describe what you will use as your control.

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Equipment

List all the materials and equipment you will need for your investigation.

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Risk Assessment

Identify any dangers to yourself or others associated with your investigation, and state how you are going to minimise each of these. Consider any ethical issues if your research involves animals or humans.

Risk or danger	What harm could this risk or danger cause to you or others?	Ways to manage and minimise the risk or danger

Method:

Describe a step-by-step procedure that tells us what you are doing, how you are going to do it and the equipment that you are using to do it. Don't forget to include a sufficient number of replicate trials to help ensure the validity of your data.
Remember to show the set-up of your equipment with a photo or diagram, so your audience can visualise what you are doing.

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Processing, Modelling and Analysing

Results:

Record what you observe and measure during your investigation (your raw data) in an appropriate way, such as a table. Don't forget to take some photos and/or video of your team carrying out your investigation and recording the results.

It is also good to present your results in other formats as well, such as an appropriate graph, photographs, or diagrams, to communicate your results in a visual way.

What do your results suggest? Describe any trends, patterns, relationship and anomalies you see in your results data.

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Evaluating

Discussion:

Referring to your previous background research and your knowledge of the topic, explain how your results agree or disagree with the scientific theory and concepts related to your investigation. What do your investigation results mean for people's everyday lives?

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Thinking about the equipment you used and your method, what difficulties or sources of error did you encounter in carrying out your investigation? Was it a fair test? Why or why not?
How could these issues have affected your results?

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What improvements would you make to your investigation to improve the fairness and quality of your data?

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Suggest any further research or actions that you think need to be carried out to extend this investigation and further our understanding of this topic.

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Conclusion:

Write a conclusion for your investigation. A conclusion is like an answer to your aim, and gives a brief summary of your findings. Does your conclusion support or disagree with your hypothesis?

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Communicating

Create a ***story board*** to show how you will communicate your investigation information in your video. Your story board should indicate each scene (what you will show to the audience) and what you will say for each scene. Remember to include each member of your team. You can use our ***storyboard template*** to help you!

Don't forget to use your creativity. Plan a video that tells us about your investigation in an engaging, enjoyable and fun-to-watch way.

The following ***storyboard checklist*** will help to ensure you have included everything you need in your video. Put a tick against each item to check you have included it in your storyboard.

Storyboard Checklist

Questioning and predicting

We have:

- ☐ stated the scientifically testable question or aim of our investigation
- ☐ presented a summary of the science and scientific concepts that relate to our investigation
- ☐ proposed an informed and testable hypothesis (what we think will happen based on our research)

Planning and conducting

We have:

- ☐ identified the independent and dependent variables (what we changed and what we measured) and stated how we measured them
- ☐ described how other variables were kept the same to ensure a fair test
- ☐ stated safety risks and any ethical issues for our investigation, and explained how we minimised these risks and issues (risk assessment)
- ☐ included photos or video to show the set-up of our equipment for our investigation (equipment)
- ☐ clearly described the logical steps we followed to carry out our investigation (method)
- ☐ included photos or video showing our team carrying out our investigation and recording the results

Processing, modelling and analysing

We have:

- ☐ presented an appropriate, well-organised table of all our observations and accurate measurements, including our trial averages (results)
- ☐ included an appropriate graph or photos of our results
- ☐ described any patterns, trends or relationships shown by our results, and identified any anomalies

Evaluating

We have:

- ☐ stated our conclusion, and whether or not our results support our hypothesis
- ☐ explained our results using our knowledge of the science and scientific concepts related to our investigation
- ☐ related our findings to the real world and suggested questions for further investigation
- ☐ reflected on possible sources of error in our investigation and stated how our investigation could be improved

Communicating

Now that you have checked your storyboard it's time to make your ***video.***
Try to make a video that is interesting, engaging and enjoyable for the viewer to watch, so they pay attention and learn about your great investigation! Don't forget- use your creativity!

So here is a checklist for your team to consider when you are making your video:

We are:

- ☐ filming in a quiet area so there is no background noise
- ☐ filming where there is enough lighting so that everything presented can be clearly seen
- ☐ looking at the camera when speaking and have only one team member speaking at a time.
- ☐ speaking loud enough and clearly enough for the viewer to hear and understand
- ☐ speaking at the right pace (not too quickly or too slowly)
- ☐ ensuring that any text, data tables and graphs presented on screen are large enough to be easily read and to clearly see all details
- ☐ allowing enough time for the viewer to look at and understand everything that is presented on screen
- ☐ including creative ideas and features to engage the viewer
- ☐ checking the spelling of all our text
- ☐ checking that our final version of the video is between 4 and 5 minutes long

Don't forget to watch your video before you submit it! This is very important. When watching your video, you should use the checklist again to check that everything you need has been included. This will enable you to edit your video if you have missed something.

HINT: it is a good idea to learn your investigation information so that you can look at the camera and talk directly to your audience.

EXTRA HINT: Play your video for your teacher, friends and family to get their feedback before submitting – they might notice something you missed that needs fixing!

Have fun telling us about your investigation! We can't wait to see it. 😊