

Working like a scientist

The science classroom, including the laboratory, is a stimulating place for students to learn about what it means to be a scientist. As we develop our students to think and act like a scientist you might consider empowering them in assuming some shared responsibility for their safety. This approach can help students develop a scientific habit of mind and may also support them in realising the contribution they can make in ensuring their safety and the safety of others. This is especially important with the added precautions necessary in the current conditions. To aid students in developing these skills and attitudes for shared responsibility, this resource offers an opportunity to explore the work of a scientist in different contexts.

Learning Outcome in Focus

Nature of Science 1: Students should be able to appreciate how scientists work and how scientific ideas are modified over time

Learning Intentions

By participating in this activity:

1. Students will deepen their understanding of what it means to work as a scientist
2. Students will appreciate the many different practices scientists utilise to ensure their safety and the safety of others
3. Students will begin to understand their own responsibility for ensuring their safety and the safety of others

Teacher Guidelines

Here is a collection of videos showing different people doing the work of a scientist. A summary of their work is also included. These might be used as prompts for students to:





- i) Consider the hazards of doing science in different contexts
- ii) Determine associated risk levels of these hazards
- iii) Begin to engage in hazards and risk assessment in Junior Cycle Science




To access the video, hold down the *Ctrl* button on your computer and click the image or the link. If you do not have access to the internet, students can still engage with the activity by using the summary of the work of the scientist.

A student worksheet is available supporting students to evaluate safety in different contexts. Students are encouraged to evaluate their own roles and responsibilities of safely working as a scientist.

An extension worksheet is available on page 6. This could be used to aid students in identifying hazards in places other than the science classroom.

A bookmark that supports students in thinking about safety is also provided.

| The work of scientists | Video link |
|---|---|
| <p>This scientist is investigating how to improve running techniques.</p> |  <p>Running techniques (4:08 min)</p> |
| <p>This scientist is gathering lava samples from a volcano to bring back to the lab to analyse.</p> |  <p>Investigating lava (4:03 min)</p> |
| <p>These scientists are observing animal behavior in the Antarctic over the Winter season.</p> |  <p>Winter in the Antarctic (4:02 min)</p> |
| <p>This student is doing the work of a scientist by investigating organisms present in a bog. (Watch video to 5:23 min)</p> |  <p>Organisms in the bog (3:51 min)</p> |

| The work of scientists | Video link |
|---|---|
| <p>This chef is working like a scientist to investigate the most effective method to make crispy chips.</p> |  <p>Making potato chips (2:47 min)</p> |
| <p>This scientist is analysing blood samples and drawing conclusions from the data gathered.</p> |  <p>Diagnosing diseases (1:27min)</p> |
| <p>This scientist is using computer data to explore what is present in different space systems.</p> |  <p>Gases in space (4:22 min)</p> |

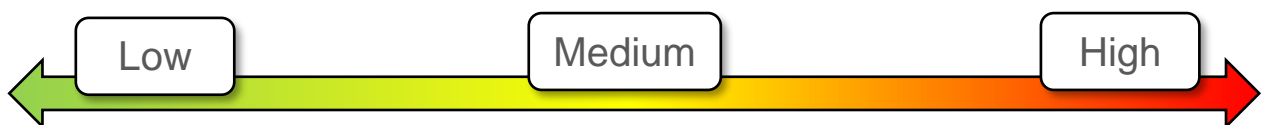
Student Worksheet

Using the examples of “the work of a scientists” discuss the following



Use these questions to discuss your work as a scientist

1. As part of school science, you will act as a scientist. Where are all the possible locations you might be doing the work of a scientist?
2. **A hazard is anything that has the potential to do you harm.** Identify 2 possible hazards of working in one of these locations.
3. **A risk is a measure of how likely a hazard is to do someone harm.** On this scale, rate how likely you think these hazards could cause you or others harm.



4. How could the risk level of these hazards be minimised?
5. Who is responsible for monitoring hazards and associated risks during practical work?

Now summarise your discussion in the following table:

| Location | Hazard | Risk | Precaution to minimize risk |
|----------|--------|------|-----------------------------|
| | | | |

6. In the science laboratory, there can be additional hazards. How are these hazards identified?

7. Some science practical work will require additional safety equipment. List the additional safety equipment the science laboratory provides.

Teacher Reflection



Identifying Hazards and Risks

Student Support Template

Think about places other than the laboratory where you as a scientist could carry out practical work

Identify any hazards and risk level in any alternative place you are carrying out science practical work

Draw your alternative place for science practical work.
Circle all potential hazards you can identify, in this place.

List identified hazards and its risk level

Precautions I will take

Being a Safe Scientist

This bookmark is to support students in developing attitudes and skills of a safe scientist.

Steps for making a bookmark

1. Print out the page below. The template makes two bookmarks.
2. Cut out the bookmark leaving the back and front attached to each other.
3. Fold along the white section between the two halves to create a double-sided bookmark.
4. Glue together or laminate to make durable.



If a class set is made, please follow health and safety guidelines for distribution of materials to pupils.

Being a Safe Scientist

Rules? Responsibility?

I CAN BE A SAFE SCIENTIST BY:

- Following school rules
- Following lab rules
- Obeying signs
- Asking if unsure
- Ensure others do the same

Features of a good risk assessment

- Identifies hazards & risk level
- Manageable
- Clear
- Includes reflection
- Identifies responsibility

Stages of a risk Assessment

- Identify hazards
- Evaluate risk
- Put precautions in place
- Review & Reflect

An tSraith Shóisearach do Mhúinteoirí
 JuniorCYCLE for teachers

Being a safe Scientist

Rules? Responsibility?

Hazards and risks

Hazard
 Anything that has the potential to cause harm

Risk
 A measure of the chance, High, Medium, or Low, that someone will be harmed by the hazard

When doing a practical activity a scientist will consider the following

- WHAT IS INVOLVED?**
 What are the tasks that need to be done to complete this activity?
- WHAT ARE THE HAZARDS?**
 Keeping in mind the tasks, what are the potential hazards?
- WHAT ARE THE RISKS?**
 How likely can the identified hazards do someone harm?
- WHAT PRECAUTIONS WILL YOU TAKE?**
 How will you ensure the risk is low? Or can an alternative task be done instead?

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