

Ethics in STEM Projects

If you are thinking of working with humans or animals, it is important to understand how to do ethical STEM. Before starting any work, check to see what you need to do.

Working with Humans

If you are planning to observe, survey or test anyone – including students, family, friends – or even yourself – here’s what you need to know...

All projects involving human participants must:

- Have an adult supervisor to provide advice on STEM ethics
- Get consent from participants (parents, if under 18). Feel free to use the template [Letter of Information](#) and [Permission Form](#)

Projects involving human participants are either low risk or significant risk:

Low Risk – the risk of harm to participants is not greater or more likely than everyday life. Confirm that your project would be low risk by reviewing Youth Science Canada’s [Participation of Humans in Research – Low Risk](#) policy. Your project would *probably* be low risk if you are planning to do:

- surveys
- exercise experiments
- food and drink experiments
- caffeinated beverage experiments
- absorption through the skin experiments

Significant Risk – any project that isn’t low risk is considered significant risk and must follow stricter rules. You can read more about these types of projects in Youth Science Canada’s [Participation of Humans in Research – Significant Risk](#) policy.

If you are entering your project in a STEM fair, check out the ethics information and forms on [mySTEMspace.ca](#). (Your regional STEM fair may have their own forms.)

Improve your plan!

Ethics vs. Numbers

When developing your idea, think about how many tests or trials you will need to do to get a meaningful result. This will help you determine the necessary number of people or animals.

Imagine you were interested in finding out which colour food bowl dogs prefer. If you only had your family dog and neighbour’s dog to test, could you be confident in your results? Now imagine you wanted to find out which type of music students found more energizing. Rather than surveying an entire school of 1200 students, could you survey a smaller number and use those data to represent everyone?

Talk to your adult supervisor to design testing that is ethical, practical, appropriate, and will give you enough data to be confident in your conclusions.

Working with Animals

If you are planning to observe or test any kind of animal, or use animal/human tissue, here's what you need to know...

All projects involving animals must:

- Have an adult supervisor to provide advice on STEM ethics
- Create a research plan with your supervisor. Feel free to use the template [Use of Animals Research Plan](#)
- Comply with applicable federal legislation (e.g. [Health of Animals Act](#); Criminal Code of Canada [section 446, Cruelty to Animals](#), provincial legislation)

Invertebrates – animals without a backbone (including worms, insects, molluscs, protists)

- Most experiments involving invertebrates (except cephalopods) are allowed; however, there must be clear educational or scientific value, and the animals must be treated with care and respect.
- Confirm your project would be ethical by reviewing Youth Science Canada's [Invertebrates](#) policy.

Vertebrates – animals with backbones (including mammals, birds, reptiles, amphibians and fishes; includes cephalopods and decapod crustaceans)

- Observation of animals in zoological parks, farm animals, and pets is allowed
- Observation of wild animals, except those at risk, is allowed
- Behavioural experiments with positive rewards are allowed, as long as the animal is not placed in a stressful situation
- Experiments that may negatively affect the health, comfort or physical wellbeing of an animal are not allowed
- Projects that require or lead directly to the death of an animal are not allowed
- Confirm your project would be ethical by reviewing Youth Science Canada's [Vertebrates](#) policy

Animal/human tissues – including cells, organs, blood and animal parts

- These may be used *only* if they are: obtained from a biological supply company; a research facility at a laboratory licensed to do animal/human studies; or salvaged from the food industry.
- Confirm your project would be ethical by reviewing Youth Science Canada's [Animal and Human Tissue](#) policy (which is part of the Vertebrates policy)

If you are entering your project in a STEM fair, check out the ethics information and forms on [mySTEMspace.ca](#). (Your regional STEM fair may have their own forms.)



Remember: If your project might harm others/animals, you have doubts about safety, or you are unsure if your project would be allowed: STOP! Do not continue until you've talked with an adult about your project idea and read through Youth Science Canada's safety and ethics information.