



Claim, Evidence, Reasoning



THINK: What do I think is valid?

Step 1

Write a claim after you have completed the investigation. The claim should relate to the Essential Question.

I claim that _____.



THINK: How can I explain it is valid?

Step 2

Gather evidence to support your claim. As you read, watch videos, or use other resources, find information that will help you explain your claim.

I think _____ because _____.



THINK: Why do I think that?

Step 3

Write your reasoning to describe why the claim is valid. Use the evidence to support your claim.

My claim is valid because _____.

advantage

control

criteria

experimental
investigation

hypothesis

limitation

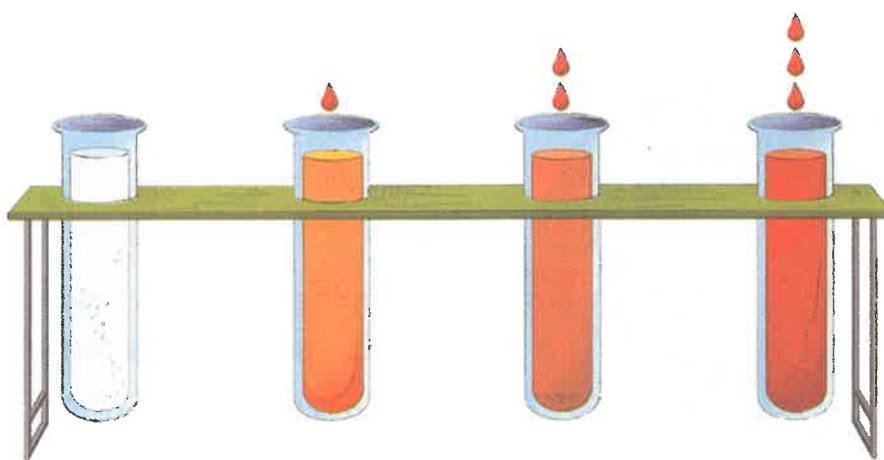
variable

Investigations

Scientists observe the world around them to determine the answers to all sorts of questions. In order to understand a scientific concept, scientists perform experimental investigations. An **experimental investigation** is a fair test in which a control is identified and variables are measured to test a hypothesis. You can carry out experimental investigations in a lab, in the field, or in a classroom.

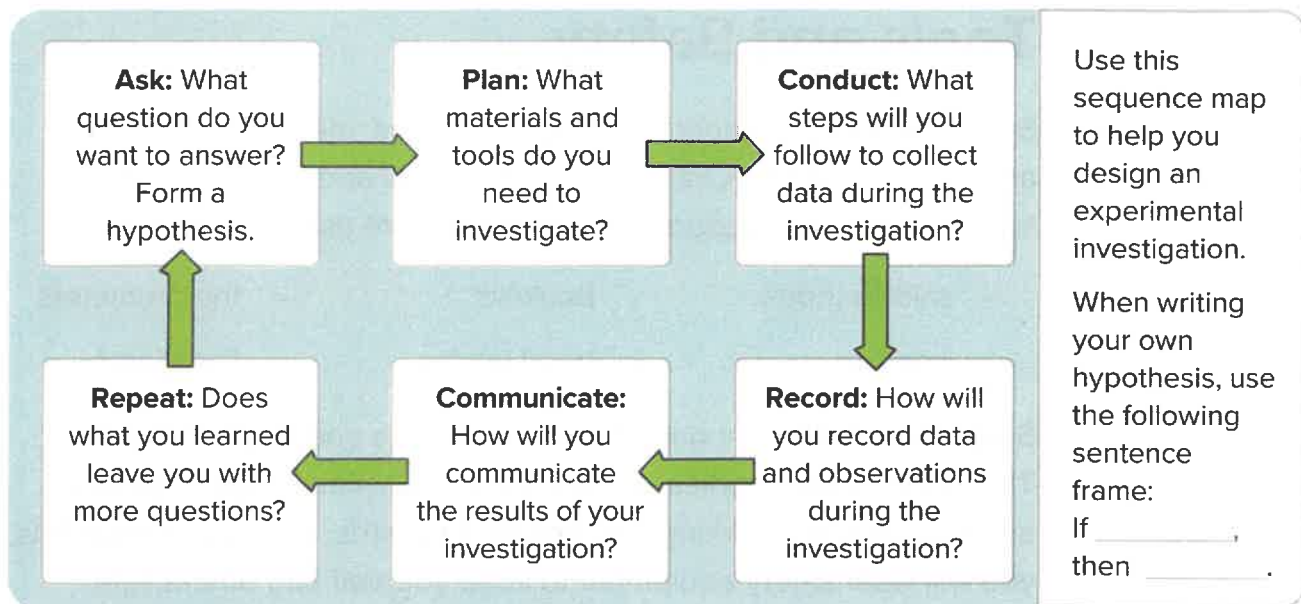
When conducting an experimental investigation, scientists begin with a hypothesis. A **hypothesis** is a prediction that can be tested. Then they make a plan to test their hypothesis. Scientists need to make sure that their test is fair. One way to do that is to make sure there is one variable and one control. A **variable** is a condition in the experiment that can be changed. A **control** is the variable in an experiment that remains unchanged.

In the experiment below, a scientist made a hypothesis that adding more drops of food coloring to water results in a bolder color. The scientist began by filling each of four test tubes with 100 mL of water. The scientist added no food coloring to the first test tube. They added one drop to the second test tube, two drops to the third test tube, and three drops to the last test tube.



The control in this experiment was the water. Each test tube was filled with 100 mL of water.

The variable in this experiment was the amount of food coloring. The amount was different in each test tube.



Descriptive Investigations

Scientists also use scientific practices to complete descriptive investigations. During a descriptive investigation, scientists look at the world around them. They make predictions about what they think will happen, observe the phenomena in action, and draw conclusions from what they observe. At the end of the investigation, scientists check to see if their results supported their prediction and use evidence to explain why or why not.



Look for this symbol in your book and take a break to “Talk About It” with a partner or small group. Collaborating with others is important in science.



Hands-On Investigation

Create a Constellation

SC.5.N.1.1

SC.5.N.1.5



Get your notebook and go explore!

Tools and Safety

Scientists and engineers use tools to observe, measure, test, and analyze information. Check out the list below and determine which tools are used to measure and which tools are used to observe.

- microscopes
- beakers
- thermometers
- scales
- hand lenses
- flashlights

Safety is an important part of every scientist's and engineer's job. They protect their bodies with equipment such as goggles, gloves, and aprons when working with potential hazards. During investigations, you will wear safety equipment to keep yourself and others safe from injury.



How can you demonstrate safe practices during field investigations? Discuss with a partner.



Astronaut Jessica Meir is using a microscope on the International Space Station (ISS). The ISS is a science lab orbiting Earth where astronauts from all over the world go to study different things.

What safety precautions and tools do you see?



What tools are needed for safe space travel?
