# Unit 01 : Warming Experiment (Part 1)

***Video 03:***

Hello.

In this video, we will learn how scientists gather information and how scientists make guesses about the world based on their findings.

We will investigate the different steps involved in an experiment and begin to set up our own warming experiment.

Let's get started by learning about experiments.

**An experiment is a scientific test where you perform a series of actions  and carefully observe what happens in order to learn about something.**

For example, if you want to test to see if water freezes faster than soda, you could conduct an experiment where you put an equal measurement of water  and soda in a freezer and observe which liquid turns to solid faster.

The information or data we collect from this experiment would be called our **findings**.

**We call the information we learn from an experiment a finding** because, in science, you look for information and then you find it.

One very important point: an experiment must be able to be **replicated**. That means someone else must be able to do the same thing you did and in the same way that you did it.

If the experiment is replicated and the other scientists observed the same thing that you observed, then you have found good, strong evidence.

This is how science works.

A scientist or group of scientists does an experiment that produces a finding.

In other words, they find the information they were looking for. Then, another scientist or group of scientists replicate the first experiment. That means they do the same thing in the same way and then observe it to see if the same results happen.

If it does, they have a finding that supports the first experiment.  If the result is different, well, that's a finding too.

It is evidence that they need to look at the question more in order to find the answer.

Let's try an experiment ourselves to see how it works. And when we do the experiment,

you should pay close attention to what we are doing in each step and how we are doing it.

That way, if you want to replicate it at home, you will be able to.

In this experiment, we're going to try to explain why the Earth is getting warmer.

In our experiment, we will observe two jars.  Each jar will represent a different model of the earth's atmosphere.

**An atmosphere, as we remember from an earlier video, is defined as the layer of gases surrounding a planet.** In our course, we are talking about the atmosphere around the planet Earth.

Jar A will represent the Earth's atmosphere in its most basic form.  That means we don't do anything to change what it is.

Jar B will also represent the Earth's atmosphere, but it will be covered at the top with clear plastic wrap and a rubber band.  This change in the jar is called an **independent variable.**

**An independent variable is a thing changed  by scientists to measure differences in an experiment.**

So what's different here?

When the jar is open, the air can flow in and out of the jar. If the jar is covered, nothing can go in or out.

So we want to observe what happens to the temperature of the jar  when the air cannot go in and out of the jar.  And remember, jar A will represent the Earth's atmosphere in its most basic form.  It will be our control in the experiment.

**A control in a scientific experiment is the thing that scientists do not change so they can compare results.**

In this video, we learned how scientists gather information  and how scientists make guesses about the world based on their findings.  We also began to set up our own warming experiment.

In the next video, we will conduct a warming experiment and track our findings.  Download the warming experiment chart after this video  so you are prepared to help track the temperature data in our next video.

**Unit 01: Warming Experiment (Part 2)**

***Video 04:***

Hello.

In the last video, we learned about experiments and how scientists gather findings.

In this video, we will observe an experiment together and track our own data and findings.

In order to track your data, you'll need your Warming Experiment Chart, or a chart that's similar.

In the last video, we set up two different jars that each represented the earth's atmosphere.

Jar A was open with a thermometer inside and Jar B was sealed with clear plastic wrap and a rubber band with a thermometer inside.

As a reminder, Jar A represents the earth's atmosphere in its most basic form. That means we don't do anything to change what it is. It is our control in the experiment.

Do you remember what a control is? That's right.  **A control in a scientific experiment is the thing that scientists do not change,** so they can compare results.

Jar B also represents the earth's atmosphere in this experiment.  But it is covered at the top with clear plastic wrap and a rubber band. This change in the jar is called the **independent variable.**

As you know, **an independent variable is a thing changed by a scientist  to measure differences in an experiment**.

Now that we have both jars set up we are ready to begin the experiment. Our dependent variable or the thing we want to observe or measure is the temperature of the jars.

To track the temperature of the jars there is a thermometer in each jar.Are you ready? Okay, let's get started.

First we need to take the baseline or beginning temperature of both jars.

Both jars are 23 degrees celsius which is room temperature. On your warming experience chart, begin to track your data.

Fill in 0 minutes for the time and 23 degree celsius for the temperature of both jars. Also mark any observations or notes you have. It should look something like this.

Now that we have our first temperature recorded,

let's place both jars in direct sunlight and wait to see what happens.

We will record the temperatures of the jars every five minutes for 30 minutes.

Okay five minutes is up.

Jar A and Jar B temperatures are both still 23 degree celsius.

Track this on your Warming Experiment Chart and take any observations or notes you have.

Ten minutes is up.

Jar A's temperature is still at 23 degrees Celsius and

Jar B's temperature is now at 24 degrees Celsius. Track this on your Warming Experiment Chart.

Halfway point.

15 minutes is up.

After 15 minutes, Jar A's temperature is still 23 degrees Celsius. However, Jar B's temperature is now 25 degrees Celsius.

Why do you think Jar B's temperature is increasing faster than jar A?

Write a few observations or notes in your Warming Experiment Chart.

20 minutes is up.

Jar A, is finally starting to get warmer and it's 24 degrees Celsius.

Jar B, stay the same at 25 degree Celsius.

Track this on your Warming Experiment Chart.

25 minutes is up.

Jar A's temperatures stayed the same at 24 degrees Celsius and

Jar B's temperatures increased a little more to reach 26 degrees Celsius.

Track this on your Warming Experiment Chart.

Okay, 30 minutes is up.

This is the last data we will collect for the experiment.

Jar A's final temperature is 24 degrees Celsius.

And Jar B's final temperature is 27 degrees Celsius.

As you look at your data, remember that Jar A represented the earth's atmosphere in its most basic form.

And Jar B, represented the earth's atmosphere, but was covered at the top with clear plastic wrap and a rubber band.

So let's think about our results.

How did the independent variable of the clear plastic wrap on the top of Jar B change its temperature?

Was it warmer or colder than Jar A?

What do you think this represents?

Think about all of these questions and rate them in the discussion board following this video.