

1. Objective & Introduction

Today's lesson objective is: **Students will be able to define the term *inquiry* and describe its importance to science.**



Every day we ask questions about the people and world around us. Why is the sky blue? What will the weather be like? But did you ever stop to think about why we ask those questions? We ask a question that we want the answer to, and then follow a set of steps to find the answer. Today we are going to talk about scientific inquiry and discuss why it is so important to science.

Take a moment to think about the objective. What strategies will you use to define scientific inquiry? What are some things you might do to start asking questions like a scientist?

Open your digital notebook and describe any strategies you might use in this lesson. Will you make a list? Will you try to explain to someone else how or why we inquire about things? Or maybe you will draw a chart of the paths you could follow to inquire about something and find an answer. Think about the ways that have worked for you to learn new concepts in the past.

2. Theories and Questions

What do you think of when you hear the term *inquiry*? It sounds like a big word, but it just means *question*. So, *scientific inquiry* involves the ways in which scientists question things and find answers to their questions. In other words, a scientist asks questions and then designs an experiment to collect data that will answer his or her questions. It is important for scientists to ask questions. That is how we discover new things or find out how things work. We gain new knowledge by asking questions.

Scientists find questions to ask by observing the natural world. They use their five senses and sometimes rely on tools such as telescopes and microscopes to study objects and organisms. When they have a question that they want answered they use the scientific method to design an experiment that will provide them with the data they need to answer the question. When they have their answer, they can relay their information to the community so everyone can gain from the new knowledge.

We don't always have to do a full experiment to answer a question. Another way of using scientific inquiry is by doing research. A lot of the questions that we have today have been asked by other people in the past and some of them have been answered. That means others have already done the experimenting for us. We just have to know where to look for the answers!

Let's look at some example questions. What type of inquiry would you use to answer the following questions: research or experimentation?

1. Which species of plant was most abundant in the Cretaceous Period?
2. Does hot or cold water boil faster?

For the first question, students at home don't have any way of experimenting on plants of the Cretaceous Period because that was millions of years ago. Instead, they would have to do

research on all the different species of plants that lived during that time and then compare them to find out which species was the most abundant.

For the second question, we could easily perform an experiment by timing how long it takes a pot of cold water and a pot of hot water to boil. Then, we could compare the times and we have our answer.

Now it's time for you to practice on your own.

Decide if the information you need for each of the following questions would best be obtained for students through research or an experiment.

	Research	Experiment
How long were baby T-rex bodies?	<input type="radio"/>	<input type="radio"/>
How fast does a puddle of rain take to dry if it is 86° outside?	<input type="radio"/>	<input type="radio"/>
When does the Perseid meteor shower usually occur?	<input type="radio"/>	<input type="radio"/>
Why do dogs pant?	<input type="radio"/>	<input type="radio"/>
How fast does snow melt on top of Mt. Everest?	<input type="radio"/>	<input type="radio"/>

3. Turning Observations into Questions

So we made an observation...what do we do next? Well, scientific inquiry involves taking those observations and turning them into questions. Scientists use those observations to come up with questions that they want to answer. Let's look at the example of "The sky looks reddish-pink today." After making that observation, a scientist would look at the sky and ask, "Why is it reddish-pink today?" Once he or she has a question to answer, the scientist can design an experiment to try to answer it.

Let's try turning some observations into questions.

First we'll look at the observation: "The train whistle sounds softer when the train is moving farther away." We know this is an observation because we used our senses of hearing and sight. So now let's turn this into a question. We could ask, "What makes the train whistle sound softer when the train is moving away from us?" We could design an experiment based on that question to figure out the answer to our question.

Another example of an observation is noticing that ground meat is red when it is raw but turns brown when it's cooked. How can we turn this into a question? How about "What type of reaction turns meat from red to brown when it's cooked?" Now that's a question that we could design an experiment for!

Now it's your turn to try some on your own.

Match the question to the observation to which it belongs.

In the grocery store, some fruit is packaged in containers while other fruit is not.

The sunburn that I got at the beach was painful.

The beans in my soup absorbed all the broth.

My bike rusted when it was left in the rain.

My music studio has a soundproof room.

What is the relationship between the type of bean and how much liquid it can absorb?

Which type of packaging allows strawberries to stay fresh the longest?

Which material is the most effective at blocking sound waves?

How effective are different sunscreen products at blocking harmful UV radiation from sunlight?

Which metal is the most resistant to corrosion?

4. Using Observations to Answer Questions

We made our observations and then we asked the question that we wanted to answer. This allowed us to design our experiment and get the data that would answer our question. So what do we do with it? By taking that data and analyzing, or looking closely at it, we can start forming an answer to our question.

Let's look at our sky example one more time. We observed that the sky was reddish-pink, we asked why it was reddish-pink, and finally we designed an experiment and found data for why the angle of light makes the sky appear reddish-pink. Once we have our answer, we can ask new questions and begin new experiments to find more answers. Inquiry is a never-ending process.

Let's practice what we learned.

Your parents got a new car. What would be a good observation about the seats inside the car?

How about, "The seats are soft when you sit on them"? We used our sense of touch for this observation.

Now, what question could we ask about this observation? We could ask, "What type of foam makes car seats the softest?" This question would allow us to design an experiment and test the softness of different types of foam.

After the experiment, our data would tell us which type of foam was the softest, and this would answer our question.

Now let's see how you do with some questions on your own.

Classify each action as something you would do during an inquiry, everyday observing, or both.

Science Inquiry	Everyday Questions	Both
<input type="checkbox"/> Doing research and experimentation	<input type="checkbox"/> Using the five senses for observation	<input type="checkbox"/> Measuring data
	<input type="checkbox"/> Acquiring new knowledge	<input type="checkbox"/> Giving a personal opinion

5. Summary

Great job! By using scientific inquiry, you are learning more about the world around you all the time in an organized way. You can use your five senses to make observations that will lead you to analyze and then be able to explain the questions you develop. Look back at the path you formed in your digital notebook. Does it match the path we developed as we talked about inquiry? If not, add the inquiry steps so that you can refer back to it to review later. The more you question and want to know, the more you will discover! If you need to review you can click the Reteach icon. If you are ready for the assessment, you can click on the assessment icon. Good luck!