



DUKE ENERGY SCIENCE NIGHT

I Spy with my Microscope Eye

Big idea

Microscopes help us to see more than we can with our eyes alone.

You will need

WHAT WE GAVE YOU:

- Digital Microscope
- I Spy with my Microscope Eye instruction sheet

STUFF YOU PROVIDE:

- a computer with a USB type interface
- objects to view - For example: paper, fabric, a coin, dollar, leaf, flower, seashell, anything you find interesting!

Set it up

Plug the Digital Microscope into the USB port on the computer and open the Camera (PC) or Photo Booth (Mac) application. The scope can be used when held in your hand or clipped into the stand. If using the stand, it is a good idea to tape it to the table. The buttons on the scope will not work with most computers. You can use the application to take pictures of images, if desired.

Remove the plastic cap from the end of the plastic tip. Take care to ensure objects (including fingers) do not come into contact with the microscope lens. The clear plastic tip is designed to help protect it.

Place the objects to view and the I Spy with my Microscope Eye instruction sheet next to the microscope.

It is important to review the instruction sheet and practice using the microscope so that you feel comfortable assisting participants.

It's showtime!

As families come up, ask them if they have ever seen or used a microscope before. Ask them, "what does a microscope do?" Explain that a microscope is a tool that magnifies things - makes them look bigger - so we can see tiny details that are too small to notice with our naked eyes.

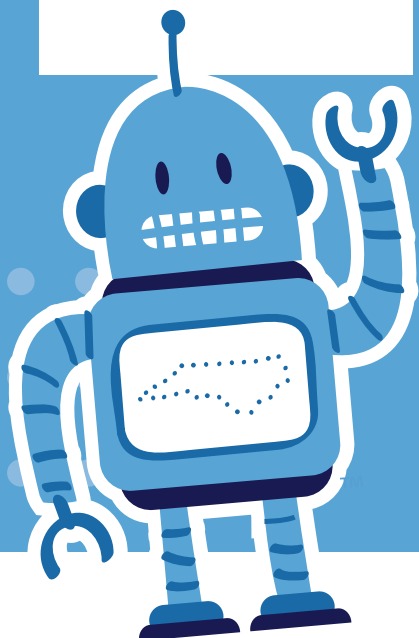
This microscope may look a little different than one they have seen before. This is a digital microscope that connects to a computer, so we look at the magnified image on the computer screen instead of through an eyepiece.

Demonstrate how to use the scope, then let participants try it themselves. In addition to the gathered objects, encourage them to look at their skin, fingerprint, fingernail, hair, and clothing.

Fun options

Print photos of magnified objects to have on the table. Participants can look at them and guess what each object is while they are waiting to use the microscope.

Continued ›



I Spy with my Microscope Eye

Why is this science?

A microscope allows you to look more closely at a specimen and see more than you could with your eyes alone. This microscope works by shining light onto an object. The light is reflected off the surface of the object and captured by the camera lens inside the scope to produce an enlarged digital image. The magnification level is determined by the distance of the object and the focus point set by the big silver focus wheel. This microscope can enlarge the image of a grain of salt (which is only approximately 0.3 millimeters) between 40 to 1000 times it's size, allowing you to see it much better!

With this microscope you are able to zoom in on the outside of objects. Stronger microscopes can magnify even more and be used to get an inside, closer look - making it possible to view cells and even atoms! There are multiple kinds of microscopes that can be used for all sorts of things!

Microscopes help many types of scientists. For example: doctors use microscopes to see bacteria, viruses, and other germs so they can figure out what is making their patient sick; forensic scientists use microscopes to get a closer look at evidence from a crime scene; and engineers use microscopes to help them build the tiny microchips that go inside computers.

North Carolina connection

Speaking of computer chips: Did you know that the Appalachian Mountains are very important to the computer industry? Spruce Pine, NC is the source of the purest natural quartz ever found on Earth! This deposit of quartz (which is a form of silicon dioxide) plays a key role in manufacturing the silicon used to make computer chips. In fact, there's an excellent chance the chip that makes your laptop or cell phone work was made using sand from this area of NC!

North Carolina is home to many companies and universities involved in high tech microelectronics and biotechnology research. The life sciences industry is also prevalent within the state. As a result, many scientists, engineers, and technicians that work throughout NC use microscopy in their work.

To help prepare future scientists, the North Carolina Community College System has a Life Science Training Initiative called BioNetwork. Their website contains a fully interactive virtual 3D microscope! Check it out at: www.ncbionetwork.org/educational-resources/elearning/interactive-elearning-tools/virtual-microscope



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Supplies:

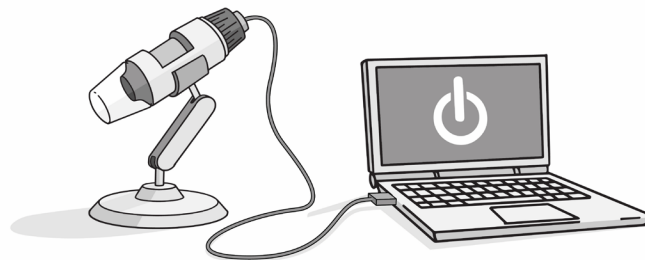
- Digital Microscope interfaced with a computer

Notes:

- The scope can be used when held in your hand or clipped into the stand.
- Make sure the cap has been removed from the plastic tip.
- Take care to ensure objects (including fingers) do not come into contact with the microscope lens.
- The buttons on the scope will not work with most computers.

What to do

1. Hold the microscope right up against an object. The clear plastic tip will help prevent the object from coming directly into contact with the microscope lens. Do not touch the lens.
2. Turn the small wheel on the cord to adjust the brightness of the lights on the scope.
3. You should be able to see an image on the computer screen. You may need to move the scope or the object to ensure it is in the viewing field of the microscope lens.
4. Turn the big silver wheel on the scope until the object comes into focus.
5. To get a clear image, you may also need to move the scope either closer to or farther away from the object.



I Spy Challenges:

What do you see if use the microscope to look at:

- Your skin
- Your fingerprint
- Your fingernail
- Your hair
- Your clothing

