

Think Like a Citizen Scientist Pt. 1

Scientist Observation Cards

Prepare Ahead for As Everyone Arrives: A Scientist Noticed...

Steps:

1. Cut this sheet of paper along the dotted lines to create a set of 5 **Observation** cards.
2. **Optional:** Paste or tape each card onto an index card for strength.
3. In you can't print double sided, rewrite the "Observation" on the back of each card.
4. Create a set of 5 cards for each pair or group of 3-4 girls.

Observation 1: You're researching chimpanzees and notice that they're sticking grass into the holes in termite mounds.

Observation 2: You look through your telescope and notice a strange radio signal. The signal isn't a type that any known manmade or natural source could produce. Later, you see another in a different part of the sky.

Observation 3: You're building a silicon chip that can conduct electricity and be used in a computer or other electronic. While you're working, you drop the chip, which shatters into dust. You notice that the pieces are still sending signals.

Observation 4: You're analyzing data from an observatory to catalog and measure the brightness of stars. Looking at photos taken over time, you notice that the stars brighten and dim at predictable intervals.

Observation 5: After leaving your petri dish of bacteria out, you come back to find mold on your sample. Around the edge of the mold you see lots of dead bacteria.

Scientific Discovery 1: Jane Goodall has observed groups of chimpanzees in Tanzania closely and over a long period of time. She noticed that chimps would use and modify grass and twigs to better reach food. The chimps would dip the grass into termite mounds, attracting loads of termites that might be buried deep and bringing them towards the surface. They also broke the leaves off twigs, adapting them to be a usable tool. Before Jane began researching chimpanzees, the scientific community believed that only humans could build and use tools, but her observations became a new discovery that disproved the past scientific theory.

Scientific Discovery 3: In 2003, a 25 year-old chemistry and biochemistry graduate student, Jamie Bell, was building a silicon chip, and when it broken, she discovered “smartdust,” dust-sized chips of silicon that act like sensors to detect and send biological and chemical information to computers. These tiny microelectromechanical devices help scientists to quickly analyze samples remotely and can be used to do things like monitor water purity, detect harmful chemicals in the environment, and locate tumors in the body.

Scientific Discovery 5: In 1928, Alexander Fleming discovered penicillin after leaving his dish of staphylococcus, a bacteria that can cause infection in humans, out in the laboratory. When he observed the area with dead bacteria more closely, he concluded that the bacteria cells had died because the mold produced a substance that weakened the cell walls and killed the bacteria. This substance would be researched and tested further, eventually becoming penicillin, one of the first antibiotics to treat infections that is still used in medicine today!

Scientific Discovery 2: In 1967, Jocelyn Bell was a postgraduate student studying astronomy. When she noticed the first signal on her radio telescope, she worked with her supervisor to rule out that any humans, satellites, or other manmade objects. But, nothing could explain the signal, so the team wondered if it was from aliens! Once they saw the second signal, they decided that there could not be two groups of aliens trying to contact them, disproving their alien theory. In fact, the signals were coming from a pulsar (pulsating radio star), a highly magnetized neutron star that emits a beam of electromagnetic radiation, and Jocelyn’s observation marked the discovery of a pulsar.

Scientific Discovery 4: In the early 1900s, Henrietta Swan Leavitt worked with a team of female astronomers who had been hired by Harvard College Observatory as “computers” to analyze their data. Assigned with looking at variable stars, Henrietta was able to catalog and identify over 2,400. However, Henrietta wondered what the connect was between the changing brightness of the stars, and used the data provided to her to discover that a line could be drawn between the two stars to determine the relationship between the period and the luminosity of this particular type of variable stars, the Cepheids. This allowed scientists to measure the distance to remote galaxies and expanded the scientific community’s understanding of just how big our universe is.