

# 2016 Women in Science Day Lab Descriptions

## Lab 1: What's in That Dirty Mouth?



**Lab description:** You probably know that the mouths of cats and dogs have lots of bacteria living inside of them. What you may or may not know is that human mouths also contain a wide variety of microorganisms. Are you curious about what kinds of bacteria you can find in your mouth? Come search your own saliva samples for bacteria that live inside the human mouth and discuss some of the positive and negative impacts these microbes have on your life.

## Lab 2: Toss Out Your "Salad"-monella

**Lab description:** Did you know that each year 1 in 6 people will get food poisoning? Food poisoning, or foodborne illness, occurs when people consume food and drinks that have been contaminated with disease causing microbes. The good news is these microbes can be kept under control by properly cooking and handling food. During this lab, students will receive an introduction to microbiology in food and learn about common food borne pathogens. Students will learn about the concept of aseptic technique, awareness of contamination and how to prevent food cross-contamination.



**Websites:** <http://www.cdc.gov/foodsafety/index.html>, <http://www.foodsafety.gov/>,  
<http://www.mars.com/global/brands/chocolate.aspx>

## Lab 3: Who Dunit?



**Lab description:** Who Dunit? That is the question our budding forensic chemists will answer using and viewing analytical techniques used in crime laboratories. The hands-on laboratory will allow students to run two types of chromatography to identify unknown substances and flame tests to differentiate various clear liquids by color changes. The identification of a white powder by infrared (IR) spectroscopy will also be demonstrated.

**Websites:** <http://www.hometrainingtools.com/forensic-science-projects/a/1227/>,  
<http://www.chemguide.co.uk/analysis/chromatography/paper.html#top>

## Lab 4: Why do you Run so Fast?

**Lab description:** In this fun and exhilarating lab the girls can go to different stations to have their flexibility, strength, and balance & coordination measured. They can also have their posture, agility & plyometrics, and running analyzed to improve how they run.

**Websites:** <http://www.apta.org>  
<http://www.bls.gov/ooh/healthcare/physical-therapist-assistants-and-aides.htm>  
<http://www.bls.gov/ooh/healthcare/physical-therapist>



## Lab 5: Mighty Mutualisms: The Nature of Plant Partnerships



**Lab description:** Plants are different from animals in many ways. One of the most significant differences is that plants cannot move around to find resources or mates like animals can. To solve this problem, some plants form partnerships with other organisms that can help the plant get what it needs in order to survive and reproduce. This lab will explore two types of plant partnerships involving insect pollinators and mycorrhizal fungi. Students will work together to design and conduct experiments investigating the effects of these partnerships on living plants.

**Websites:** Mutualism: <http://www.eoearth.org/view/article/154736/>,

Pollination: <http://mbgnet.net/bioplants/pollination.html>,

Mycorrhizal Fungi & Plants: <http://sciweb.nybg.org/science2/hcol/mycorrhizae.asp.html>

## Lab 6: How to Save a Life: The science behind CPR

**Lab description:** You have probably seen CPR performed on TV lots of times, but do you know how it works? What does C.P.R. even stand for anyway???? This lab will reveal the science behind the action of CPR or CardioPulmonary Resuscitation. Students will have a chance to perform life-saving procedures on Simulation Manikins as well as learn how to save a “High Fidelity” Manikin that blinks, breaths, and even talks!

**Websites:** <http://www.heart.org>, <http://www.redcross.org>,

<http://www.discovernursing.com>



## Lab 7: Have a heart (and lungs)



**Lab description:** This lab will focus on normal anatomy of the hearts & lungs of animals. Normal landmarks will be shown, then each participant will have the opportunity to dissect a heart & lung set. If abnormal gross pathology is present it will be discussed. Heart chambers & valves will be seen. Blood flow will be illustrated. Two mixed / large animal veterinarians and an animal technician will guide you. Both veterinarians practiced for over 10 years before changing paths into regulatory medicine.

**Websites:** <https://www.youtube.com/watch?v=9xhxALk9gm8>,

<https://www.youtube.com/watch?v=yE3Y-XR8Ax4>

## Lab 8: Analyze This: Using Maps and Data to understand our World

**Lab description:** Spatial analysis is how we understand our world—mapping where things are, how they relate, what it all means, and what actions to take. In this hands-on GIS computer lab we will create maps, explore the data behind the maps, and learn about how spatial analysis is used to create information that can be used to make decisions and solve problems.



## Lab 9: Volcanoes!



**Lab description:** This lab will delve into all aspects of volcanoes - some of the most feared and awe-inspiring structures in the natural world. The lab will be divided into four stations that will cover everything from how volcanoes are formed to the history and dangers of volcanic eruptions. You will be able to build your own volcanoes and watch them explode, play with edible magmas and lavas, and model the formation of magma deep within the Earth's crust.

## Lab 10: Let's Make Some Weather!

**Lab Description:** In Kansas, we are able to witness a variety of different weather phenomenon all year long! But have you ever wondered how these various weather events actually occur? In this lab, we will conduct 3 mini-experiments in which we will make lightning, fog, and learn why the sky is blue. We will learn about the physical elements in the atmosphere that allow these weather types to develop so that you can have a better understanding of the diverse weather we experience here in Kansas!



## Lab 11: Things Aren't Always As They Seem: Discovering Reality with Psychological Science



**Lab Description:** Picture a psychologist at work. People often imagine a therapist listening carefully to a client as they lay on a couch revealing their deepest secrets, worries and fears. While this image may be correct for some psychologists, there are actually many different types of psychologists who all have a similar goal: to use science to understand why people think, feel, and act the way they do. This lab will introduce you to different "subfields" of psychology by allowing you to be participants in three different experiments, each of which will show you that things aren't always as they might seem. In one experiment, you'll be able to find out how your senses of smell and taste depend on each other for you to enjoy food. In another experiment, you'll have the opportunity to explore how labels shape reality--instead of the other way around. Finally, we learn that memory is not always as straightforward as it seems. You will participate in several different demonstrations to show you how memory works. We will implant false memories, learn why we have a hard time remembering some things, and how to remember more each day.

## Lab 12: Everyday Super Powers!

**Lab description:** We all know that if you touch something hot, you will pull back quickly, or if you start running, your heart beats faster and harder. Have you ever thought about how that happens? Come investigate your amazing "Super Powers" and the mechanisms that allow your body to respond to different circumstances. Then test the speed and strength of some of your own responses, look at some actual organs that allow us to do these amazing things and find out if organisms other than humans have similar super powers.



## Lab 13: We've Got a Bleeder!



**Lab Description:** This lab will give a brief insight into the healthcare field of athletic training and what that medical profession might deal with on any given day. Severe injuries to the body's skin can happen in athletics or everyday life, but do you know how to take care of them?? In this lab you will learn the basics of wound care and get to treat a simulated wound yourself! Come see what the field of athletic training is all about!

**Websites:** <http://www.nata.org/athletic-training>,  
[http://www.abpischools.org.uk/page/modules/skin/index.cfm?coSiteNavigation\\_allTo pic=1](http://www.abpischools.org.uk/page/modules/skin/index.cfm?coSiteNavigation_allTo pic=1)

## Lab 14: Are You Going to Drink That?

**Lab Description:** Dirty water? What do you do? Go ahead and drink it? I wouldn't if I were you. Clean water is something we have at the turn of a faucet handle, but how does it get that way? Learn how water is made potable and learn what it takes to build a water filtration system.



## Lab 15: Secret Codes



**Lab Description:** Coding messages is a very sophisticated mathematical process. We will talk about various examples of codes. You will encode a message for another group and then work on decoding a message you are given. Did you know the largest employer of PHD mathematicians is the National Security Agency?

## Lab 16: Garbology: Are We What We Throw Away?

**Lab description:** Archaeologists spend most of their time analyzing the material culture left behind by people in the past. In other words, we make assumptions about how people lived based on their garbage. What can we learn about our society by studying our own garbage, and how does this knowledge inform us about past cultures? Trash Can Archaeology, also known as "Garbology" is the study of modern trash. This lab will analyze the trash contents from the Washburn community. From the evidence, you will evaluate the behaviors and lifestyle of the person or people behind the garbage. We will also discuss what you throw away and what archaeologists might learn about you and your family if they found your trash a thousand years from now.

**Website:** The University of Washington's Garbology Project:

<http://uwgarbology.weebly.com/>



## Lab 17: What's in the water? Nutrient Runoff Experiment



**Lab Description:** Did you know that pollution from stormwater runoff eventually ends up in our rivers and streams? This pollution affects fish, mussels, and other aquatic organisms! We will demonstrate what happens when we carelessly apply fertilizers to residential lawns and/or agricultural land. We will use simulated stormwater running down real grass, to then measure pollutant concentrations. These concentrations will depend on how much prior to rain, the fertilizers were applied. At the end of this lab you should be able to understand the relationship between fertilizer application and storm water, as well as, learning how to read test strips for Nitrogen and Phosphorous.

**Website:** <http://www.kansasriverscience.org/whats-water/stormwater-runoff/runoff-lesson>