

SCIENCE ADVENTURE LAB

Suggested Activities



Check out these activities to help reinforce scientific and health-related concepts covered on the *Science Adventure Lab* and to learn about health issues and careers in science!

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Catch Your Breath!



Learn about a family member, friend, or famous figure with asthma: Research how family/friends or Olympic/professional athletes with asthma have learned to manage their asthma and exercise at the elite level by utilizing certain techniques (such as warming up longer, hydrating more, taking medicines such as albuterol before activities, and then cooling down longer afterwards). Here is a list of possible people to research:

<https://www.disabled-world.com/disability/awareness/famous/>

Seeking the Sugar Solution



Nutrition analysis: Team Nutrition offers a variety of resources for nutrition education including “The Great Garden Detective Adventure” and “Serving Up MyPlate”: <http://teammnutrition.usda.gov/>

Analyze beverage content: Use the Rethink Your Drink chart: https://www.cdc.gov/nccdphp/dnpa/nutrition/pdf/rethink_your_drink.pdf

Analyze school cafeteria lunches: Investigate the nutritional content of lunches and invite the head of the school or district food service to present to what extent nutrition factors into what foods end up on the school cafeteria menu.

Analyze food labels: Combine at least three healthy drinks to create your own unique “Crazy Concoctions,” which can be compiled into a class recipe book.

CDC’s Body and Mind (BAM) activities (For 4-8th graders): Web games and lessons that teach basic concepts of health, nutrition, and how food, sleep, and physical activity can impact energy levels: <http://www.cdc.gov/bam/>

Where is Your DNA?



Debate on biotechnology applications that utilize DNA extraction: Assign yourselves (family/friends/classmates) into two groups to debate one topic relating to DNA extraction (such as cloning, genetically modified organisms (GMOs) and DNA profiling). For example, “Should [Insert biotech application name, such as cloning] research be expanded, or should funding go toward other types of research?” Groups should choose which side they will advocate for and discuss the pros and cons of each before coming to a consensus.

Balloon model: A dry lab demonstration of the DNA extraction procedure to help visualize what is happening on the molecular level during each step. This visual exercise demonstrates the process of DNA isolation from cheek cells. Create a model of a cell using a clear latex balloon filled with various small items and string to represent membranes, organelles, protein, and DNA. Emphasize that detergent dissolves membranes (breaking open the balloon), protease digests proteins (crushing small items), and salt and ethanol cause the DNA to precipitate and aggregate (gathering of string).

Vital Signs!



Practice taking vital signs at home:

Heart rate (pulse): Locate your pulse by firmly, but gently, pressing your index and middle finger on the artery at your lower neck, inside your elbow, or inside your wrist. Once you have located your pulse, watch the clock and count heart beats for 15 seconds. Multiply this number by 4 to determine heart rate (beats per minute). You could then do a few jumping jacks and immediately repeat the measurement for comparison.

Respiratory rate: Measure by observing the number of times your chest rises and falls in 15 seconds. Multiply this number by 4 to determine respiratory rate.

Measure the heart rate and respiratory rate of a family member or friend and discuss the results.

Sense, Think, Move!



Smell: Create your own Sniff-O-Rama with mystery odors, using items like food or flowers, and see if your friends or family can identify the odors.

Sight: There are many activities to be found online regarding vision and optical illusions. This can be discussed in the context of how the brain receives images. Looking at eye anatomy would also be great here.

Hearing: Similar to vision, there are many activities to be found online regarding hearing and auditory illusions. The McGurk effect is an example of one such illusion that addresses both hearing and vision. Looking at inner ear anatomy is another great activity.

Taste: Discuss the tongue, our taste buds, the connection with our brains, and do a taste test to identify different types of tastes such as salty, sour, etc.

Touch: Discuss how our brains receive information from our skin. You could look at images of the skin to identify the various layers and components such as hair cells and sebaceous glands. With the help of a family member or friend, close your eyes and see if you can identify mystery objects using only your sense of touch. You can also do a two-point touch test where you have two dull, pointed objects such as pencils. Start with them close together when you touch the skin, then move them apart little by little and identify when you are able to recognize that there are two points touching the skin. Record the space between the two points. This is an opportunity to discuss skin sensitivity.

Learn about comparative anatomy: Look at the brains of many other species and talk about their relative sizes and structures when compared to each other and to a human brain.

Think about electricity and messages travelling through our nervous systems: Draw a person with a brain, spinal cord, and nerves inside. Then, trace the paths that electrical signals would take through those parts when the body is doing various movements like flexing an arm or bending a leg. You can also think about electrical signals by using a simple light bulb circuit. Connect and disconnect the circuit to turn the light bulb on and off for a visual representation of electrical signals being received.

Neuroscience for Kids website: Dr. Eric Chudler's website through the University of Washington has an extensive collection of neuroscience related information as well as many activities and games in the 'Experiment' section: <https://faculty.washington.edu/chudler/neurok.html>

Investigate Science Careers



The *Science Adventure Lab* team hopes you will ultimately take on the challenges and rewards of a career in science and healthcare! Here are some online resources to learn more!

National Institutes of Health (NIH) Office of Science Education: LifeWorks – Careers in Science portal: <http://nihlifeworks.org/feature/>

“Becoming a Scientist” videos from the Howard Hughes Medical Institute: <http://www.hhmi.org/becoming/>

EnviroHealth Connections: Meet the experts at the front lines of environmental health problems:

<http://experts.thinkport.org/envirohealth/default.aspx>

