

# Science Expo 2015 Activity Short Descriptions

## INHERITANCE AND ADAPTATION

### 1. Fruit and Veggie DNA

Extract DNA from strawberries and peas using alcohol, salt, and soap, demonstrating that DNA is a real thing you can see/touch!

*Passport Question:* Give an example of one thing that has DNA and one thing that does not have DNA.  
Answer: Has DNA: any living thing (strawberry, human) Doesn't have DNA: any non-living thing (rock, cloud, pencil)

### 2. DNA Recipes

Build a DNA model, following a recipe for various organisms on cards. If you get it right, you get a sticker of that organism! This activity shows the double helix shape of DNA and that the base pairs are a code that determines traits of the organism.

*Passport Question:* All living things have their own unique code called DNA that is located in the cell.

### 3. Crazy Traits

Roll dice to determine if critters will receive trait from mother or father, building a crazy creature along the way. Activity demonstrates inheritance, that traits come from mother and father and are selected by random chance.

*Passport Question:* What trait would you need in order to hear better? Answer: Elephant ears or big ears

### 4. Tree of Life

Tree of Life poster with blank spaces and bin of species for kids to add on to the tree. Station also includes live plants and animals including fish, frogs, bearded dragons, and rabbits, for kids to look at. This activity explains species diversity, tree thinking, and classification of organisms.

*Passport Question:* True or false... All living things are related. Answer: True!

### 5. Natural Selection in Action

Students act as birds "hunting" the moths on trees with peppered moths stuck on by Velcro, starting on the white tree, then moving to next darker tree each round. As tree gets more polluted, white moths are more frequently eaten, simulating natural selection and demonstrating how human actions impact biodiversity.

*Passport Question:* What is the process that caused the moth population to change over time called?  
Answer: Natural Selection

### 6. Brilliant Bird Beaks

Kids are given different "beaks" (tweezers, popsicle sticks, spoons, etc.) and try to collect as much "food" as they can (confetti, beans, pasta, etc.) in 30 seconds. Activity demonstrates adaptations in action and variation/diversity within birds.

*Passport Question:* The shape of a bird's beak is an adaptation to their food source.

### 7. Blubber Glove

Dunk two gloves, one filled with Crisco and one without, into ice cold water. Kids notice the hand in the "blubber" glove doesn't feel the cold! Activity explains blubber and other cold weather animal adaptations.

*Passport Question:* What helps animals in arctic waters stay warm and keep afloat? Answer: Blubber!

### **8. Flower Engineers**

Choose your favorite pollinator, then use the chart to create a flower that would attract it with colored tissue paper and other materials. Activity shows how features of flowers are adaptations that help them attract pollinators.

*Passport Question:* The colors and shapes of flowers are adaptations that help them to attract pollinators.

### **9. Seeds on the Move**

Students will choose a seed then test the seeds with water, fans, etc. to figure out how this seed disperses (floats on water, attracts animal, catch a ride on an animal, by wind) and sort into dispersal strategies.

*Passport Question:* What is one way a seed can travel? Answers: wind, water, on animals, in animals

### **10. Awesome Owls**

Tahoe Institute for Natural Sciences (TINS) provides stuffed owls and wings and a lesson on owl's amazing adaptations.

*Passport Question:* Name one adaptation owls use to capture prey.

Answers vary: silent flight, sharp talons, large eyes with high level depth perception, flexible neck

## ORGANISMS AND ECOSYSTEMS

### 11. Magical Microbes

This activity introduces bacteria and archaea as some of the most ancient, diverse, and numerous organisms on Earth, showing examples of microbes in our world in soil samples and petri dishes. Kids are able to swab their own petri dish to grow bacteria at home.

*Passport Question:* A microbe is a tiny, microscopic organism found in water, soil, and in us!

### 12. Gone Fishin' in Lake Tahoe

Students learn about the Tahoe food web and roles of fish, then go "fishing" in the lake (kiddy pool), identifying the fish they catch and describing them as native or non-native.

*Passport Question:* What was the original large trout species in Lake Tahoe? Answer: Lahontan Cutthroat Trout What species has replaced it? Answer: Mackinaw / lake trout

### 13. Tahoe Plankton!

*Description:* Students will get to learn about the Lake Tahoe food web as they look at some local phytoplankton (producers) and zooplankton (consumers) under a microscope.

*Passport Question:* When it is acting as a consumer, Zooplankton eats \_\_\_\_\_. (Answer: phytoplankton)

### 15. On the Ground and Beneath the Surface

*Description:* Using live organisms, students will be able to observe both an aquatic and terrestrial ecosystem in action and learn the significance of each species in those particular food chains. There will be 2 aquariums each containing a producer, consumer, and decomposer for them to observe.

*Passport Question:* Producers, consumers and decomposers are all important parts of a \_\_\_\_\_ chain. (Answer: food)

### 16. Bioramas

*Description:* Students will have the chance to sort plastic animal figurines into their appropriate biome dioramas and learn about why each animal is in each particular habitat as well as where these biomes are located on earth.

*Passport Question:* True or False: Organisms can survive only in environments in which their particular needs are met. (Answer: True)

### 17. Food Chain Aim

*Description:* Students learn about food chains, producers, consumers, and decomposers as they unscramble and sort stuffed animals of different species into their appropriate classifications of producers, consumers, or decomposers. Students will toss the stuffed animals into labeled bins to sort them (bean bag toss style).

*Passport Question:* \_\_\_\_\_ act as nutrient recyclers in the ecosystem by breaking down dead and decaying organisms, \_\_\_\_\_ create their own food from energy from the sun (through photosynthesis), and \_\_\_\_\_ get their energy by eating other organisms. (Answer: Decomposers, producers, consumers)

### 18. In Search of Pollen

*Description:* Students will dissect flower blossoms to learn about the inner workings of flowering plants and what role pollen plays in the reproduction of plants.

*Passport Question:* Pollination involves the transfer of a flower's \_\_\_\_\_ to another flower's \_\_\_\_\_ by a \_\_\_\_\_. (Answer: pollen, stigma, pollinator)

### **19. Let's Play with Food (Chains)!**

*Description:* This will be a station where kids get to play an online game to learn about food chains as well as have the chance to do some arts and crafts as they color and construct food chain cootie catchers.

*Passport Question:* All food chains have producers, consumers, and decomposers. Give an example of one of the food chains you saw in the game. (Answers: 1. flower, caterpillar, bird 2. acorn, mouse, snake, hawk 3. algae, small fish, big fish, dolphin 4. flower, insect, small fish, big fish, seagull 5. plant, grasshopper, lizard, eagle, mushrooms 6. plankton, fish, jellyfish, turtle, shark, bacteria 7. plankton, mussel, small fish, big fish, human.)

### **20. Planting Party**

*Description:* Students will have the chance to plant and take home their own seed to watch it grow. Students will learn about photosynthesis.

*Passport Question:* Which four things do plants need to grow? (Answer: Air, water, sunlight, soil)

### **21. Pumpkins and Butterflies and Frogs, Oh My!**

*Description:* Through a traditional card game, students will learn about various life cycles and notice the similarities between each even though the species are so different.

*Passport Question:* True or False: Most animals and plants go through similar stages during their life cycles. (Answer: True)

## HEALTH AND NUTRITION

### 22. Train Your Brain

This activity challenges participants ability to ignore their first instinct and read the word on the card they are shown. Instead they have to say the color that each word is written in- the Stroop Test. Participants can be timed on how long it takes them to get through each stack of cards, and can also test between color cards, random words, and Spanish colors.

*Passport question:* True or False... Every time you learn something new, you change the structure of your brain. Answer: True

### 23. Think Fast!

Students will learn the difference between reflexes and reaction times, which is voluntary and which is involuntary. To test your reaction time, you catch a ruler/ yard stick that is dropped between your fingers, then sort a deck of cards to understand the path of information from your eyes to your fingers. Reflex tests include light pens for pupil changes, and percussion hammers for knee test.

*Passport question:* \_\_\_\_\_ are a voluntary or something you can control. \_\_\_\_\_ are involuntary, and happen unintentionally. Answer: Reactions, Reflexes

### 24. Confusing the Senses

Students will do 4 sense tests to see how perception affects how they experience their senses. Tests include optical illusion, 2 point discriminators, taste and smell tests.

*Passport Question:* Illusions trick your \_\_\_\_\_, changing how you perceive and experience your senses of touch, taste, hearing, smell and sight. Answer: Brain

### 25. Optical Art

Make your own optical Illusion of a 3-D hand

### 26. Brain Waves (facilitated by Keith Tatsukawa from Tahoe Institute on Rural Health Research)

Station involves measuring brain waves and the importance of concussion awareness.

*Passport question:* You get a concussion when your soft brain whacks against the inside of your \_\_\_\_\_. Name one symptom of a concussion \_\_\_\_\_. What is the best way to prevent a concussion when you do potentially dangerous activities \_\_\_\_\_.

### 27. Name That Organ

Learn the location and function of organs with this game. Facilitator will quiz students on the function of organs, and their location. The students will have to find the right organ and put them in the correct location on an organ vest they will be wearing,

*Passport question:* Name one organ and the role it plays in your body.

### 28. A Close up of You

A self-explore station where students can look through the microscope at different slides of human tissue and compare what they see. Slides will be blood, bone, skin, hair, muscle and cheek cells.

*Passport Question:* Name some different types of tissue found in the human body.

### 29. Play to your Strength

Model of bone and muscle interactions. Five pounds of fat and five pounds of muscle shown on scales side by side so children can visualize and understand the size difference between the two parts of our body. Students will learn the 3 types of muscle tissue - smooth, skeletal and cardiac - and participate in two timed fitness test, planks and wall sits. They will learn the benefits of exercising.

*Passport question & answer:* Give two reasons why it's important to exercise

1. \_\_\_\_\_
2. \_\_\_\_\_. It strengthens muscle, strengthens joints, strengthens bones, prevents injury, prolongs endurance.

### **30. A Bone of your Own**

Students will learn about the skeletal system through the giant skeleton and x-ray pictures. They will then learn what posture is, and how it affects balance. They will then go through a series of balance tests.

*Passport Question:* Your balance is based on posture and the movement of your \_\_\_\_\_.

### **32. Don't Hold Your Breath**

Students will explore lung capacity, how lungs function, and the effects of smoking.

*Passport Question:* Your lungs transport \_\_\_\_\_ from the air into your lungs, and the \_\_\_\_\_ from your lungs into the air.

### **33. Your Amazing Heart**

Students will learn how to measure their pulse using their fingers, but counting for 15 seconds then multiplying by four. They will do the same thing after doing 30 jumping jacks to learn the difference between their resting heart rate and elevated heart rate. They will compare their results to a finger oximeter, stethoscope, and explore the values of their heart.

*Passport Question:* Your heart is a muscle that pumps \_\_\_\_\_ and circulates it around your body.

### **34. Germy Transfer**

Students will learn the importance of washing their hands by using glow powder to simulate germs, how germs spread, and the effects of handwashing on germs.

*Passport Question:* Germs are tiny living organisms that spread disease and make you sick. Name one or more ways you can prevent the spread of germs.

### **35. Re-Think Your Drink**

Students learn the amount of sugar found in everyday bottled drink. They get to play a matching game to decide where they think the most sugar belongs, and learn the effect it has on their health. They can then explore foods and the amount of sugar in them, and learn how excessive sugar affects their health.

*Passport Question:* If you are between the ages of 9 - 19, you should be getting no more than \_\_\_\_\_ teaspoons of added sugar a day.