

## Science Expo 2018 Activity Short Descriptions

### ORGANISMS AND ECOSYSTEMS

#### 1. Food Chain Aim

Students learn about food chains and the difference between producers, consumers, and decomposers. They will unscramble and sort stuffed animals of different species into their appropriate classifications by tossing the stuffed animals into the appropriate labeled bin (bean bag toss style).

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

**Answer:** Producers, consumers, decomposers,

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

Using live organisms, students will observe both an aquatic and terrestrial ecosystem in action and learn the significance of each species in those particular food chains. There will be two aquariums each containing a producer, consumer, and decomposer.

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

**Answer:** Food

#### 3. Tahoe Plankton!

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

**Passport Question:** Zooplankton play an important role in Tahoe's food web. They eat \_\_\_\_\_ and are eaten by \_\_\_\_\_.

**Answer:** Algae/phytoplankton, fish

#### 4. Gone Fishin' in Lake Tahoe

Students will 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**Passport Question:** The original trout species in Lake Tahoe was \_\_\_\_\_, but it has been replaced by \_\_\_\_\_.

**Answer:** Lahontan Cutthroat Trout, Lake Trout/Mackinaw

#### 5. Pumpkins and Butterflies and Frogs, Oh My!

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: Many animals and plants go through similar stages during their life cycles.

**Answer:** True

## 6. Bioramas

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

**Passport Question:** True or False: Organisms have specific physical and behavioral adaptations that allow them to survive in particular biomes.

**Answer:** True

## 7. 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. Students will get the chance to inspect microbial colonies growing on petri dishes and underneath a microscope.

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

**Answer:** Microbe

## 8. Living Together

Students will learn that organisms living together have various relationships, some of which may benefit both organisms, benefit one organism while the other is unharmed, or benefit one organism while the other is harmed. They will be given a set of cards that have various organisms from the Tahoe Basin on them. Each card contains a description that explains the organism's needs or the resources it has to offer. Based on the descriptions, students will pair the cards to indicate a relationship between the organisms.

**Passport Question:** Parasitism, commensalism, and mutualism are all examples of a \_\_\_\_\_ relationship between two or more organisms that live closely together.

**Answer:** Symbiosis or Symbiotic

## 9. In Search of Pollen

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 is the process by which \_\_\_\_\_ is transferred to the female reproductive organs of a plant, thereby enabling fertilization.

**Answer:** Pollen

## 10. Planting Party

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:** Sunlight, water, Carbon Dioxide (CO<sub>2</sub> or air), soil

## INHERITANCE AND ADAPTATION

### 11. Flower Engineers

Choose your favorite pollinator and 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:** True or False: The color and shape of different flowers are adaptations that help the plant to attract pollinators.

**Answer:** True

### 12. 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 vary:** Wind, water, on animals, in animals

### 13. Natural Selection in Action

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

**Passport Question:** What process caused the moth population to change over time?

**Answer:** Natural selection

### 14. Brilliant Bird Beaks

Students 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 \_\_\_\_\_ for gathering specific food.

**Answer:** Adaptation

### 15. Blubber Glove

Dunk two gloves, one filled with Crisco and one without, into ice cold water. Students notice the hand in the “blubber” glove does not feel the cold! Activity explains blubber and other cold weather animal adaptations.

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

**Answer:** Blubber

### 16. When Do I Rise?

Tahoe Institute for Natural Science (TINS) staff will be discussing the difference between the three categories of animals active time and circadian rhythms, plus the important reasons why animals rise at different times of day. Then they will play a game where the students are shown a local animal and make their best (educated) guess as to whether they are nocturnal, diurnal, or crepuscular by shooting a ping-pong ball in the right basket.

**Passport Question:** Name one animal that is nocturnal, one that is diurnal, and one that is crepuscular.

**Answers vary:** Examples of nocturnal: owls, bats, mice, Northern Flying squirrel, most moths, raccoons, Carabid beetles, porcupines

Examples of diurnal: Most butterflies, humans, squirrels, hawks, bees, Western tanagers, Mountain chickadees, American pikas, woodpeckers, Western Fence lizard

Examples of crepuscular: rabbits/hares, Mule deer, Nightjars, skunks, Mountain lion, Bobcat, Black bears

### 17. Tree of Life

Tree of Life poster with blank spaces and species cards for students to add on to the tree. Station also includes live plants and animals for students 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

### 18. DNA Recipes

Build a DNA model using a recipe card for various organisms. 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 \_\_\_\_\_ that is located inside their \_\_\_\_\_ .

**Answer:** DNA; cells

### 19. Fruit and Veggie DNA

Extract DNA from strawberries, peas, or cheek cells using alcohol, salt, and soap. This activity demonstrates that DNA is a real thing you can see/touch!

**Passport Question:** Name an example of one thing that has DNA and one thing that does not have DNA.

**Answer:** All living organisms (humans, strawberries, peas, etc.) have DNA. Non-living things (desks, rocks, etc.) do not have DNA.

## 20. Crazy Traits

A roll of the dice determines if critters will receive a trait from mother or father. Students will build a crazy creature based on traits determined by the resulting dice roll. This activity demonstrates that traits come from mother and father and are selected by random chance (inheritance).

**Passport Question:** Different organisms vary in how they look and function because they have different inherited information from their \_\_\_\_\_. These \_\_\_\_\_ are based on chance.

**Answer:** Parents; traits

## HEALTH AND NUTRITION

### 21. 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. 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

### 22. Think Fast!

Students will learn the difference between reflexes and reaction times, which is voluntary and which is involuntary. To test your reaction time first by catching a ruler/ yard stick that is dropped between your fingers and 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

### 23. Confusing the Senses

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

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

**Answer:** Brain

#### **24. 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.

**Answer vary:** Heart circulates blood, Lungs circulate Oxygen, Liver filters blood, etc.

#### **25. 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.

**Answer:** Oxygen; Carbon Dioxide (CO<sub>2</sub>)

#### **26. 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, muscle, and cheek cells.

**Passport Question:** \_\_\_\_\_ performs special functions in the body and is made up of \_\_\_\_\_.

**Answer:** Tissue; cells

#### **27. A Bone of Your Own**

Students will learn about the skeletal system through the model 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 \_\_\_\_\_ is based on posture and the movement of your \_\_\_\_\_.

**Answer:** Balance, skeleton

#### **28. Brain Waves**

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:

**Answer:** Skull; Dizziness/headache/confusion/loss of consciousness

**Passport question:** What is the best way to prevent a concussion when you do potentially dangerous activities \_\_\_\_\_?

**Answer:** Wear a helmet

### **29. 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:** Students should be getting no more than \_\_\_\_\_ teaspoons of added sugar a day.

**Answer:** 5-8 teaspoons

### **30. Germy Transfer**

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

**Passport Question:** Name one or more ways you can prevent the spread of germs.

**Answer vary:** Washing hands, don't touch T-zone or ears, cover sneezes/coughs with elbow

### **31. Play to Your Strength**

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. 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:** Give two reasons why it's important to exercise.

**Answer:** Strengthens muscle, strengthens bones, improves endurance, boosts happiness, prevents disease

### **32. Your Amazing Heart**

Students will learn how to measure their pulse using their fingers, counting for 15 seconds, and then multiplying by four. They will repeat this process 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.

**Answer:** Blood