

Science Expo 2023 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: Name one fish found in Lake Tahoe. Is it native or non-native?

Answer: Answers will vary; example: Lake Trout/Mackinaw, non-native

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. Meet the Microbes

This activity introduces students to the four main classes of microbes (fungi, bacteria, protists, and viruses), the various functions microbes play in our lives, and how microbes vary vastly in size. Students will play a card sorting game to categorize different types of microbes while learning their functions. Using a simple model, students will then compare the size of various microbes.

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: Name two organisms that have a symbiotic relationship.

Answer: Answers will vary; example: Dwarf Mistletoe and Lodgepole Pine

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 (CO₂ or air), soil/nutrients

INHERITANCE AND ADAPTATION

11. Pollination Adaptations

This activity will teach students about the adaptations flowers have that attract pollinators and help them reproduce. Students will match specific pollinator cards with specific flower cards. Each flower attracts a certain type of pollinator.

Passport Question: True or False: The color, shape, and smell 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. 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

17. 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

18. 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.

19. The Adaptation Game

A little imagination goes a long way! This activity involves coming up with adaptations animals would need to evolve if they were placed in a new environment. Students will choose an animal card and an environment card at random and try to draw what that animal might look like if it had evolved in that environment.

Passport Question: _____ are certain traits living things evolve which make it easier for them to survive in their _____.

Answer: Adaptations; environment

HEALTH AND NUTRITION

20. 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

21. 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

22. 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

23. Neuro Futures Championship

This activity initiates conversation between students about near-future, future, and scientific fiction neurotechnology. Coming or fictional technologies are moved through a championship bracket as students discuss the pros, cons, price, and benefits the technology has on society.

Passport Question: What technology did your group decide benefits society the most?

Answer varies.

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 varies: Heart circulates blood, Lungs circulate Oxygen, Liver filters blood, etc.

25. 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: Tissues perform special functions in the body and are made up of _____.

Answer: cells

26. 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

27. Re-Think Your Drink

Students learn the amount of sugar found in everyday bottled drink. They get to play a matching game to decide which drink has the most sugar 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: 3-5 teaspoons

28. 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 varies: Washing hands, don't touch T-zone or ears, cover sneezes/coughs with elbow.

29. Play to Your Strength

Students will learn the 3 types of muscle tissue - smooth, skeletal, and cardiac - and participate in two timed fitness tests: planks and wall sit. They will learn the benefits of exercising and the impacts it has on the entire body.

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

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

30. 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