Sean Kenney's

ANIMAL SUPER POWERS

Made with LEGO® bricks

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Educator Guide

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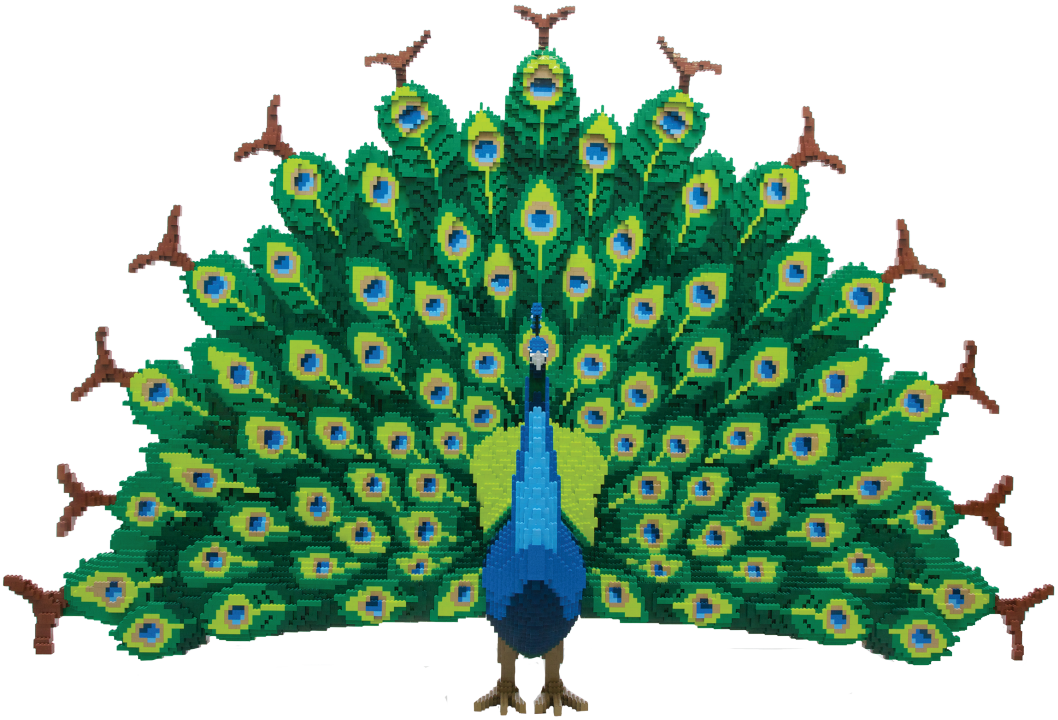

Introduction to the Exhibition

Animal Super Powers!® invites students on a journey that shows the ways animals have adapted to survive and thrive in the natural world. The exhibition displays the work of acclaimed artist Sean Kenney—known for his incredible ability to create striking and expressive works of art using simple LEGO® bricks. Sean Kenney is an award-winning artist from New York City who has been designing and creating art with LEGO® bricks for over 15 years. **Animal Super Powers!®** showcases Sean's amazing ability to use his artistic and engineering knowledge to create incredible works of art that depict our natural world. The 22 larger-than-life sculptures in **Animal Super Powers!®** are a playful spin on traditional sculptural art—making it accessible to students. Much of Sean's work illustrates his personal interpretations of the natural world and humankind's connection with nature. This exhibition will inspire students by immersing them in the world of Sean's amazing animal sculptures.

About this Guide

The guide is composed of ten activities that embody the ideals of STEAM and are aligned with the Next Generation Science Standards. These lessons and activities bridge the learning from the exhibition to the classroom.

Activities

There are five 3rd to 5th grade and five middle school activities that highlight the themes from the main exhibits in the exhibition. The activities cover a variety of performance expectations so teachers can choose which activities are best aligned with their curriculum and which best fit their students' needs and interests. The lessons are follow-up activities designed to be completed after visiting the exhibition to enhance and expand students' experience with the **Animal Super Powers!® Exhibition**.

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Super Eaters

Activity: Eating in the Ecosystem – Students play a game that demonstrates how energy is "lost" as it moves through the trophic levels of a food chain. Students play the roles of plants, herbivores, and carnivores and compete over a finite amount of available food.

Grade Level: 5th Grade

NGSS Standard: 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Materials:

- ✔ A couple of large bags of popcorn
- ✔ Small, medium, and large cups (one for each student)

Description

1. Ask students to reflect on what they noticed in the **Animal Super Powers!® Exhibition**. What were their main takeaways? What did they learn about the eating habits of various animals?

2. Talk to students about ecosystems. First, define what an ecosystem is and discuss how all the parts of an ecosystem interact.

3. Ask students if they know what a food chain is, and give a simple example using a producer, a primary consumer, and a secondary consumer. Use clover, a rabbit, and a fox as an example. Take the students backwards through the food chain by discussing where the fox gets its energy (from the rabbit), where the rabbit gets its energy (from the clover), and where the clover gets its energy (from the sun through photosynthesis). Ask what happens if one of the species in the food chain gets more or less populous (it affects all the other species in the food chain).

4. Take the students to a large play area (court, field, gymnasium) and tell them they are going to participate in a game to demonstrate how energy is lost as it moves through a food chain.

5. Place the small cups randomly around the area, and fill them halfway with popcorn. There should be one cup for every other student. Tell students that the small cups represent clover and the popcorn inside represents the energy the clover made to produce food. Tell students that plants are only able to use about 3% of the solar energy they receive to make food.

6. Give half the class the medium cups, and tell them they are going to pretend to be the primary consumers, rabbits. To survive they need to take energy (popcorn) from the producers and fill up their cups. Pass out the large cups to the other half of the class and tell them they are going to be the secondary consumers, foxes. To survive they need to fill up their cups with energy from the primary consumers. Ask students why the foxes need larger cups than the rabbits (they need more energy or food to survive).

7. Tell students that the game will be played by giving the rabbits 30 seconds to try to collect as much energy as they can from the clover and then the foxes will be released for one minute. The foxes will try to get their energy from the rabbits by tagging them. The rabbits will continue to try to get energy from the clover while also trying to avoid the foxes. If a rabbit gets tagged by a fox, the rabbit must pour all its popcorn into the fox's cup.

8. Ask students to predict what they think is going to happen when the game begins.

9. Begin round one of the game, and after 90 seconds, tell the students to all freeze. Students who do not have cups that are at least half full are eliminated. Count and record how many primary and secondary consumers are left. Refill the small cups and play one more round, and tally the results again.

10. As a class, debrief the results. What happened? Where did the energy end up? Ask them if they spilled any of the popcorn when they ran. If so, this represents energy lost to heat and other activities in an animal's life. Tell students to notice that there need to be more producers than primary consumers and more primary consumers than secondary consumers because of the amount of energy they require to survive.

11. Ask students to play the game again, but as a class they should decide on how many producers and consumers to start with to try to make the ecosystem more sustainable. Play the game a second time and discuss the results. Ask students to think about how this might apply to their local environment. Ask what happens when one part of the food chain is depleted. How does that affect the other parts? What are some ways we can mitigate these effects?

Super Eaters

Activity: The Perfect Tooth – Students investigate how and why various animals have different shaped teeth and then design a tooth that is multifunctional.

Grade Level: Middle School

NGSS Standard: MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Materials:

- ✔ Fruit or vegetables such as carrots, apples, or celery
- ✔ Popcorn or pretzels
- ✔ Dried fruit, jerky, or bread

Description

1. Talk to students about what they noticed in the Super Eaters exhibit of the **Animal Super Powers!® Exhibition**. What did they notice about the various animals? What was similar and what was different?
2. Talk to students about how they eat. Ask them if they eat different foods in different ways and if so how and why?
3. Put students in pairs and have them look in each other's teeth. Ask students to describe how some teeth are different than others. Have students describe the different shape and location of the different types of teeth.
4. Students should notice three distinct types of teeth. The front teeth are called the incisors. Next to them are the pointy canines, and in the back are the molars.

5. Pass out the three types of food to the students and have them predict which teeth they will use to eat each item. Have students eat each type of food one at a time paying attention to which teeth they use to chew it. Have groups share their results.

6. Ask students to describe the different functions for the different types of teeth. The incisors are used to bite into and pierce fruits and vegetables. The canines are used to tear and rip into meat or other tough foods and the molars are used to grind food.

7. Ask students to predict what kinds of teeth various animals have. Ask them what kinds of teeth dogs, pandas, rabbits, or other animals from the exhibition have. Have students look up those animal's teeth.

8. Ask students to draw conclusions about the relationship between an animal's diet and their teeth shape. In general, carnivores have more and larger canines, herbivores have incisors and large molars and omnivores have all three.

9. Put students into groups and have each group record their favorite five foods. Tell each group that they need to design just one type of tooth that will allow them to be able to eat all of their favorite foods.

10. Give students 20 minutes to brainstorm and design their teeth. Groups should draw their teeth and label how they will work. Have each group present their design to the class.

11. Wrap up the activity by discussing how animals have evolved teeth to be best shaped for their diets and talk about how this is an excellent example of how in nature form follows function.

Escape Artists

Activity: Runaway Prey! – Students play a game to observe how the population of predators and prey needs to stay in balance.

Grade Level: 3rd

NGSS Standard: 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Materials:

- ✔ Graph Paper

Description

1. When visiting the Escape Artist exhibit in the **Animal Super Powers!® Exhibition**, ask students to pay special attention to each ecosystem that is on display. Tell students to try not just to focus on one animal but on everything in the exhibit and to think about how they are all connected.
2. Ask students what an ecosystem is and what it means to have a balanced ecosystem. Have students read through the exhibition for information about ecosystems.
3. After the class returns to school, ask students to share what they know about ecosystems and balanced ecosystems. Write responses on the board.
4. Ask students what the terms predator and prey mean and ask for some examples. Ask students how or if the population of these animals are connected.

5. Tell students they are going to simulate what it's like for animals to survive in the wild.

6. Take the students to a large play area (court, field, gymnasium). Count students off from 1 to 4. Separate the ones from the twos, threes, and fours. Have students line up so the ones are facing the twos, threes, and fours about 20 yards apart. Tell the ones that they are the predators—wolves—and the twos, threes, and fours are the prey—deer.

7. On a large poster, record the number of prey and predators.

8. Tell students that the goal of the game is for the deer to run to the side where the wolves are without getting tagged. The goal for the wolves is to tag as many deer as they can.

9. Tell students to be careful as they run then let the deer try to run to the other side while the wolves try to tag them.

10. If a deer is tagged, it means it has been eaten. The student who was tagged becomes a wolf for the next round. If a wolf does not tag a deer, it dies and becomes a deer in the next round.

11. Repeat this process for five or six rounds, being sure to record the population of the deer and wolves on the poster each round.

12. Go back to the classroom and have students graph the data.

13. Discuss the trends and ask students why the populations of both deer and wolves were always going up and down. Note that if the deer population got too high then more wolves would survive and bring the deer population back down. Talk to students about how this is an example of a balanced ecosystem where one species needs to stay in balance with another for its own survival.

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Escape Artists

Activity: Delicate Environment – Students compare and contrast a food web to a food chain to see the need for a diversity of plants and animals for a balanced ecosystem.

Grade Level: Middle School

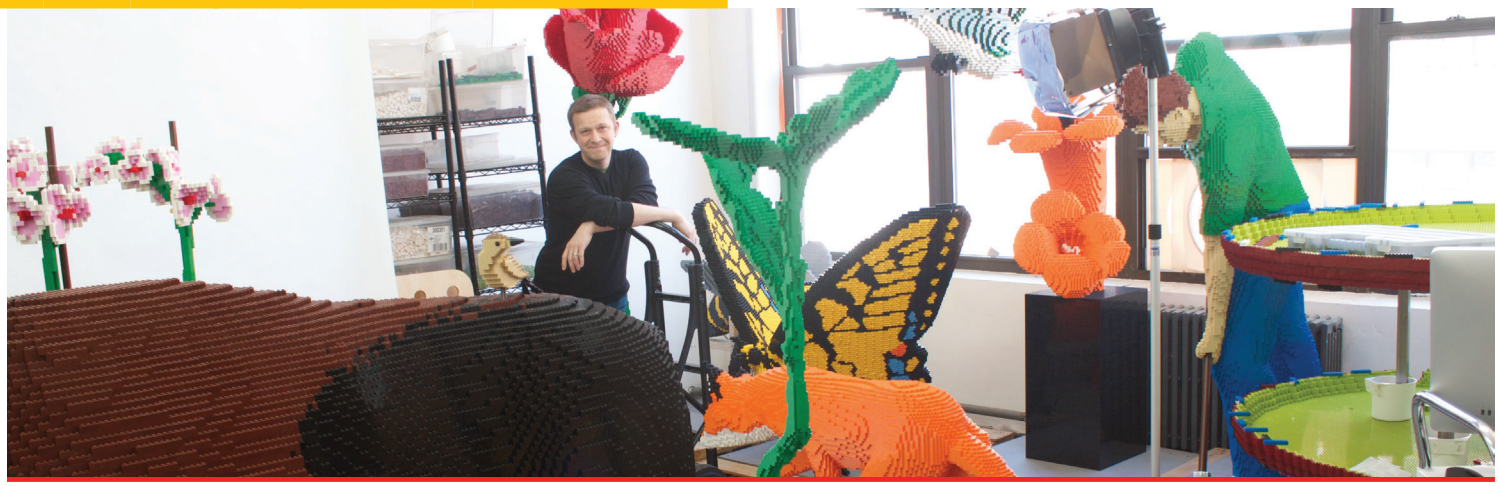
NGSS Standard: MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

Materials:

- ✔ Yarn
- ✔ Computer access (optional)

Description

1. Before visiting the **Animal Super Powers!® Exhibition**, ask students to define an ecosystem, a balanced ecosystem, a food web, and a food chain. Write and save responses.
2. While visiting the exhibition, ask students to think about their definition of a balanced ecosystem and see if there are any clues in the exhibition that confirm or enhance their understanding of the term.
3. When you've returned to your class, have students share their new ideas.



4. Ask students what a food chain is, and ask for an example with three plants and animals in it. As an example, use the food chain of grass, rabbit, and a fox, but feel free to use any food chain that you think your students will understand. Remind students that in a food chain, the energy flows from one organism to another. Have three students volunteer to be the food chain by lining up in a row and holding the yarn to connect them and to demonstrate the flow of energy.

5. Have the student who is the rabbit leave the chain, and ask students what happens to the grass and fox when all the rabbits die? Students will say things like they will also die or they will need to find something else to eat. Let the rabbit rejoin the chain then ask students what else the fox could eat as an alternative to rabbit, and when a student answers, ask that student to go to the front of the room and connect the yarn from where that animal gets its energy to where its energy goes. For example, a student could say foxes also eat birds, so they would go to the front of the room as a bird and connect with the yarn to the fox. You would then ask what the bird eats and ask a volunteer to come up as, for example, an insect then connect the insect and bird with the yarn.

6. Ask students to think of other plants and animals that are either eaten by or eat the plants and animals in this food web. Challenge the class to have everyone join the web by thinking of a plant or animal that is connected to this food web. Ask probing questions like who eats a fox or where does the grass get its energy.

7. Once everyone in the class has joined the web, have the student who is a rabbit step away and now ask what happens to the food web. Discuss how in a food chain removing one piece caused it collapse, but in the food web, removing one species had less of an affect.

8. Discuss with students how diversity in ecosystems helps keep the ecosystem strong, and ask students to revise their definition of a balanced ecosystem.

9. Discuss with students the effect extreme environments (such as the desert or tundra) would have on the food web. Discuss how the food webs in these environments are more fragile because there are fewer species that have evolved to live in these conditions, so just like with the food chain, it takes less to disrupt the system.

Escape Artists

Activity: The Great Escape – Students research a variety of escape strategies that animals use in the wild and then challenge each other to design a new way for animals to escape from predators.

Grade Level: Middle School

NGSS Standard: MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Materials:

- ✔ Internet access
- ✔ Art supplies such as construction paper, tape, glue, scissors, pipe cleaners, and paper clips.

Description

1. Have students reflect on the Escape Artist exhibit in the **Animal Super Powers!® Exhibition**. Ask them what strategies the animals used to escape predators.
2. Ask students what other escape strategies they know about that other animals use. Write responses on the board.
3. Put students into groups and have them conduct research online about various strategies animals use to avoid predators. Write new findings on the board.
4. Assign each group a biome (tropical rainforest, temperate forest, desert, etc.). Tell students that each group needs to go online and write a description of their biome. They need to describe the types of flora, fauna, topography, and the climate.

5. Have students identify the main predators in their biome. Students need to identify how these predators catch their prey. For example, do they attack as a pack, or do they hide and wait for the prey to come to them?

6. Have students then brainstorm and design a made-up animal (prey) that would be best adapted to survive in their biome. They need to be sure to include the following characteristics

   a. Size

   b. Color

   c. If it's a herd or pack animal or not

   d. Diet

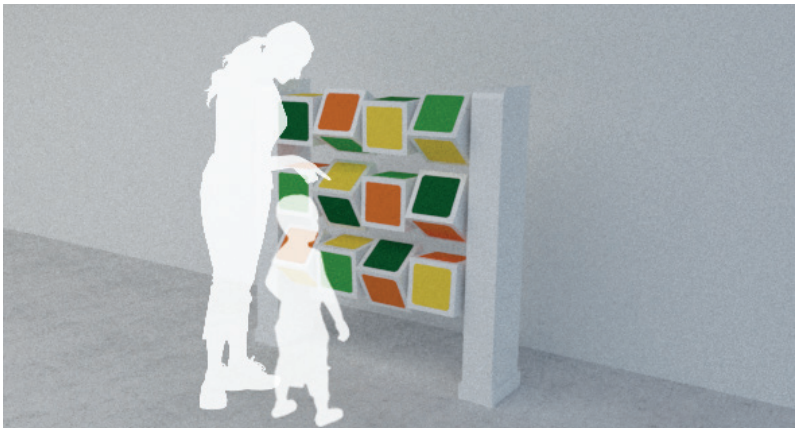
   e. Strategies to avoid predators

7. Have each group construct their animal using the art supplies and then present it to the class. During their presentation, students need to be sure to explain how their animal is designed specifically to survive in their biome.

8. After each group's presentation, ask the other groups to explain why this animal would or would not survive in their biome. For example, would the same animal be adapted to survive in the rainforest and in the tundra? Why or why not?

9. After all groups have presented, ask the class to identify which prey's escape strategies would be or would not be successful in multiple biomes.

10. Discuss the results of this activity. Have students think about what animals are able to live in multiple biomes and why. As a class or in groups, have students design an animal that is best able to escape predators in any habitat. If you have time, also discuss how many animals' climates are changing due to global warming, and discuss how these changes might affect predators and prey in the various habitats.



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Super Senses

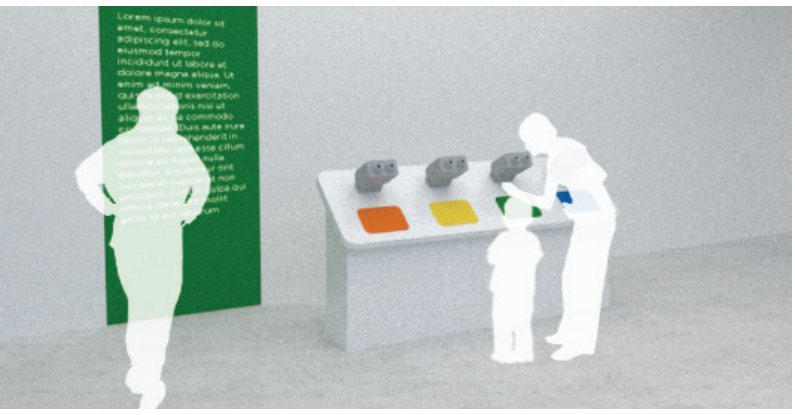
Activity: Sensory Detective – Students are challenged to use their five senses to identify various objects enclosed in a box. They will make their claims about which senses are more helpful in identifying various items based on the evidence they collect.

Grade Level: 4th Grade

NGSS Standard: 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Materials:

- ✔ At least 10 opaque containers
- ✔ Two sets of five different items labeled 1 to 5 such as a bar of soap, banana peel, a hockey puck, a seashell, and a dog leash



Description

1. Have students discuss the Super Senses they observed in the **Animal Super Powers!® Exhibition**. Talk about what made them super and then discuss what senses we have.
2. Go over the five senses (taste, touch, smell, sight, and hearing) and ask students to debate which are most valuable to them. There is no right answer. The goal is to get students thinking and discussing.
3. Tell students they are going to conduct an experiment where they use their senses to try to identify objects that are sealed in containers.
4. Put students in groups. Make groups whatever size is needed so that each group can have one container. Tell each group to make a table with five columns. Label the columns Container Number, Data, Senses, Claim, and Correct. Make five rows on the table labeled 1to 5.

5. Tell students that they are going to get a container with a mystery object in it. They need to try to use all of their senses to collect data and record it on the table. For example, data could be things like it smells fishy or it feels heavy.

6. Pass out one container to each group. Give students 5 to10 minutes to examine the container and write down their evidence. Don't let them make a claim or guess what it is yet. Tell them at this point they are just collecting data. Students can shake, smell, or observe the container. They can do anything but look inside. After a few minutes, have each group write down in the data column whatever they noticed. For example, smells fishy or feels heavy. In the senses column, students write which senses they used to collect their data and make a claim about what they think the object is.

7. Have students pass the container to another group and repeat step six until groups have had a chance to observe all five containers.

8. Collect containers and go over them one by one as a class. Before revealing what is inside, ask groups to share their evidence and claims about each one. Talk about which sense was most and least helpful in this experiment. Open each container to see if any of the groups were able to identify what was in the containers accurately. Discuss the results.

9. Have students think back to the Super Senses exhibit and discuss what super sense would have helped them with this experiment.

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Super Senses

Activity: Making Sense of Our Senses – Students conduct an experiment to determine which of their senses is best at identifying various foods.

Grade Level: Middle School

NGSS Standard: MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Materials:

- ✔ Blindfolds or something to cover students' eyes
- ✔ Four different types of food. *Any will do, but we recommend foods that have different textures, shapes, smells and may not be easy to identify just by looking at them. For example, a piece of the white from a hard-boiled egg, an orange wedge, a cube of bread, a piece of candy, a hunk of jerky, and cube of cheese. (Check with the students' food allergies or preferences before making your choices.)*

Description

1. While in the Super Senses exhibit in the **Animal Super Powers!® Exhibition** have students take notes on which senses are highlighted and then discuss which they think are most important for survival. As a class, debate different ideas.
2. When you return to class, ask students to identify the five senses (taste, touch, hearing, smell, and sight). Have students share which of these senses they identified as most valuable for survival.
3. Have students discuss which sense is most important to humans, and ask students if they could only have one of the five senses, which would it be?

4. Tell students they are going to conduct an experiment to determine which sense is most helpful identifying food. Have students make, share, and record their prediction on which sense will be most and least helpful to identify food. Note - for this experiment, students will only test taste, smell, feel and touch. Hearing will not be tested.

5. Put students in groups of four. Tell them that they are going to be given four different foods and need to identify that food by only using one sense.

6. Discuss with students how to run a controlled experiment and that they need to be sure to eliminate all variables except the one they are testing for. To block smell, they need to pinch their noses. To block sight, they need a blindfold. To block touch, they can't touch the food and need to have someone feed them the food. To block taste, they cannot ingest the food.

7. Tell students that they will first test for smell. Have one student in each group put on a blindfold and pinch their nose and have another student in their group put a piece of the food in their mouth. Each group should put a different type of food in the mouth of the student who is guessing to get more reliable data. After students have eaten the food, have them state and record they think the food is.

8. Have another student in each group test for smell. Have the student put on a blindfold and place the food in front of them. This should be a different food than what was just used. Without touching it, the student should smell the food and then state what they think the food is and groups record their answers.

9. Have the third student in the group test for touch by blindfolding them and having them pinch their nose with one hand and feel the food product with another. Have the student guess what the food is and have the group record the response.

10. Have the final student in the group test for sight. They should pinch their nose and not touch the food but try to identify it just by sight. Have the groups record the results.

11. Tally all the results on the board, and have students graph the results comparing which senses had the highest percentage of accurate guesses.

12. Discuss the results and talk about why some senses seem to be better at identifying foods than others.

13. As a class, talk about the flaws in this experiment. For example, some foods are more easily identifiable than others, or some students are better at identifying foods than others, or that the sample size was too small.

14. Have each group develop a new design for an experiment that better tests which senses best help identify food. Each group should share their idea, and as a class, choose one of the new experiments to test and conduct a second experiment the following day. Compare the results from day one and day two and discuss why the results were similar or different.

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Extreme Environments

Activity: Keeping Warm in the Cold – Students design and test a device that that models different features animals can have to survive in various climates.

Grade Level: 3rd to 5th Grade

NGSS Standard: 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Materials:

- ✔ 16-ounce clear water bottle with label removed
- ✔ Various art supplies (Styrofoam, colored paper, rubber bands, food coloring, cardboard boxes, etc.)
- ✔ Thermometer

Description

1. After visiting the Physical Feats exhibit in the **Animal Super Powers!® Exhibition**, discuss with students the various adaptations that animals made to be able to survive and thrive.
2. Discuss why maintaining body temperature is so important to the survival of all warm-blooded animals. Review with students how warm-blooded animals as opposed to cold-blooded animals need to keep their internal temperature steady to survive even when faced extremely hot or cold environments.
3. Ask students to discuss ways that animals have adapted to stay warm in cold climates. Some of the main adaptations are fur, fat, and color.

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4. Tell students that they are going to be challenged with designing and constructing an animal's outer shell or coat that prevents changes in the animal's temperature. Their design needs to be able to hold a bottle of water which will represent the animal's body temperature. Each group will receive a bottle full of water and will test how their design helps the water resists temperature change.

5. Talk to students about coolers, thermal mugs, and other things that are commonly used to keep beverages warm or cold. Brainstorm ways students can construct their design to contain some of these features.

6. Have groups discuss and sketch their design. Once you have seen their ideas, give groups their water bottle and other materials. Give students time to construct their design.

7. After groups are done constructing, have them record the initial temperature of the water in their bottle and place it in their design. Place each group's design with the water bottle inside in a freezer and wait for an hour. Remove the water bottle, take and record the temperature inside the bottle, and have each group calculate the change to its initial temperature.

8. Have students share their results and discuss why some models worked better than others. What were some of the common design features?

9. Assuming it is hot enough outside, have students fill the water bottle up with room temperature water and record its temperature. Groups then place their bottles in the sun for an hour and record the change in temperature to the water.

10. Students should discuss how and why the models did better or worse in the cold as compared to the heat.

11. Come back together as a class, and discuss the results. Have groups talk about why they think some designs resisted cold better and why some resisted heat better. Ask students if they were to make another model, what improvements they would make. To conclude, ask students how their results are seen in nature. Are there any animals that have physical features that are reflected in their models?

Extreme Environments

Activity: Where Do I Live? – Students study a variety of extreme environments and the animals that live there. Students are then given a list of characteristics about an animal and need to match where the animal lives based on what they've learned about the different environments.

Grade Level: 3rd

NGSS Standard: 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Materials:

- ✔ Internet access

Description

1. Have students reflect on the Extreme Environments exhibit in the **Animal Super Powers!® Exhibition**. Discuss what made these environments extreme and what adaptations the animals that lived there had.
2. Tell students that they are going to be put into groups and each group is going to research and present their findings about a specific type of environment.
3. Put students in the following groups: tropical rainforest, savannah, deserts, chaparral, and tundra.

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4. Have groups go online and to research their environment. Tell students they can take notes on anything they find interesting about their environment but are required to identify the following characteristics:
    a. Average temperature in winter and summer
    b. Types of flora (plants that are most common)
    c. Common mammals that live there
        i. Each mammal's size
        ii. Each mammal's diet
    d. Common birds that live there
        i. Each bird's size
        ii. Each bird's diet
5. Have each group present their findings and have the other groups take notes on the presentations or record the notes on the board.
6. As a class, discuss the similarities and differences of the environments.
7. Tell students that they are now going to describe a number of animals, and based on the animal's characteristics and what they know about the various biomes, each group will predict which environment they think the animal lives in.
8. Read the following one at a time. When finished reading, have each group discuss and make predictions about which environment they think the animal lives in.
    a. "I'm long, skinny and cold blooded. I like the heat. I mostly eat small rodents and am hunted by larger predators like coyotes and large birds."

        (**Answer:** rattlesnake. Lives in the desert or chaparral.)
    b. "I'm a small mammal who is super fast. I have large ears to help keep my body temperature low. I need mixed grasses, forbs and shrubs for food and small trees and brush for cover.

        (**Answer:** jackrabbit or hare. Lives in chaparral.)

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c. "I am huge and white to blend in to my environment. I'm an omnivore but mostly eat seals. While I'm able to swim in the freezing waters around me, I live mostly on land."

(**Answer:** polar bear. Lives in the tundra.)

d. "I'm a primate who likes to be up in the trees. I live mostly off nuts and fruits, and I live in a group with a few dozen of my species."

(**Answer:** spider monkey. Lives in tropical rainforest.)

9. After you have read all the statements, give groups time to make and share their predictions about which type of environment each animal lives in. Also have groups guess what animal it is that you described.

10. Share answers with the class, and discuss why students did or did not get the correct answers.

11. Talk as a class about why groups did or did not predict the correct environment. What additional information was needed for each animal? Discuss if it is possible that some of these animals could live in more than one of these environments.

12. As a class, have a discussion about the relationship between animals and their environments. Have students discuss what type of environment humans came from, and ask how we are able to now live in any type of environment.

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Physical Feats: Color

Activity: Camouflage Chameleon – Camouflage is one of the most common adaptations seen in animals. In this activity, students conduct an experiment to test how effective camouflage is in helping prey stay away from predators.

Grade Level: Middle School

NGSS Standard: MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

Materials:

- ✔ Construction paper of various colors
- ✔ Hole punch-outs of various colors (the tiny circles made when using a hole punch)
- ✔ White hole punch-outs (12 for each student)
- ✔ Colored pencils, markers, or crayons
- ✔ Scissors
- ✔ Graph paper
- ✔ Printouts of various environments such as the rainforest, savannah, mountains, countryside, etc.

Description:

1. Ask students to define camouflage and ask them to name any animals they know of that are camouflaged. Ask students to discuss why these animals are camouflaged. Discuss how animals are often camouflaged to help prey hide from predators.
2. Put students in groups, and tell them that they are going to conduct a test to see how effective camouflage is in hiding from predators. Pass out a different colored sheet of construction paper to each group and then spread out an assortment of various colored hole punch outs on their paper. For example, a group could have a brown piece of construction paper and have 20 brown hole punch-outs, 20 yellow punch-outs, 20 blue punch-outs and 20 red punch-outs mixed on their paper. The color of the construction paper should match one of the colors of the hole punch-outs.

3. Tell students that they are going pretend to be predators and their prey are the hole punch-outs. Give them 15 seconds to capture as many prey as they can. Tell them the only rule is that they can only capture one prey at a time. (No sweeping up prey).

4. When time is up, have groups tally their results and record how many of each color they collected then randomly spread all the hole punch-outs back on the construction paper. Repeat this process four times.

5. Have groups graph and share their results. The graph should show which color punch-outs were caught the most and the least. As a class, discuss why they got the results they did and talk about why it was harder to find the hole punch-outs that blended into the construction paper. Ask students how this models real life and how it is also an oversimplification.

6. Tell students that they are now going to be challenged with designing their own camouflage that is best designed to specific environments.

7. Pass out one of the environment printouts to each group and a dozen white hole punch outs to each student. Challenge students to camouflage their punch-outs to best blend into the overall environment. Give students five minutes to design and color one hole punch-out, in multiple colors if they choose, that will blend with the overall environment of the printout. Once they have designed the one camouflage punch-out, use the same colors and design to color the remaining 11 punch-outs.

8. After students have finished making their punch-outs, have everyone in the group randomly place them on their environment printout and pass it to another group.

9. Have students go though the same process as they did in step three and step four. Groups need to record and graph their data and share it with the class. The goal is to identify which punch-outs were the hardest to "hunt."

10. Discuss what kind of camouflage did the best in this experiment and why. Ask students to discuss what changes they would make to improve how camouflaged their hole punch-outs were and how to improve the experiment to get more accurate results.

11. Talk to students about the importance of color in animals, not just for camouflage but for other purposes as well (temperature regulation, attracting mates, warning off predators, etc.)

12. Discuss with students what camouflage was most successful in various environments.