HOUSTON MUSEUM
of NATURAL SCIENCE

Extreme Animals: Unlocking Nature's Superheroes

As you explore this exhibit, you'll discover how animals use extraordinary adaptations—like nature's own superheroes—to survive. Your mission is to investigate these abilities, solve challenges, and understand what makes each animal uniquely equipped for survival.

To help you answer the questions:

- **Read the text panels in each gallery**—they have important information and clues.
- **Observe the animals and specimens closely** to spot their special features and behaviors.
- **Use the bold gallery titles and the underlined titles** to match each part of the exhibit with the questions.

Gallery 1: What Is Adaptation?

<u>Eating</u>
Animals have special adaptations that help them find, catch, and eat their food. Imagine you are a member of an elite team of animal superheroes, each with unique food-related adaptations. Which animal superhero would you choose to become—an owl with a sharp beak and talons, a porcupine with strong teeth for chewing tough plants, or an emerald tree boa with heat-sensing pits for detecting prey?

Explain your choice and describe how this animal's adaptations help it get food and survive in its environment.

Super Camouflage

Imagine you are part of a team of animal superheroes who use camouflage to survive. Which animal superhero would you choose to become—Mossy the Frog, who looks like a clump of moss; Twiggy the Stick Insect, who resembles a twig or branch; or Leafy the Mantis, who appears and moves like a dead leaf? Explain your choice and describe how this animal's camouflage adaptation helps it avoid predators or catch prey.

Super Sturdy: Earth's Mightiest Heroes

Some superheroes have remarkable abilities inspired by nature's giants. Imagine a superhero with powers modeled after creatures like the rhinoceros beetle or Arctic tern. Use mathematical reasoning to explore these powers:

- **Super Strength:** If your superhero weighs 120 pounds and can lift 850 times their weight like a rhinoceros beetle, how much can they lift?

  Equation: *Amount lifted=Body weight×850.*

- **Long-Distance Migration:** If a superhero's career lasts 34 years and they travel 1,836,000 miles (like an Arctic tern), how many complete 50,000-mile migrations do they accomplish?

  Equation: Number of complete migrations = Total miles traveled/Miles per migration

Super-Size

Design a hybrid creature that combines traits from both the humpback whale and the hummingbird. Describe its main adaptations, how these features help it survive, and how it would find food or escape predators. What challenges might it face if its environment changed quickly? Draw your creature and its adaptations.

Super Defenses

Imagine you are part of a team of animal superheroes who use amazing defenses to survive. Which animal superhero would you choose to become—Bombardier Beetle, who sprays hot chemicals; Turkey Vulture, who uses projectile vomiting; or Six-Banded Armadillo, who burrows and jumps to escape danger?

Explain your choice and describe how this animal's defense adaptations help it stay safe from predators or threats

Super Speed: Life in the fast Lane

Compare the peregrine falcon and the cheetah—two of nature's fastest animals—by creating a Venn Diagram that shows how their speed-related features are similar and different. After completing your diagram, decide which animal you think has the most impressive speed adaptation and explain why.

Gallery 2 – Extreme Powers

Shape Shifting

Animals have incredible powers like camouflage, limb regrowth, and role-shifting. Which of these would be most helpful in a constantly changing environment, and why?

Mind Control

Some parasites manipulate their hosts. *ToxoMastermind* (Toxoplasma *gondii*) is one such villain. How does it use its abilities to survive?

Bonus Question: How can understanding co-evolution help hosts resist such manipulation?

Biofluorescence

Design a superhero inspired by biofluorescence. Explain how they use their unique abilities to fight crime or solve mysteries—like using biofluorescence for communication or camouflage. Draw your superhero.

Invincibility: Living Life to the Limits

Roach Girl's Survival Challenges: Explain how this cockroach-based superhero survives three deadly scenarios: a hydraulic press crushing her with 900 times her weight, laser beams slicing her head off, and robot drones stabbing her vital organs. Describe the biological adaptations (e.g., exoskeleton strength, decentralized nervous system, regenerative abilities) that allow her to withstand each attack.

Gallery 3 – Extreme Cold

Choose an Arctic superhero—Blizzard Bear (Polar Bear), Freeze Frog (Wood Frog), or White Wing (Snowy Owl). Describe the "superpowers" this animal has, such as frost resistance or hibernation, and explain how these abilities help it survive Arctic threats like climate change or habitat loss.

Gallery 4 – Extreme Heat: Flame On!

Choose two Sahara Desert animals to help Captain Biome defeat Dr. Drought. How do their adaptations allow them to survive extreme daytime heat, and how do they cope with freezing nighttime temperatures? Explain why these animals are ideal allies for battling threats in the desert environment.

Gallery 5 – Extreme Dark: Owl Night Long

Which animal would be your sidekick for nighttime missions? What special power does it bring to help you succeed in the dark?

Gallery 6 – Super Survivors: Who Is Going To Stop Me?

Choose three “ancient animals”. Create a comic strip showing how they could work together to survive a mass extinction event, using their unique adaptations and abilities.