HEADWATERS SCIENCE CENTER
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Exhibit Alignment to Minnesota State Grad Standards (MN Stand)

Simply click on Table of Content subject and the hyperlink will take you to the page:

EXHIBITS:

Name of Exhibit: Freshwater Aquariums

Description: The freshwater aquariums are warm water tanks featuring tropical freshwater fish, and cold-water tanks featuring mostly local species. We also have local fish species housed in tanks with some of our turtles.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1L 4.1.1.1, 1L 4.2.1.2
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.1.1.1, 4L 4.2.1.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science & Earth Science (Bold)

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in fresh water fish and other living things.
2. I can explain how patterns in the behavior of fresh water fish and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among fresh water fish (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC fresh water fish to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that fresh water fish have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

1. What differences can you see between fresh water fish and other animals? What similarities can you see between fresh water fish and other animals?
2. What human invention mimics fresh water fish characteristics?
3. What do fresh water fish do to protect themselves from enemies?
4. How do variations in characteristics among fresh water fish (same species) provide advantages?
5. What are strategies fresh water fish use to survive? Why are the strategies successful? Why aren't some strategies successful?
6. What variations are the result of inherited traits from parents of fresh water fish?

Key Vocabulary in Demo: Adaptation, Camouflage, Coldblooded, Fins, Gills, Habitat, Reproduction, Scales, Traits

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Aquariums Saltwater

Description: The HSC saltwater aquariums are warm water tank featuring tropical fish and invertebrate species. Most species present are native to the Indo-Pacific region around Australia and Indonesia.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1L 4.1.1.1, 1L 4.2.1.2
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1, 4L 4.2.1.1
4L 4.1.1.1, 4L 4.2.1.2
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 8th Grades

Content Area(s): Life Science

Learning Target(s):

Essential Question(s):

1. I can ask questions from observations about the similarities and differences found in saltwater fish and other living things.
2. I can explain how patterns in the behavior of saltwater fish and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among saltwater fish (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC saltwater fish to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that saltwater fish have traits inherited from parents and that variations of these traits exist in a group of similar organisms.
6. What variations are the result of inherited traits from parents of saltwater fish?

Key Vocabulary in Demo: Adaptation, Camouflage, Coldblooded, Fins, Gills, Habitat, Scales

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Augmented Reality Sandbox

Description: The Augmented Reality Sand Box holds sand in the box with colors that change. The changes happen ba sed on the elevation of the sand, similar to a topographic map. As an additional feature, make "rain" (holding hand a bove the exhibit) and observe how the water moves on the "map" showing where the waters move
acting as a model of a watershed.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0P 2.1.1.1
1E 2.2.1.1, 1E 4.1.2.1
3P 1.2.1.1
4E 1.1.1.2, 4E 2.2.1.1, 4E 3.1.1.1
6E 3.1.1.3, 6E 4.1.1.1

Grade Level(s): Kindergarten through 6th Grades

Content Area(s): Earth and Space Science; Physical Science

Learning Target(s):

1. I can make an argument with evidence to evaluate multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
2. I can provide measurements from observations that provide evidence of the effects of weathering and erosion by the forces including water, wind, temperature, and vegetation.
3. I can make an argument based on evidence for how geoscience processes have changed Earth's surface at varying times and spatial scales.

Essential Question(s):

1. What are ways to prevent wind and/or water from changing the shape of the land?
2. How can weather affect changes in the shape of the land?
3. What are the effects of weathering and erosion?

Key Vocabulary in Demo: Elevation, Environment, Erosion, Geoscience, Ground Water, Minerals, Natural Resources, Rock Formation, Topographic, Watershed, Weathering

Name of Exhibit: Bear Den

Description: The HSC Bear Den is an opening in the wall with a teddy bear inside. Guests are encouraged to think about the different types of homes that animals have and how all animals need shelter.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1, 0L 3.2.2.1
1L 3.2.2.2, 1E 4.1.1.1
2L 4.1.1.1
3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.1.1.1
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.2.1

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science, Earth

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in bears' habitats and other living things.
2. I can explain how habitats can help parents and their offspring survive.
3. I can explain, using evidence, how variations in characteristics among animal's habitats (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about HSC's bear den to explain the strategies a variety of animals use to survive.

Essential Question(s):

1. What differences can you see between several different animals' habitats? What similarities can you see between several different animals' habitats?
2. What human's habitats mimics animal's habitats?
3. What habitats help animals to protect themselves from enemies? bears, skunks...protect themselves? etc.
4. How do variations in characteristics among animal's habitats provide advantages?
5. How do habitats help animals to survive? Why are the strategies successful? Why aren't some strategies successful?

Key Vocabulary in Demo: Amphibians, Bears, Biome, Camouflage, Habitat, Mammals, Predator, Prey, Reptiles, Vertebrates vs Invertebrates, Warm-Blooded vs Cold-Blooded

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Bernoulli Ball

Description: The Bernoulli Ball, named after Daniel Bernoulli, renowned Swiss mathematician and physicist, is an exhibit that has the guest or visitor press a button to turn on the fan and watch the ball float. The air pushes the ball up, while gravity drags it down. Moving fluids (and also air) have a lower pressure than stationary fluids, so the surrounding stationary air keeps the ball in the column of moving air even if the column is moved.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0P 2.2.1.1, 0P 4.1.1.1,
2P 1.1.1.1, 2P 2.2.1.1
5P 1.1.1.1,
6E 3.1.1.1
8P 1.2.1.2

Grade Level(s): Kindergarten through 8th Grades

Content Area(s): Earth and Life Science

Learning Target(s):

1. I can identify and describe patterns that show the effects of different strengths of different directions of pushes and pulls on the motion of an object.
2. I can ask questions from conducting investigations about how things move.
3. I can identify and predict quantitative patterns of the effects of balanced and unbalanced forces on the motion of objects.
4. I can ask investigative questions and make predictions using information from observations about changes in energy, related to speed, when two objects interact.
5. I can plan and conduct an investigation that provides evidence that a change in an object's motion depends on the sum of the forces on the object and the mass of the object.

Essential Question(s):

1. What are the effects of pushes and pulls on the motion of an object?
2. What are the forces that make an object move, stop, change direction or slow down?
3. How does the speed and direction change of two colliding objects?
4. What happens to an object when forces are applied to the object, and what effect does the mass of the object have on the motion?

Key Vocabulary in Demo: Bernoulli (Ball), Experiment(s), Force, Gravity, Inertia, Mass, Motion, Wind

Prerequisite Terms: Behavior, Differences, Model, Observation, Patterns, Relationship, Similarities, Strategies

Name of Exhibit: Big Blue Blocks

Description: The big foam blocks can be used to build large structures. Includes cylindrical blocks to facilitate extra stability for taller structures. Use cylindrical to build moving parts. Blocks can be used to construct experiments about geological history, motion, mass, change, speed, gravity, force, etc. Also, features blocks and balls to make ball runs.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

2P 1.1.1.1, 2P 2.2.1.1,
4E 3.2.1.1,
5P 1.1.1.1, 5P 3.2.1.1
6E 3.2.1.1, 6E 4.1.1.1
7L 2.1.1.2
8P 1.2.1.2

Grade Level(s): Kindergarten through 8th Grades

Content Area(s): Earth and Space Science

Learning Target(s):

6. I can investigate why an item I observe is in motion.
7. I can ask and pose answers to questions by conducting investigations on how things move.
8. I can investigate the effects of objects of different and the same mass on each other.
9. I can make a model to help explain how things change over time.
10. I can make a model that shows how differences in mass and speed can change outcomes.
11. I can show how the speed of an item is related to the amount of energy that object has.
12. I can model how different rock strata can show how things have changed over time.
13. I can model how different processes change the earth slowly and more rapidly.
14. I can analyze data and model how life forms have changed over time.
15. I can demonstrate that a change in an object's motion depends on the forces and mass of an object.

Essential Question(s):

1. How and why do things move?
2. How do objects of different masses affect each other?
3. How can I show why things have changed over time?
4. How do mass and speed affect results of interactions between objects?
5. How do I measure how much energy is in an object traveling at different speeds?
6. How can I show how things have changed over time throughout history?
7. What are the different processes that change the earth?
8. How do I show how some earth processes change the earth slowly and others more quickly?
9. How can I demonstrate the relationship between the forces exerted and the mass of an object will help determine its motion.

Key Vocabulary in Demo: Blocks, Energy, Features, Mass, Motion, Speed, Stability, Structure

Prerequisite Terms: Change, Difference, Exert, Force, Observation, Pattern, Process, Similarity, Model, Relationship

Name of Exhibit: Bones and Skulls

Description: The HSC bones and skulls are rotating skeletal specimens from the HSC collection. This may also include replica specimens, either casts (such as the hominid skulls) or in-house 3D prints.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1E 4.1.1.1
2L 4.1.1.1
3L 3.2.1.1, 3L 4.1.1.1
4L 4.1.1.1
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science, Earth

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in bones and skulls and other living things.
2. I can explain, using evidence, how variations in characteristics among bones and skulls (same species) may provide advantages in surviving, finding mates, and reproducing.
3. I can apply my knowledge about specific HSC bones and skulls to explain the strategies a variety of animals use to survive.
4. I can obtain information from resources to determine that bones and skulls have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

1. What differences can you see between two bones or skulls and other animals? What similarities can you see between two bones or skulls and other animals?
2. What human invention mimics bones and skulls characteristics?
3. What do bones and skulls help to protect the animals from enemies? bears, skunks...protect themselves? etc.
4. How do variations in characteristics among different bones and skulls (same species) provide advantages?
5. What are strategies help bones and skulls use to survive? Why are the strategies successful? Why aren't some strategies successful?
6. What variations are the result of inherited traits from parents of that can been seen in bones and skulls?

Key Vocabulary in Demo: Reptiles, Birds, Mammals, Fish Vertebrates vs Invertebrates, Camouflage, Warm-Blooded vs Cold-Blooded, Predator, Prey, Habitat, Biome.

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Doves

Description: The HSC has 2 to 4 doves in the aviary near the front entrance. The two adults regularly lay eggs, which hatch into chicks, and then proceed to grow into juveniles that can fly, all in a matter of a few weeks, allowing regular visitors to see the progress from egg to near-adulthood on a regular basis.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1E 4.1.1.1
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1
4L 4.2.1.2
7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in doves and other living things.
2. I can explain how patterns in the behavior of adult/parent doves and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among doves (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC doves to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that doves have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

1. What differences can you see between doves and other animals? What similarities can you see between doves and other animals?
2. What human invention mimics dove characteristics?
3. What do doves do to protect themselves from enemies?
4. How do variations in characteristics among doves (same species) provide advantages?
5. What are some dove behaviors you observe that you think would help them survive?
6. What variations are the result of inherited traits from parents of doves?

Key Vocabulary in Demo: Aviary, Beak, Biome, Birds, Camouflage, Cold-blooded, Eggs, Feathers, Habitat, Invertebrates, Predator, Prey, Skeleton, Vertebrates, Warm-blooded, Wings

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Finch

Description: The Headwaters Science Center currently have sixteen finches in an aviary near the front entrance. There are multiple species present, which invites conversations about how animals interact with one another in the wild. The fact that there are multiple species, but they are all still "finches" also invites conversations about how we categorize animals into groups.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1E 4.1.1.1
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1,
4L 4.1.1.1,
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 3.2.1.4, 7L 4.1.1.2

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science, Earth Science

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in finches and other living things.
2. I can explain how patterns in the behavior of finches and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among finches (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC finches to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that finches have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

1. What differences can you see between two finches and other animals? What similarities can you see between two finches and other animals?
2. What human invention mimics finch characteristics?
3. What do finches do to protect themselves from enemies?
4. How do variations in characteristics among finches provide advantages?
5. What are strategies finches use to survive? Why are the strategies successful? Why aren't some strategies successful?
6. What variations are the result of inherited traits from parents of finches?

Key Vocabulary in Demo: Beak, Biome, Birds, Vertebrates vs Invertebrates, Camouflage, Feathers, Habitat, Predator, Prey, Skeleton, Warm-Blooded vs Cold-Blooded, Wings

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Insects

Description: For insects, HSC has live cockroaches and walking sticks (also some mounted specimens). Most of the animals we have at HSC are vertebrates, their most recent common ancestry with insects is over 500 million years ago. They have lots of unique physical features and characteristics.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0P 2.1.1.1, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1E 4.1.1.1, 1L 4.2.1.2
2L 3.2.2.1, 2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.1.1.1
5L 4.1.2.1
7L 2.1.1.1, 7L 2.2.1.1, 7L 3.2.1.1, 7L 4.1.1.2, 7L 4.1.2.1

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science, Earth Science

Learning Target(s):

6. I can ask questions from observations about the similarities and differences found in insects and other living things.
7. I can explain how patterns in the behavior of insects and their offspring help offspring survive.
8. I can explain, using evidence, how variations in characteristics among insects (same species) may provide advantages in surviving, finding mates, and reproducing.
9. I can apply my knowledge about specific HSC cockroaches and walking sticks to explain the strategies a variety of animals use to survive.
10. I can obtain information from resources to determine that insects have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

7. What differences can you see between insects and other animals? What similarities can you see between two insects and other animals?
8. What human invention mimics cockroach and walking stick characteristics?
9. What do cockroaches and walking sticks do to protect themselves from enemies?
10. How do variations in characteristics among insects (same species) provide advantages?
11. What are strategies cockroaches/walking sticks use to survive? Why are the strategies successful? Why aren't some strategies successful?
12. What variations are the result of inherited traits from parents of insects?

Key Vocabulary in Demo: Insects, Abdomen, Antennae, Biome, Camouflage, Cold-Blooded vs Warm-Blooded, Habitat, Head, Herbivore, Life Cycle, Nocturnal, Predator vs Prey, Thorax, Vertebrates vs Invertebrates

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Lizards

Description: The HSC lizards are of various sizes and origins in Critter Corner (HSC). Lizards are a great example of a really diverse group of animals, very well illustrating specific adaptions to the environmental pressures they would encounter in the wild. It is fun to talk about the differences between snakes and lizards.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1E 4.1.1.1, 1L 4.2.1.2
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.1.1.1, 4L 4.2.1.2
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 5th Grades

Content Area(s): Life Science, Earth Science

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in lizards and other living things.
2. I can explain how patterns in the behavior of adult/parent lizards and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among lizards (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC lizards to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that lizards have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

6. What differences can you see between two lizards and other animals? What similarities can you see between two lizards and other animals?
7. What human invention mimics lizard's characteristics?
8. What do lizards do to protect themselves from enemies (bears, skunks, etc.)?
9. How do variations in characteristics among lizards (same species) provide advantages?
10. What are strategies lizards use to survive? Why are the strategies successful? Why aren't some strategies successful?
11. What variations are the result of inherited traits from parents of lizards?

Key Vocabulary in Demo: Biome, Camouflage, Cold-Blooded, Habitat, Predator, Prey, Reptiles, Resources, Vertebrates

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Pitching Cage

Description: The pitching cage is a RADAR gun used to measure speed of pitches. The gun depends on the doppler effect, measuring the perceived distortion of emitted radio waves as they bounce off the moving ball and come back to the receiver.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0P 2.2.1.1, 0P 4.1.1.1
2P 1.1.1.1
5P 1.1.1.1, 5P 3.2.1.1
8P 1.2.1.2, 8P 2.1.1.2

Grade Level(s): Kindergarten through 8th Grades

Content Area(s): Physical Science

Learning Target(s):

1. I can identify and describe patterns that show the effects of different strengths of different directions of pushes and pulls on the motion of an object.
2. I can ask questions from conducting investigations about how things move.
3. I can ask investigative questions and make predictions using information from observations about changes in energy, related to speed, when two objects interact.
4. I can create an explanation based on evidence relating to the speed of an object to the energy of the object.
5. I can construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass and speed of an object.

Essential Question(s):

1. What are the effects of pushes and pulls on the motion of an object?
2. What are the forces that make an object move, stop, change direction or slow down?
3. How does the speed and direction change between two colliding objects?
4. What is speed? How is speed affected by energy?
5. What are the relationships of kinetic energy and the mass and speed of an object?

Key Vocabulary in Demo: Doppler Effect, Experiment(s), Force, Gravity, Inertia, Mass, Motion, Wind

Prerequisite Terms: Behavior, Differences, Model, Observation, Patterns, Relationship, Similarities, Speed, Strategies

Name of Exhibit: Snakes

Description: HSC Snakes come in a variety of sizes from the size of a pencil to more than seven feet in length. HSC snakes eat mice and rats, which are shipped frozen to HSC but thawed to room temperature and heated to normal body temperature just before feeding them to the snakes on HSC Snake Feeding Day. In the wild, HSC snakes eat small mammals, birds, amphibians, fish and other reptiles.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.2.1.2
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2, 7L 4.1.2.2

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in snakes and other living things.
2. I can explain how patterns in the behavior of adult/parent snakes and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among snakes (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC snakes to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that snakes have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

6. What differences can you see between two snakes and other animals? What similarities can you see between two snakes and other animals?
7. What human invention mimics snake characteristics?
8. What do snakes do to protect themselves from enemies (raptors, bears, cats, skunks, etc.)?
9. How do variations in characteristics among snakes (same species) provide advantages?
10. What are strategies snakes use to survive? Why are the strategies successful? Why aren't some strategies successful?
11. What variations are the result of inherited traits from parents of snakes?

Key Vocabulary in Demo: Biome, Camouflage, Cold-Blooded, Habitat, Invertebrates, Predator, Prey, Reptiles, Vertebrates, Warm-Blooded

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Tarantulas

Description: The HSC tarantulas, similarly to snakes, are often maligned among "Critters". We only do very limited contact with them, currently. Tarantulas will go through many different defensive postures when feeling threatened before biting, so they are useful when discussing how many animals really don't want to attack or fight a human. It is valuable to about the differences between arachnids and the other arthropods.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.1, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2, 1E 4.1.1.1, 1L 4.2.1.2
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.1.1.1, 4L 4.2.1.2
5L 4.1.2.1
7L 2.1.1.1, 7L 2.2.1.1, 7L 3.2.1.1, 7L 3.2.1.4, 7L 4.1.1.2, 7L 4.1.2.1

Grade Level(s): Kindergarten through 7th Grades

Content Area(s): Life Science, Earth Science

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in tarantulas and other living things.
2. I can explain how patterns in the behavior of tarantulas and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among tarantulas (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC tarantulas to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that tarantulas have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

1. What differences can you see between tarantulas and other animals? What similarities can you see between two tarantulas and other animals?
2. What human invention mimics tarantulas?
3. What do tarantulas do to protect themselves from enemies?
4. How do variations in characteristics among tarantulas (same species) provide advantages?
5. What are strategies tarantulas use to survive? Why are the strategies successful? Why aren't some strategies successful?
6. What variations are the result of inherited traits from parents of tarantulas?

Key Vocabulary in Demo: Abdomen, Antennae, Biome, Camouflage, Habitat, Head, Herbivore, Insects, Life Cycle, Nocturnal, Predator, Prey, Thorax, Vertebrates vs Invertebrates, Warm-Blooded vs Cold-Blooded

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Trout

Description: The HSC trout arrived at the center in the November as eggs, and grow throughout the year, allowing guests to see many phases of their juvenile lives before they are released as part of the DNR's stocking program. We also have some that we've kept and have develop even further, so that now the older life phases are on exhibit.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 1.1.1.1, 1L 3.1.1.1, 1L 3.2.2.2
2L 4.1.1.1
3L 3.1.1.2, 3L 3.2.1.1, 3L 4.1.1.1
4L 4.1.1.1
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 5th Grades

Content Area(s): Life Science, Earth

Learning Target(s):

1. I can ask questions from observations about the similarities and differences found in trout and other living things.
2. I can explain how patterns in the behavior of adult/parent trout and their offspring help offspring survive.
3. I can explain, using evidence, how variations in characteristics among trout (same species) may provide advantages in surviving, finding mates, and reproducing.
4. I can apply my knowledge about specific HSC trout to explain the strategies a variety of animals use to survive.
5. I can obtain information from resources to determine that trout have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

1. What differences can you see between two trout and other animals? What similarities can you see between two trout and other animals?
2. What human invention mimics trout characteristics?
3. What do trout do to protect themselves from enemies? How about bears, skunks, etc.
4. How do variations in characteristics among trout (same species) provide advantages?
5. What are strategies trout use to survive? Why are the strategies successful? Why aren't some strategies successful?
6. What variations are the result of inherited traits from parents of trout?

Key Vocabulary in Demo: Adaptations, Camouflage, Coldblooded, Fins, Gills, Habitat, Scales

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation

Name of Exhibit: Turtles

Description: The Headwaters Science Center has several turtles and tortoises of varying species. Vinny, the slider, is useful for talking about invasive species. Rosie, the snapping turtle, is often used for talking about albinism and introductory genetics. Sunny, the tortoise, invites conversations about the animal rehabilitation process, as well as hibernation. Comparing the shape of the shells between turtles allows one to talk about different lifestyles. Turtles are also one the few carrion eaters housed at HSC.

For all ages.

MN SCIENCE Grad Stand/Strand/Sub-strand: Number####:

0L 1.2.1.2, 0L 2.1.1.3, 0L 3.1.1.1
1L 3.1.1.1, 1L 3.2.2.2
3L 3.2.1.1, 3L 4.1.1.1, 3L 4.2.1.1
4L 4.2.1.2
5L 4.1.2.1
7L 2.1.1.1, 7L 3.2.1.1, 7L 4.1.1.2

Grade Level(s): Kindergarten through 5th Grades

Content Area(s): Life Science, Earth

Learning Target(s):

6. I can ask questions from observations about the similarities and differences found in trout and other living things.
7. I can explain how patterns in the behavior of adult/parent trout and their offspring help offspring survive.
8. I can explain, using evidence, how variations in characteristics among trout (same species) may provide advantages in surviving, finding mates, and reproducing.
9. I can apply my knowledge about specific HSC trout to explain the strategies a variety of animals use to survive.
10. I can obtain information from resources to determine that trout have traits inherited from parents and that variations of these traits exist in a group of similar organisms.

Essential Question(s):

7. What differences can you see between two trout and other animals? What similarities can you see between two trout and other animals?
8. What human invention mimics trout characteristics?
9. What do trout do to protect themselves from enemies? How about bears, skunks, etc.
10. How do variations in characteristics among trout (same species) provide advantages?
11. What are strategies trout use to survive? Why are the strategies successful? Why aren't some strategies successful?
12. What variations are the result of inherited traits from parents of trout?

Key Vocabulary in Demo: Adaptations, Camouflage, Coldblooded, Fins, Gills, Habitat, Scales

Prerequisite Terms: Adaptation, Advantage, Behavior, Characteristics, Differences, Function, Lineage, Mimic, Model, Observation, Patterns, Protect, Range, Relationship, Similarities, Strategies, Structure, Traits, Variation