



Animal Coverings

Grade: 1

Subject Areas:

Life Science, Investigation and Experimentation

Skills: classifying, drawing, observing, graphing

Duration: 1 hour

Connections:

animals, adaptations, ecology, evolution, textures, wildlife

Vocabulary

reptiles

scales

cold blooded

warm blooded

birds

feathers

mammals

fur

Objective:

Students will learn about basic differences between mammals, birds, and reptiles and will classify them accordingly.

Materials

- pictures of different animals
- 4 x 4 cards of cut out pictures
- classification pages
- examples of feathers, fur and scales
- scissors and glue
- microscope set
- prepared microscope slides
- samples of assorted simulated animal coverings
- scissors and glue
- drawing paper
- pencils and marking pens

Standards

Strands: Excellence in Environmental Education Guidelines

Strand 1 — Questioning and Analysis: E) Organizing information: Learners are able to describe data and organize information to search for relationships and patterns concerning the environment and environmental topics **G) Developing explanations:** Learners can develop simple explanations that address their questions about the environment.

Strand 2 — Knowledge of Environmental Processes and Systems Strand 2.2 The Living Environment: A) Organisms populations, and communities: Learners understand basic similarities and differences among a wide variety of living organisms. They understand the concept of habitat.

B) Heredity and Evolution: Learners understand that plants and animals have different characteristics and that many of the characteristics are inherited.

C) Systems and connections: Learners understand basic ways in which organisms are related to their environments and to other organisms.

California State Educational Standards:

Life Sciences 2a: Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

Investigations and Experimentation (I and E) 4a. Draw pictures that portray some features of the thing being described.

Background

Classifying Animals

The world of animals is diverse and amazing. Animals can live in the most inhospitable places from the freezing polar regions to the hottest sub-equatorial deserts. They can inhabit extreme environments like the hot springs of Yellowstone or the deepest parts of the ocean. They can live in caves, coral reefs and canyons. About 2 million different species of animals have been identified worldwide so far.

Animals come in all sorts of sizes and shapes. They range in length from tiny rotifers .05 millimeters long to Baleen whales 25 meters (82 feet) long. They can be brightly colored and bold or dull and secretive. Some are fearsome predators with large teeth and razor-sharp claws, while others are slow moving, docile plant eaters.

Most animals live in the ocean, which is where animals got their start. They occupy places from the wide open sea to the edges of the continents. The animals people relate to the most it seems, are the land animals. Although there are thousands of invertebrates (no backbone) living on land such as slugs, worms, spiders and insects, it is the larger vertebrates (with backbones) that usually catch our attention.

Vertebrates are all related to each other through a common ancestor dating back to over 500 million years ago. They are among the fastest and smartest of all species on Earth. Having bones allowed animals to get bigger and having a central nervous system allowed a larger brain to develop.

There are five major groups of vertebrates: fish, amphibians, reptiles, birds and mammals. Evolutionarily, the oldest group and the most abundant group, are fish. All fish have gills and live in water. Other than these common characteristics, they are a very diverse group. More recent groups of fish have two pairs of fins and scales. Fish include eels, lampreys, sharks and rays. In the King Range National Conservation Area (NCA), fish are an important component of the local ecology and economy.

Amphibians are unique in that they need water to lay their eggs and begin their life cycles, but commonly venture

onto land as adults. The largest group of amphibians includes frogs and toads. However, salamanders and newts are also members. In the moist woods of the King Range NCA and nearby forests, lives the Giant Coastal Salamander (formerly the Giant Pacific Salamander) which can reach 40 cm (14 inches) long.

Reptiles are the first group of animals to develop an egg that could survive outside of water, the amniotic egg. This allowed reptiles to spread out into previously unoccupied territories. As they ventured farther away from water, their skin developed **scales** which are hard little plates.

Local Connection

Whales of Northern California

Whales are fascinating creatures. They travel great distances, have complex social groups, and are highly intelligent. Some whales, like the humpback whale, even sing. Most whales spotted along the coast of California migrate long distances between their favorite feeding grounds and where they breed and give birth.

The best time to see whales is when the mothers have their babies with them in March and April, because they swim closer to shore. This is especially true of the most common whale, the gray whale. The whale watching seasons actually begins in December when they begin their journey south to warmer waters. Other whales that can be seen along the Northern California Coast include humpback whales, fin whales, blue whales, killer whales, and pacific white sided dolphins. Others?

Many people think of whales as fish, because they swim under water and live in the ocean, but whales are mammals. Whales, like other mammals must breathe air. When a whale exhales at the surface, a spout is seen. When people whale watch from a distance, a whale's spout is usually the first sign they see.

Back in the early to mid 1900's whaling was a big industry in the U.S. spanning all the way from southern California to Alaska. Millions of whales were killed for their precious meat and oils. Today most countries have banned whaling. However, some countries, like Japan and Iceland, still hunt them for their meat. Many organizations protect and monitor whales as they are truly magnificent beasts worth saving.

Scales have many benefits including protection from the sun. The Mesozoic era ranging from 65 to 150 millions years ago is often noted as the Age of the Reptiles. It was then that the Earth was truly occupied by some of the largest giants to roam the interior regions of the planet, the dinosaurs. Today, most reptiles are either snakes or lizards. One of the most feared snakes in the King Range NCA is the Western Rattlesnake. There are many species of rattlesnake and all of them have poisonous venom. Other local reptilian species include the Western fence lizard, the alligator lizard, the Western garter snake and the gopher snake. All reptiles are **cold blooded** (or ectothermic) like their distant cousins the amphibians. This means that they gain their heat from the environment. Because of this they are not active when it is cold outside.

Many scientists now conclude that birds are indeed direct descendants of the dinosaurs. Like mammals, they are **warm blooded** (or endothermic). They have to eat more food than cold blooded animals because they generate their own heat. All **birds** have **feathers**, which are special projections from their skin. There are different kinds of feathers. For instance, flight feathers are hollow and strong and allow birds to fly. Down feathers are the first to grow and help insulate birds.

Not all birds can fly. Penguins, ostriches, and rheas are all flightless birds living today. The majority of birds do fly, however, and because of this some make huge migrations between their breeding grounds and their feeding grounds. Humboldt Bay, north of the King Range NCA, is an important stop along the migration path of the Pacific Flyway. Millions of shorebirds stop along this area for the abundant food they can find on their way to and from their northerly breeding grounds. There are nearly 10,000 species of birds recognized today.

Mammals are another diverse group and include humans. The largest land animal living today is the African elephant and the largest animal to ever live on Earth is the blue whale, also a mammal. All mammals have hair or fur and produce milk to feed their young. Fur is a soft coat of hair. Hair mostly insulates and protects, but some hairs act as sensory devices like whiskers. Some mammals, like elephants and whales, don't have much hair. Other mammals have hair that has been modified into scales, like you can see on an armadillo, or quills, like the spines on a porcupine. Both offer a unique form of defense.

Some mammals are like their earlier cousins and have pouches. Animals with pouches are called marsupials. Most mammals develop their young inside a placenta. Mammals expend a great deal of care for their young; some for many years. Because of this, the emotional attachment between mother and offspring tends to be greater than that of other animals.

Local Fauna

In the King Range NCA, both marine mammals and land mammals play a huge role in the local ecosystem and attract tourists. Off the coast live healthy populations of seals, sea lions, whales and porpoises. In the surrounding land area, it is not uncommon to spot predators like foxes, coyotes and bobcats. Deer, bear, rabbit, squirrels and skunks are also common mammals here. Of course, the ever prolific rodents occupy a diverse range of habitats as well, including the dusky footed wood rat, the common porcupine, the Northern flying squirrel, and the deer mouse, to name a few.

Children of all ages seem to have a natural attraction to animals. A great way to introduce the scientific

concept of classification, is to group some of the more familiar ones like cats, owls and snakes. In the following activity, young students will classify three groups of vertebrates by the "coverings" that they have: fur, feather or scales. Mammals have fur, birds have feathers and reptiles have scales. All of these coverings are made of a protein called keratin.

Different coverings have different purposes. Animals can be easily damaged and body coverings provide protection and warmth. Colors and patterns help animals recognize their own kind and can act as camouflage or an invitation. No matter what the covering an animal has, learning about them is a great introduction into the various roles they have in our environment and the wonder of nature.

Activity 1: Classifying Animals (fur, feathers or scales)

Preparation

Cut up small pieces of fur, feathers, and “scales” and place them in containers. (Sequins and/or other craft supplies can be substituted for fake alligator vinyl). Once the activity begins, arrange the containers central to the students’ work area. Set up the microscope station with samples of different animal coverings.

Procedure

1. Begin a discussion about animals. Ask the students what they already know about animals and what they would like to learn further. Have handy a set of good pictures depicting a variety of exotic and local animals. These pictures can be digital or printed out. Read the book *Animals Should Definitely Not Wear Clothing*, by Judi Barrett after questioning.
2. Hold up another picture that shows a different type of covering (fur, feather, or scales) and continue to ask the students questions about the coverings they have. Feel free to see what they know about the different groups of animals. Ask them: “Why do you think certain animals have feathers and others have fur?”, for instance. (feathers allow birds to fly, scales allow reptiles to live where it is dry and hot, etc.)
3. Next, make three columns on a large piece of paper or the board. Label each column by the three types of coverings (fur, feather, and scales). Point to each word and have the whole class repeat it a couple of times. Together come up with the groups of animals that each covering belongs to (mammals, birds, and reptiles). Next to each heading, tape an example of the correct covering. Let the class help you. Explain to the students they will be grouping different

Materials

- pictures of different animals especially reptiles, birds, and mammals
- 4 x 4 cards of cut out pictures (see attached) Get local animal pictures
- classification pages (see attached)
- examples of feathers, fur and scales. (Fake fur, craft feathers and vinyl that looks like fake alligator skin are substitute for real ones)
- scissors and glue
- microscope set for student use
- prepared microscope slides (hair, scales, feather)
- book: *Animals Should Definitely Not Wear Clothing*, by Judi Barrett (optional)

animals based on the coverings that they wear. Model this by holding up a picture of an animal from each group, and together as a group, classify it under the proper heading by taping the picture in the proper column (This would work well on a felt board as well).

4. Pass out the set of sixteen pictures and have the students cut them out (Note: most won’t be able to read the names of the animals). As they cut them out, have them glue them under the proper heading on the classification page. (see attached) Walk around the room assisting where necessary. Once they are done classifying, they should take a sample of the correct “covering” and glue it next to the picture, or the heading, depending on the size of the group and the availability of samples. If another adult is available, have one or two students at the microscope station viewing coverings under magnification. One by one have the students come over to take a look.

5. After the students are done classifying the sixteen animals, review some basic concepts with them. Go over the basic vocabulary with them by explaining that reptiles have scales, birds have feathers and mammals have fur. Focus a little bit on any true samples of feathers, fur, and/or scales that you have brought in. Pass the samples around so they can touch them.

- *How are animals different than plants? (animals can move, animals need to eat)*
- *Do animals wear clothes?*
- *Do people wear clothes?*
- *Why do people wear clothes? (protection and warmth)*
- *What kind of coverings do different animals have?*
- *Hold up a picture of an animal and ask: “What covering does this animal have?”*
- *What purpose do you think this covering has for the animal?*

Activity 2: Designing an Animal and its Covering

Preparation

Have the assorted materials already cut up into small squares to lessen the amount of cutting needed by the students. Have scissors, glue and marking pens available.

Procedure

1. Explain to the students that they are going to make a “make believe” animal with whatever covering they want to give it. They should draw an outline of their animal first. For any older students, they should label what kind of animal it is and possibly make up a name for it. Hopefully, they can apply reasons why their animal has the covering it does based on where it lives and what it can do. For instance, feathers allow birds to fly and camouflage allows an animal to blend in with its environment.
2. Once the students have created an outline of an animal, they are to add what ever material and colors they want to it. The idea here is to be creative and apply some of the concepts learned in the previous activity.
3. If time allows, have them share their animal. They should explain where there animal lives and why it has the covering that it does. Place the finished products around the classroom, so that all can enjoy them.

Materials

- Samples of assorted material and craft supplies that can be used for animal coverings. Examples include, polka-dots, earthy colors, leopard patterns, fake fur, sequins, and feathers.
- scissors and glue
- drawing paper

Extensions

- Have the students create a bar graph using the numbers of animals under each classification.
- Take a field trip to the petting zoo at Sequoia Park Zoo in Eureka.
- Play charades using the animals that are found in the King Range NCA.
- Create a flip box labeled with different animal features such as slimy skin, scales, shells, and fur. Use it as a naming game.
- Find local resources that can bring live animals into the classroom for observation.
- Make a Venn diagram comparing two different animals like bears and humans.
- Have students cut out pictures of exotic animals and compare them to local ones.

References

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- Cook, Julie, Hislop Teresa, A Teacher's Guide to Fur, Feathers, and Scales Outreach and Discovery Lesson, the Academy of Natural Sciences, <http://www.uen.org/Lessonplan/preview.cgi?LPid=629>, Utah Education Network, 2002
- Ellis, Anne, Animals Undercover, <http://www.learnnc.org/>, 2005
- Hair, <http://animaldiversity.ummz.umich.edu/2010>
- Spalding, David A. E., Whales of the West Coast, Harbour Publishing, 2001
- Whale Watching at Pt. Reyes, http://www.nps.gov/pore/planyourvisit/wildlife_viewing_whales.htm, 2010

Name: _____

Date: _____

Match the animal pictures to the correct column below

Fur

Feathers

Scales

Fur	Feathers	Scales

Name: _____

Date: _____

Matching Activity

Cut-out the pictures below

