

Hands-On Minds-On Science Explorations
Grades 3-5

Animals



Hands-On Minds-On Publications

By Beth R. Davis, Ed. S., NBCT

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ANIMALS

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Name_____

Date_____

FOOD WEBS

- | | |
|----------------------|---|
| 1. _____ predator | A. A plant eater |
| 2. _____ carnivore | B. Animals captured and eaten by other animals |
| 3. _____ producer | C. An organism that eats the remains of recently dead organisms. Examples include vultures, raccoons, and buzzards. |
| 4. _____ herbivore | D. A meat eater |
| 5. _____ scavenger | E. Eats the remains of decomposing animals. When they are finished with the carcass, whatever remains returns to the soils and provides nutrients for the soil. (maggots) |
| 6. _____ food web | F. Plants do not eat, they produce their own food by using light energy. That energy is passed on to animals that eats the plants. |
| 7. _____ prey | G. A set of interconnected food chains |
| 8. _____ food chain | H. An animal who hunts for its food |
| 9. _____ omnivore | I. Sun→ plants → insects → rodents→snake→ owl |
| 10. _____ consumer | J. Animals eat or consume their food to get energy. |
| 11. _____ decomposer | K. An animal that eats both plants and meat |

12. In the example below, explain what would happen if the mouse population decreased. What affect would it have on the food chain?

Sun→ plants → insects → rodent→snake→ owl

Name _____ Date _____

Tell what you already know about marine mammals:

BLUBBER

Background Information: **Marine mammals** are mammals that spend their lives living in the water. Some examples include whales, dolphins, seals, walruses, and manatees. Most marine mammals have smooth rubbery skin that helps them to slip easily through the water. In order to keep warm, their body has a layer of blubber. **Blubber** is the thick layer of fat that the animals use to conserve body heat. Blubber can be six to twenty inches thick. If a mammal's food source is **scarce** (hard to find), it can live off of its blubber for a long time. Blubber is lighter than water, so it increases buoyancy in marine mammals and helps them to float. Hunters often kill marine mammals such as whales and seals and they heat their blubber to make oil.

Will marine mammals with blubber stay warmer than animals without blubber?

Problem Statement: Which fingers will stay warmer, the ones with the lard or the ones without?

Hypothesis:

Materials: lard, rubber glove, wooden stick, ice water

Procedure:

1. Place the glove on the hand that you do not write with.
2. Hold your hand out flat and spread the lard on the three middle fingers.
3. Hold the three middle fingers together.
4. Place the three middle fingers in the ice water for 15 seconds.
5. Remove the fingers with the lard from the ice water and place your thumb in the ice water for 15 seconds.
6. Remove your hand from the water. Immerse your entire hand in the ice water for 15 seconds. See if you can tell which fingers feel warmer in the ice water.

Results: Which fingers stayed warmer, the ones with the lard or the ones without?

--

Conclusion: Was your hypothesis supported? Tell why or why not.

Choose **one** of the following and respond:

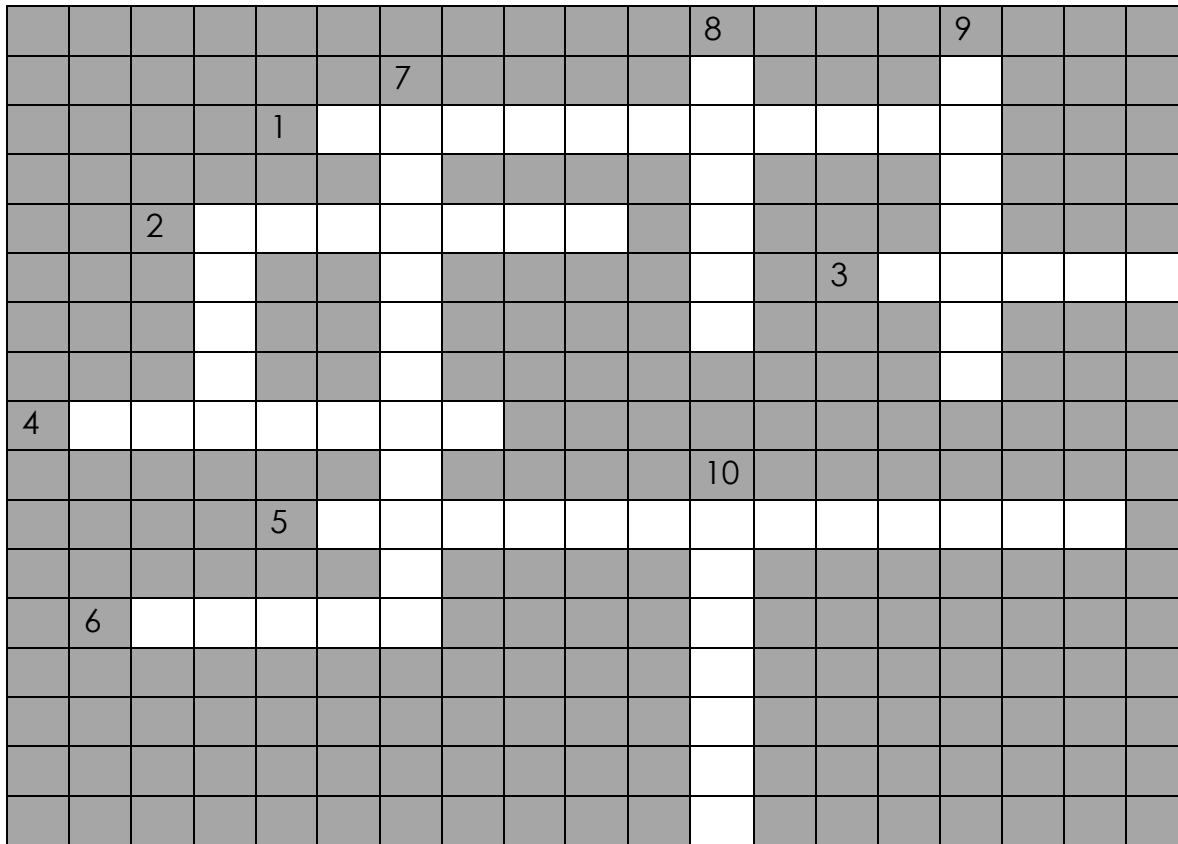
Many marine mammals are being hunted and killed for their blubber. The blubber is used to make oil, crayons, cosmetics, glue, and soap. Tell what you think can be done to keep marine mammals from being hunted for their blubber. Give possible solutions for this problem.

Pretend that you are a whale. Tell about how you might feel knowing that hunters wanted to hunt you and use your blubber to make things for their own use. Be sure to tell about your family, where you live, what you look like, and some of the things you like to do. What would you do to stop the hunters?

[illegible]

NAME _____ DATE _____

Exploring Invertebrates
Show what you know



Across

1. Invertebrates do not have the ability to control their body _____.
2. Temperature around invertebrates is too cool or too warm, they cannot _____.
3. The larval stage lasts 2-3 _____.
4. The mealworm sheds its skin, also known as _____ before it begins the pupa stage.
5. Many insects go through four stages of growth in their lives called _____.
6. The stages are the egg, larva, pupa, and _____.

Down

2. After hatching, the mealworms begin to eat grains and become too large for their hard _____.
7. The existence of invertebrates is dependant on the temperature of their _____.
8. Mealworms are the _____ stage of grain beetles.
9. Most invertebrates prefer a temperature between 60 and 90 _____ F.
10. Mealworms are scavengers who like to eat _____ grains, cereal, or feathers and bodies of other dead animals.

NAME _____ DATE _____

EXPLORING INVERTEBRATES: MEALWORMS

Background Information: Temperature is a very important aspect of an invertebrate's environment. Invertebrates do not have the ability to control their body temperatures. As a result, their existence is dependant on the temperature of their environment and their surroundings. If the temperature around them is too cool or too warm, they cannot survive. Most invertebrates prefer a temperature between 60 and 90 degrees F. Many insects go through four stages of growth in their lives called metamorphosis. The stages are the egg, larva, pupa, and adult. Mealworms are the larval stage of grain beetles. The life cycle begins with a white oval shaped egg that is about 1mm long. After hatching, the mealworms begin to eat grains and soon become too large for their hard shell. The larval stage lasts 2-3 weeks. The mealworm sheds its skin, also known as molting before it begins the pupa stage. The pupa stage lasts for 1 to 3 weeks, during which time, the mealworm is transformed into an adult beetle. The adult beetle lives only a few months and, in that short time, a female can lay 500 eggs. Mealworms are found in dark, damp places. They are scavengers who like to eat rotting grains, cereal, or feathers and bodies of other, dead animals.

Problem Statement: What temperature do mealworms prefer? hot, cold, room temperature?

Hypothesis:

Procedure:

1. Line up three ziplock plastic bags with hot, room temperature, and cold water on the table.
2. Make a foil bridge and lay it across the three bags.
3. Carefully pour the three mealworms on the bridge.
4. In two minute intervals, record a tally mark for each mealworm to show where they are on the foil bridge.

Data:

Time	Hot	Room Temp.	Cold
2 minutes			
4 minutes			
6 minutes			
Total:			

Results: At the end of 6 minutes, count the tally marks to see which temperature had the most.

Conclusion: Was your hypothesis supported? Explain why or why not.

FOOD CHAIN GAME DIRECTIONS

1. Explain to students that we get energy from the food we eat. All living things we eat get energy from the sun. The sun gives energy to plants. When insects eat the plants, they get the energy the plants got from the sun. When larger animals eat smaller ones, they get the energy from what they eat.
2. Humans get energy indirectly from the sun when we eat plants or animals that got their energy from the sun. For example, grass gets energy from the sun. A cow eats the grass and gives the cow energy. We eat hamburger (cow) and get the energy from the grass the cow ate. It is like an energy chain.
3. Explain that in a food chain, animals survive by eating others. Plants are on the bottom of the food chain. We need a lot of plants to feed all the many things that eat them, like insects or other plant eaters.
4. Choose half of the group to be grasshoppers, two or three to be hawk, and the rest to be mice. Spread out the colored paper bits on the ground, that will be the grass. Give each grasshopper a bag to be their stomach. When you tell them to, they will "eat" by picking up all the bits of paper and putting them into their "stomach" (bag). Hawks and mice watch.
5. Next, the mice will "eat" the grasshoppers. On your command, mice will "eat" the grasshoppers for 10-15 seconds. Go over rules for "eating". For a mouse to eat a grasshopper, the mouse uses ONE FINGER to tap the grasshopper on the shoulder. When they are tapped, the mouse says "Thank you" and the grasshopper freezes and hands over their stomach bag.
6. Next the hawk can eat whoever is left in the same manner. Give them only 15 seconds to eat.
7. When the game is over, explain that if they got eaten, they died. Those who did not get eaten are losers as well. Explain that one of the colors in their bag is grass, the other color is pesticides. Pesticides are poisons to keep pests from eating our plants. The grasshoppers who are still alive will see that they have pesticides in their bag. They will die. The mice who ate grasshoppers also ate the pesticides, so they die too. The hawks ate the mice and grasshoppers. They will not die, but their eggs will be so brittle that their babies will die. In the end, everyone loses.

NAME _____ DATE _____

FOOD WEBS

A Food Web, is a set of interconnected food chains by which energy and materials circulate within an ecosystem. One type of food web is a grazing web. In a grazing web, materials pass from plants to plant eaters (**herbivores**) to flesh eaters (**carnivores**).

Food Chain

Grass -----> grasshopper ----- > mouse ----- > hawk

In the food chain game, what animal ate the grass? _____

What ate the grasshopper? _____

What ate the mouse? _____

What animal was the highest on the food chain? _____

What animal was the lowest? _____

What is a herbivore? _____

What is a carnivore? _____

Tell why the hawks were unable to have healthy babies.

What animal were you in the game? Tell what happened to you.

What is meant by the saying, "In this game, nobody wins,"

Tell the advantages and disadvantages of pesticides.

HOMework

For homework, tell how the food chain game was played as well as the outcome. Tell what you learned about food webs.

[illegible]

NAME _____ DATE _____

OBSERVING MEALWORMS

Background Information: Mealworms have a 4-stage life cycle. They begin as tiny eggs that we can't see. The second stage is the larva or mealworm stage. Next they begin their metamorphosis and become a sleepy pupa. In the adult stage, they become a black beetle. Mealworms can be found in dark and damp places. They are scavengers and like to eat rotting grain and cereal.

Use your hand lens to get a closer look at your mealworm. Look for eyes, legs, mouthparts, and hair.	Draw your mealworm here:
My mealworm's name is _____	My mealworm is _____ millimeters long.

Gently blow on the mealworm and write a sentence telling how it responded.

--

Tap on the table next to the mealworm. Did it walk away or stay near the tapping sound?

--

What senses did you use to observe your mealworm?

Name the four stages that a mealworm goes through.

1. _____ 2. _____ 3. _____ 4. _____

Observing Mealworms

Think of 5 things that are longer than your mealworm and write them here:	Think of 5 things that are shorter than your mealworm and write them here:

Write About it: There are thousands of different insects living on our planet. Think about your favorite insect. Explain why it is your favorite.

Math Connection:

If 23 mealworms turned into beetles on Monday and 45 turned into beetles on Tuesday, how many beetles were there in all?

If one mealworm laid 165 eggs and another mealworm laid 288 eggs, how many more eggs did the second mealworm lay?

NAME: _____ DATE: _____

Tell what you already know about worms:

REFLEXES IN WORMS

Background Information: Invertebrates are animals without backbones. There are four main categories. They are **echinoderms**, **mollusks**, **arthropods**, and **ringed worms**. Ringed worms are cold-blooded animals that have soft body sections. Earthworms are one type of ringed worm. They are often called nature's plowman because they live in the ground and tunnel their way through the ground, mixing up the layers of soil. Earthworms eat decayed leaves and plant material. They also swallow bits of soil and animal material. Earthworms have two sets of muscles. Circular muscles are around each segment of the worm. Long muscles run the length of an earthworm's body. Earthworms help the earth by mixing up the soil layers, adding nutrients to the soil by depositing their waste, and by helping decompose dead plant and animal materials. Earthworms are sensitive to many things that pollute soil and water. Many soaps, acids, and wastes are dumped into the soil and they poison earthworms and the birds that eat them. You can test an earthworm to see if they will respond to stimuli (different conditions in the environment).

Problem Statement 1: How will an earthworm respond to sound? How will it respond when touched by water?

Hypothesis:

Problem Statement 2: What environments will the earthworm prefer? Wet or Dry, Rough or Smooth, Light or Dark

Hypothesis: Record your prediction on the table on the back of the lab report.

Materials: earthworms, hand lenses, water, dropper, notebook paper, sandpaper, paper towel, flashlight, and black paper

Procedure 1:

1. Tap on the table both at the front and back end of the earthworm. Record how it responded.
2. Drop one drop of water on the earthworm and record how it responded.

Earthworm observations: Use complete sentences.

Procedure 2:

1. Place a wet paper towel and a dry one side by side. Place the earthworm in the middle of the two surfaces. Record which surface the worm preferred.
2. Place a piece of sand paper and a piece of notebook paper side by side. Place the earthworm in the middle of the two surfaces. Which one did it prefer?
3. Fold a piece of black paper and place it next to the worm. Shine a flashlight on the worm and record if it prefers to stay in the light or in the dark.

RESULTS TABLE

What environment will your worm prefer?	Your hypothesis	What environment did your worm prefer?	Was your hypothesis correct?
Wet or dry			
Smooth or rough			
Dark or light			
Total correct			

Results: Summarize your results using the table.

Conclusion: Tell which items supported your hypotheses.

EARTHWORM LAB QUIZ:

1. Cold-blooded animals with soft body sections are called _____.
2. List the four main types of invertebrates: _____.
3. Earthworms have two sets of muscles called _____ and _____.
4. Tell three ways earthworms help the soil.
5. Why are earthworms called nature's plowman?

Define your vocabulary here: Any words in *italic* must be looked up in a dictionary.

Invertebrates:

<i>Echinoderms:</i>

<i>Mollusks:</i>

<i>Arthropods:</i>

Ringed worms:

Stimuli:

Name _____ Date _____

Classification Systems

Scientists classify things into groups so that it is easier for them to observe what they are studying. Zoologists are scientists who know a lot about animals. Botanists know a lot about plants, and marine biologists know a lot about marine life. They are experts in their fields. Things are classified by how they are alike or different. An **attribute** is a way of describing something. It can be how it looks, the size, shape, color, how it feels, or other characteristics.

Look at your partner and write down three ways that you are alike or different.

Person #1: Name-	Person #2: Name-
Attributes	Attributes
1.	1.
2.	2.
3.	3
4.	4.
5.	5.

Pour all the buttons in your bag on the table.

Attribute	How many?	Attribute	How many?
Two hole		Four hole	

How many buttons had two holes? _____

How many buttons had four holes? _____

How many buttons were there in all? _____

Make a **pictograph** to show how many buttons had two holes and how many had four holes.

[illegible]

Look at the buttons on your table. Sort them four ways. Once they are sorted, count how many are in each pile and record the numbers in the table below.

1.		2.	
1.		2.	

Total: _____

Total: _____

3.		4.	
3.		4.	

Total: _____

Total: _____

Using the data from the table, write a summary of your buttons.

I had _____ buttons in all. There were _____ buttons with two holes and _____ buttons with four holes.

Animals can be sorted into different categories. Here are some ways animals can be sorted by their attributes.

<u>Animals</u>	
<u>Vertebrates</u>	<u>Invertebrates</u>
Mammals: humans, dogs, rabbits, lions, cats, whales, bears	Mollusks: clams, oysters, snails, octopuses, squid
Birds: eagles, turkeys, sparrows	Echinoderms: sea star, sea urchin, sand dollar
Fish: trout, bass, eels	Annelids: earthworms, clamworms, leeches
Reptiles: turtles, dinosaurs, snakes, lizards, alligators	Arthropods: spiders, insects, crabs, lobsters
Amphibians: frogs, toads, salamanders, skinks	

Tell something you learned today that you did not already know:

NAME _____ DATE _____

CLASSIFICATION SYSTEMS

Scientists use **classification systems** to make it easier to study branches of science. By dividing objects into groups, scientists become experts in their fields. An **attribute** is a characteristic used to group things.

ITEM BEING SORTED: _____

Name the different ways you can sort the item into two groups (Attributes).

Write the name of the items you are sorting. Sort the item by an attribute into two groups. Then count how many in each group and record the data on the data table.

Item being sorted:

Attribute	# in the group	Attribute	# in the group

Fill in the graph using the data on the table:

Graph Title

Number of items	30											
	29											
	28											
	27											
	26											
	25											
	24											
	23											
	22											
	21											
	20											
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	6											
	5											
	4											
	3											
	2											
	1											
	0											

ATTRIBUTE