

Let's Get Crabby



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Program Outline and Overview

List of Grade Level(s): I used this program with third graders, but it could be used as is with fourth graders and, with some modifications, by second graders.

Students: There were five third grade classes of 28 students each that participated in this program. The range is from above grade level to well below grade level. The students have no extensive technical background and each class meets once a week for 45 minutes. The classes normally meet in their classroom, but for the culminating lesson they met in our school's media center. The program can easily be adapted to other ages and achievement levels by modifying the quest and lab sheets or using only some sheets. If classes share the live animals this could be used by more than one class, consecutively but not concurrently. This program meets the needs of all learners in the classroom because it is multi-sensory and the tasks can be modified so as to be challenging to those that need the challenge and doable by those whose skills are below grade level.

Major Goals and Overview: The instructional purpose of this program is to meet Life Science Concept Standards while studying invertebrates, namely:

- S2a. Demonstrates understanding of characteristics of organisms.
- S2c. Demonstrates understanding of organisms and environments.
- S5a. Asks questions about natural phenomena, objects and organisms, events and discoveries
- S5f. Works individually and in teams to collect and share information and ideas.
- S6a. Uses technology and tools to gather data and extend the senses.
- S6c. Acquires information from multiple sources, such as experimentation and print and non-print sources.
- S8b. Demonstrates scientific competence by completing a systematic observation.



- with a backbone and animals without a backbone. The scientific terms for these categories are vertebrate and invertebrate. Have children feel their vertebrae. Review that the prefix “in” can mean not.
8. Because I am limited with time, I pre-cut animal pictures and laminated them. This also insured that I had an equal representation of vertebrates and invertebrates and could use them over again. However, you could have students cut their own pictures from magazines or assign it as a homework assignment. Have these pictures classified into vertebrate and invertebrate.
 9. For a quick assessment and review ask the students how would they classify the following animals: Earthworm? Lobster? Crocodile? Turtle? Etc.



Lesson II: What are the characteristics of worms?

Aim: To demonstrate an understanding of the characteristics of a red wiggler worm.

Materials: Red Wigglers (see resources) Trays
Earthworms are Animals Magnifiers
Cotton swabs Rulers
Water Paper towels
Vinegar
Worksheet (see worksheet section)

Procedure:

1. Review concepts of vertebrates and invertebrates. What do you think a worm is?
2. Read *Earthworms are Animals* (See Bibliography).
3. Explain the importance of respecting all life before distributing worms. Give each child a tray, magnifier, worm, and worksheet.
4. Allow time for free exploration and comments.
5. Complete worksheet and distribute rulers, wet/dry paper towels, and vinegar-soaked cotton swabs as needed.

Further Activities: (If you wish to extend the lesson)

1. Put some soil in two clear-plastic or glass containers. Pack it so that the surface is hard. Then use a pipe cleaner or straw to make tunnels in one container. Pour a cup of water over each container. What do you see? How does this show that worms are helpful to farmers?
2. Write a story about the dangers of a sunny day from the point of view of a worm.
3. Earthworms slide and wiggle through the soil, that's how the red wigglers get their name. Talk with the class about the way other animals move. Make a chart listing the different animals and the different ways they move.



Lesson III: What is a mollusk?

Aim: To identify the characteristics of mollusks.
To identify the structures that can be seen on a clam.

Materials: Shells
Trays
Preserved Clam
Paper Towels
Magnifiers
Toothpicks
Can of baby clams
Work sheet

Procedure:

1. Read *Mollusks Are Animals*.
- Mollusks are invertebrates but most have a shell.

Background Information:

There are over 100,000 species of mollusks. They live in sand; under rock and seaweed; in coral, shallow/deep water, bushes, trees, and gardens. The shell is made of calcium carbonate--the same substance that makes up chalk. They furnish us with pearls, buttons, ornaments, and food. Most shells washed up on our shores are in the mollusk group. Mollusks are divided into three groups: BIVALVES have two shells such as oysters, clams, scallops, and mussels. They filter food by driving water over their net-like gills. There is a muscle that holds the shell together. They move by a muscular "foot" which is thrust forward. GASTROPODS have one shell (univalve) that is spiraled, such as snails, periwinkles, whelks, and abalone. They have a distinct head with eyes and feelers. CEPHALOPODS have an internal cuttlebone made of cartilage and have tentacles for defense. They include the squid and octopus and can protect themselves further with ink, changes in color, and rapid movements.

3. Distribute trays and a handful of shells to each child or small group. Have them describe properties. How can we divide shells? Listen to suggestions and divide shells accordingly. If no one offers univalves/bivalves, the teacher should provide it.

4. Collect shells and distribute paper towels.

5. Look at a preserved clam and identify its parts. (This step can be eliminated without any problem if you don't have a preserved clam.)

6. Distribute clams, toothpicks, magnifiers, and worksheets. There are enough clams in a can for each child to get his/her own. You should be able to identify the stomach, muscle bundles, foot, siphons, and gills.

Further Activities:

1. Some mollusks filter their food. Mix some sand in some water. Use a filter from a coffee maker and hold it over a pail. Pour the water through the filter. How is this like the way some mollusks get their food?
2. Octopi and squids move when they squirt water out of their bodies. Blow up a balloon and see what it does when you let it go. How is the motion of the balloon like that of the octopus or squid? (Need I say, the children love this?!)



3. Slugs like dark, damp places. Pretend you are a slug hidden under a rock. What would it be like to slide along on slippery slime? What exciting things might happen to a slug? Write a poem or story about being a slug,

Lesson IV: What are the characteristics of insects?

Aim: What is an insect?

What are the characteristics of a cricket?

Materials: “Microscopes” and “slides.” These are basically Viewmasters shaped like microscopes and the slides are film. Animal nature books can provide you with pictures of insect body parts as well.

Small containers

Crickets

Worksheets

Procedure:

1. Review what has been learned about invertebrates to date.
2. Today we are going to talk about insects that have an exoskeleton that is made from chitin. Insects are the largest group of animals and they live in every part of the world.
3. Read *Insects are Animals*.
4. The slides on the microscope show different types of legs and what each kind does, different types of mouths (you may want to bring in a party blower to demonstrate the mouth of a butterfly), the wings, airholes, and antennae. The children should learn that the insect has three body parts (head, abdomen, and thorax), six legs, and two antennae. (Wings are optional.)
5. Now distribute crickets in their small containers. Emphasize that the children are not to open the containers, as the insects will jump. After some exploration and sharing, distribute worksheet. Please note the diagram is of a grasshopper and not a cricket, but the basic parts are the same. You may want to have those students with female crickets draw the ovipositor (the long black structure at the hind of the animal) on their worksheet and label it as well.

Further activities:

Later on in the year, the students raised milkweed bugs from eggs to adults. They loved it.



SAMPLE WORKSHEETS



Name _____ Date _____

PROBLEM: What are the characteristics (properties) of a worm?

MATERIALS: 1. Cotton swab 4. Water
 2. Ruler 5. Paper towel
 3. Vinegar 6. Worm

PROCEDURE: Answer the following questions as you examine your specimen

OBSERVATIONS:

1. What is the basic shape of a worm? _____
2. Does a worm have arms or legs? _____
3. Does a worm have a mouth? _____
4. Does a worm have eyes? _____
5. Measure the length in centimeters. _____ cm
6. Describe its color _____
7. Describe its texture _____
8. Is the head segmented? _____ Is the tail segmented? _____
9. Use the information to your answers for questions 1-8 to draw a scientific sketch of your worm.

10. What does a worm do when it meets an object in its path?

11. Does the worm prefer a dry or wet surface? What did you observe?

12. Does the worm react to noise? What did you observe?

13. Does the worm react to vinegar? What did you observe?

CONCLUSIONS:





Name _____

Class _____

PROBLEM -

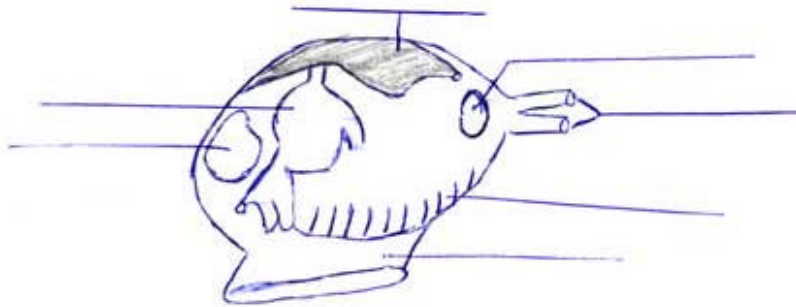
What structures can be seen on a clam?

MATERIALS -

1. Magnifier
2. toothpicks
3. clam

PROCEDURE -

Following the diagram below, locate each organ and give its function on the table below.



OBSERVATIONS -

STRUCTURE	FUNCTION
Muscle bundles	
Foot	
gill	
Siphons	

NOTE:

TOUCH THE FOOT AND MUSCLE BUNDLES WITH YOUR TOOTHPICK, NOTE THEIR FIRMNESS. THESE TWO MUSCLES DO A LOT OF WORK AND MUST BE STRONG.

CONCLUSION -

Structures I saw in the clam were: _____



Name _____ Date _____

PROBLEM: What are the characteristics (properties) of a cricket?

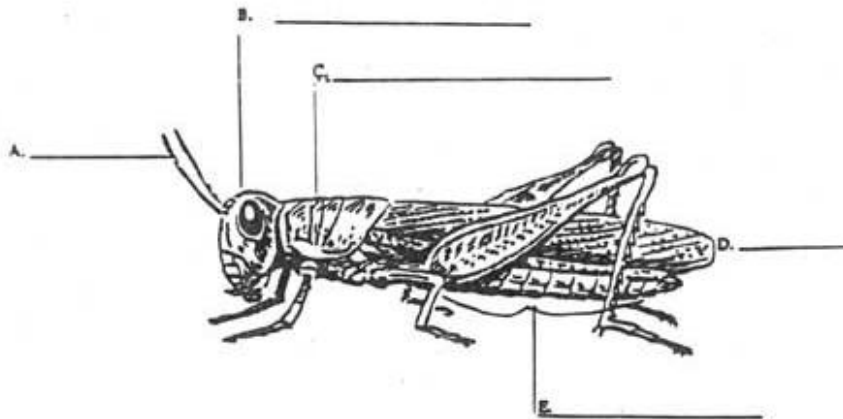
MATERIALS: 1. Crickets
2. Ruler
3. Small containers

PROCEDURE: Answer the following questions as you examine your specimen

OBSERVATIONS:

1. How many legs does the cricket have? _____
2. Are the legs all the same size? _____
Which are different? _____
How are they different? _____
3. Does the cricket have a mouth? _____
4. Describe the eyes of the cricket _____
5. Measure the length in centimeters _____ cm
6. Describe its color _____
Why do you think it is that color? _____
7. Is the body segmented? _____
How many parts is it segmented into? _____
Which part is the largest? _____

Label the cricket





CRAB/MILLIPEDE WORKSHEET—Page One

Name _____ Class _____

Aim: To compare arthropods

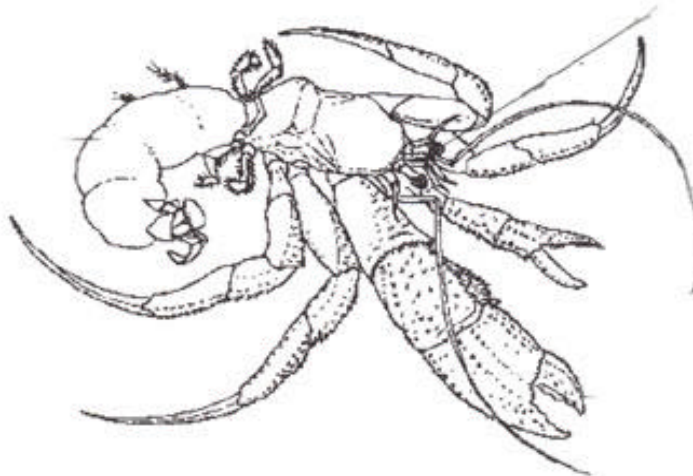
Procedure: 1. Observe the millipede and the hermit crab
2. Try to identify the parts of each one
3. Answer the questions in the data table



MILLIPEDE 1. Does it have an exoskeleton? _____
2. Does it have antennae?
Draw one

3. Does it have a segmented body? _____
4. How many legs does it have on each segment? ____
5. How many body parts does it have? _____

HERMIT CRAB 1. Does it have an exoskeleton? _____
2. How many legs does it have? _____
3. Does it have antennae? _____
4. Does it have a segmented body? _____
5. How many body parts does it have? _____
LABEL the picture





CRAB/MILLIPEDE WORKSHEET—Page Two

Name _____ Class _____

Go to www.Galexo.com/crabs

1. Click on the first crab. Look at the 12 crabs and pick one you'd like to know more about. Click on it.

What is its name? _____

Click on more information.

List one distinguishing characteristic. _____

Where can it be found? _____

2. Click on the second crab.

Find out what a hermit crab likes to eat.

List another fact you learned.

3. Click on the third crab. Find a picture. In your own words, describe what it's about.

4. Click on the fourth crab. Is there a word you're not sure of and need to look up?
_____ **If yes, write it down here** _____

5. Click on the last crab. Take the quiz. How long can a hermit crab live?

How do crabs breathe? _____

6. Revisit the site on your own and write down anything that you find interesting.



Resources

The following two places are good sources for all the equipment you will need to do the experiments outlined here.

CAROLINA BIOLOGICAL

<https://www3.carolina.com/onlinecatalog>

They offer a preserved clam, crickets, and land hermit crabs, to name a few of the items.

DELTA EDUCATIONAL

<http://www.delta-ed.com/>

Delta offers a cricket habitat, worms and a worm kit, trays, and bags of assorted buttons.

I found my local pet shop to be a good supplier as well. Places like Petco or Pet Smart sell crickets, worms, and hermit crabs. You may also be able to obtain compost worms from an area botanic garden that often makes them available for school groups. So you can in essence do two projects—examine the worms and then see how they compost organic matter. (It doesn't smell.)



Bibliography

Invertebrates

Jellyfish to Insects by William Hemsley

Interesting Invertebrates by Elaine Landau

The Inside –out Stomach: An Introduction to Animals Without Backbones by Peter Loewer

Worms

Earthworms Are Animals by Judith Holloway and Clive Harper

No Bones: A Key to Bugs and Slugs, Worms and Ticks, Spiders and Centipedes and Other Creepy Crawlers by Elizabeth Shepherd

Clams and Shells

The Shell Book by Barbara Hirsch Lember

Shells are Skeletons by Joan Berg Victor (good picture of the inside of a clam)

Little Clam by Lynn Reiser

Insects/Crickets

The Very Quiet Cricket by Eric Carle

Insectlopedia by Douglas Florian (very original and funny poems)

The Big Bug Book by Margery Faddam (bugs drawn to scale)

Hermit Crabs

A House for Hermit Crab by Eric Carle

Hermit Crabs by Sylvia A. Johnson

Hermit Crab Lives in a Shell by William M. Stephens

Creating an Internet Site

Dreamweaver 4 Fireworks4 Visual JumpStart by Ethan Watrall