

Spineless Wonders Classroom Activities

PRE VISIT ACTIVITIES

These classroom activities will help prepare your students for the upcoming Aquarium visit.

1. CLASS OF ITS OWN

Have your class choose several local seashore creatures and create a list of their characteristics. They can then use these to classify these animals and sort them into different groups. Compare these categories to the phyla, classes and species your students learned about in the Aquarium's Wet Lab classroom. Are they different?

Objectives

- classify and order based on a set of keys and criteria
- differentiate between relevant and irrelevant information
- demonstrate a willingness to interact with others in a variety of classroom and school activities involving communication
- evaluate conclusions in relation to other evidence and sources

Materials

- pencil
- paper
- photographs or drawings of several marine creatures

Steps

1. Have your students classify aquatic creatures into different categories based on their characteristics and behaviours, or any criteria your students want to use.
2. Compare your students' classification systems with the scientific classification system. See the *Background Information* section to review which animals are found in what phyla. Use the *Animal Names and Scientific Classification* section to help you explain how scientists classify organisms.
3. How and why are your students classification systems different from the scientists' system? Remind your class that there is no right or wrong way to classify animals, but there are many different ways to do it.

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POST VISIT ACTIVITIES

These classroom activities will help reinforce themes introduced during your Aquarium visit.

1. HOW ENVIRONMENTALLY FRIENDLY IS IT?

Are the advertisers telling the truth about “environmentally friendly” household-cleaning products? Many of the cleaning products we use to clean our homes are pollutants. Experiment and find out if there are any differences between the effects of some common glass cleaners, dish detergents, bleaches and their supposedly environmentally friendly alternatives.

Objectives

- correctly state a hypothesis and evaluate conclusions in relation to other evidence and sources
- draw reasonable conclusions from experiments
- use instruments to make a variety of direct measurements
- demonstrate the appropriate use of microscopes
- learn to write up the results of an experiment

Materials

- salt water
- stream water
- 3 containers larger than 4 litres in size
- thermometer
- sunny window
- microscopes (optional)
- phosphate detergent
- household cleaning products

Steps

To compare phosphate and “environmentally friendly” products such as bleaches, glass cleaners or dish detergents:

1. Collect a large water sample from a body of water near you—lake, stream, river or ocean.
2. Label each of the three containers: control, phosphate detergent, and non-phosphate detergent.
3. Fill these three equal-sized containers with the water you collected. Keep the remainder of this water in a dark cupboard. You will need it throughout the experiment.
4. Each day, have a student record the temperature and general appearance of each container and add 1 ml of household phosphate detergent to the “phosphate detergent” container, 1 ml of nonphosphate detergent to the “non-phosphate detergent” container. Keep a record of daily changes in each container. To compensate for evaporation, top up all three containers with the water you stored in a dark place.

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5. Have your class make a hypothesis about what will happen to the water in each container. Will it change or stay the same? If it changes, how will it change?
6. Place all three of these containers in a sunny window.
7. Repeat Step 4 for two weeks, or until there is a marked difference in appearance among the liquids in the containers.
8. If you have microscopes in your class, take samples of water from all three containers and view them under medium magnification. Have each student write a brief lab report addressing the following questions:
 - Do the liquids in the containers change in appearance during the experiment?
 - Did the “environmentally friendly” phosphate-free product have a different affect from the phosphate-based detergents?
 - Can you think of any improvements you could make to this experiment?
 - Which products do you think would present a problem for our lakes, streams, rivers and oceans?

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2. BEACH IN A BAG

Students create a mini-intertidal zone in a zip-loc bag. Their intertidal zones include elements of the different zones, and the animals that live in them.

Objectives

- be able to define the intertidal habitat
- learn what elements a habitat must contain for animals to survive
- describe ways in which species interact with each other
- reinforce basic conservation concepts learned during your Aquarium visit

Materials

- sandwich-sized zip-loc bags, 1 per student
- permanent marking pens
- write-on transparency films
- blue hairstyling gel—about 100 grams per student
- pictures to trace or copy
- scissors

Steps

1. Create an intertidal zone, complete with rising and falling tides! First, talk with your students about the intertidal zones and the animals and plants that live in this habitat. Use the *Teacher's Information* section as a resource.
2. Have each student think about the plants or animals they want to live in their zip-loc intertidal seashores.
3. Now have the students use permanent marking pens to draw the substrate (sands, rocks, gravel, caves, etc. or some combination of these) on one side of the zip-loc bag. On the other side of the bag have them draw seaweeds.
4. Use transparency film to design, colour and cut out an assortment of marine animals. Make the animals small so they will be more-or-less in scale with the entire intertidal zone in the bag. Tip: Before cutting the animals out, use fine point pens to outline them in black, so they can be seen more easily when they are awash in the blue gel.
5. Fill the zip-loc bags about half-full to a thickness of about 2.5 cm with the blue hair gel. This will give an illusion of three dimensional depth. Now you have a tiny intertidal zone. Have each student drop their animals into their zip-loc bags and seal them.
6. Discuss the variation in animals and habitats your students created. What elements do these habitats have in common? What do animals need to survive in the intertidal zone?(food, oxygen, protection)



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3. Be a Beach Walker!

Plan a walk at the beach or along a river, lake or pond for your class after your Marine Mammals and Their World School Program. Then have your students write a short story about their discoveries.

Objectives

- Reinforce basic aquatic conservation concepts learned during your Aquarium visit
- Introduce basic habitat care practices
- Teach observational skills
- Relate information from other sources
- Explore a natural habitat, and learn about the lives of aquatic animals and plants

Materials

- First aid kit
- Rubber boots
- Extra set of dry clothes
- Clipboards and waterproof paper
- Magnifying glasses
- Pencils
- Buckets
- Bag to collect any garbage
- Guide Books



Procedure

Pre-Visit Activity:

Before you take your class for a beach walk have your students explain how they can care for pets at home and what type of care marine plants and animals might require. This activity can create an awareness of the need to respect all living creatures, including unfamiliar marine plants and animals.

When:

A couple of hours before low tide is the best time to begin your visit to the shore. You can find information on tides online at <http://tides-marees.gc.ca>. Remember to remind students to respect all animals they find when visiting the beach.

Post-Visit Activity:

Discuss where the animals live at the beach and how the wind and water affect these habitats. Talk with your students about how visitors should behave at the beach. Have your students write a story with pictures describing how the animals they saw live in the water, on the beach, between the rocks and in the sand.

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4. Watching my Waste-Line

In this activity, students will record how much daily waste is produced in the classroom and work towards reducing their impact on the environment.

Overview of Activity:

1. After lunch, empty the garbage can in the classroom, and make a list of the types of garbage (e.g. plastics, juice box, paper, food, etc.) and the amounts of each type of garbage. Chart and total this amount.
2. Discuss where the garbage will go (to the dump? to a landfill?) and how garbage can affect the environment. Ideas that should come up include:
 - Animals eat it and get sick
 - Animals get caught in it and die
 - Chemicals get into the environment
 - It takes up space and habitat
3. Look at your immediate area, too. Are there enough garbage bins in the schoolyard? How does the garbage get removed? Is the movement of the garbage a source of pollution that needs attention? Does schoolyard garbage get into local streams?
4. Discuss how we can reduce the waste we produce. Ideas might include:
 - Recycle material
 - Reuse plastic bags (or use cloth bags)
 - Buy items with less packaging
 - Use reusable containers
5. Take out any recyclable material (paper, cans, juice boxes, etc.) and arrange to have them recycled. Total the remaining amount of waste. Compare this to the original amount. How much waste could have been reduced?
6. Challenge the class (or the entire school) to reduce their waste by having a Litterless Lunch (see following lesson plan). Check every week and chart their progress. Make a sign that shows the amount of waste that has been reduced. For example, "Since September 6th, we've reduced our waste by 42%!!"
7. As an extension, consider looking at the community as a whole and methods to reduce waste as a community. How can students encourage the community to reduce waste, reuse and recycle?

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5. Litterless Lunch

Parents often pack lunches with disposable plastic bags, aluminum foil, or wax paper, or they purchase single-serving items, such as fruit cups or juice boxes. Much of the trash we generate comes from food packaging, and lunch foods are no exception.

In fact, it is estimated that on average a school-age child using a disposable lunch generates 67 pounds of waste per school year (www.wastefreelunches.org). An old-fashioned "brown bagger" can conceivably dispose of over 14, 000 paper lunch bags in their lifetime (www.saveonfoods.com).

A litter-less lunch is one where nothing needs to be thrown away. For example, a student could pack a lunch in a reusable lunch box or cloth bag with re-usable plastic containers.

Activity

1. Eat lunch in the classroom on a rainy day, and ask students to measure the amount of waste.
2. Discuss what it means to create a lunch with no waste. Why is it important?
3. Brainstorm with the class what a litterless lunch looks like?

Avoid:

- × Brown paper bags
- × Plastic sandwich bags
- × Disposable single servings
- × Styrofoam cups
- × Individually packaged snacks

Instead choose:

- ✓ Reusable lunch kits or bags
 - ✓ Reusable plastic containers: Divide a larger batch of snacks or a large container of yogurt into your own single servings.
 - ✓ Reusable drink bottles: Buy larger sizes or concentrated forms of beverages and dispense them into your own refillable thermos or drink container.
 - ✓ Snacks in minimal wrapping
 - ✓ Recycling: Return your deposit container at a redemption centre. Place your clean metal, rigid plastic, plastic bags, paper, and cardboard in the blue bins at Recycling Depots around the region.
 - ✓ Pack a cloth napkin instead of a paper napkin.
 - ✓ Pack stainless-steel utensils instead of using disposable plastics.
 - ✓ Compost your fruit and vegetable scraps. Take them home or consider setting up a worm composting bin at school.
4. Select a day to have a litterless lunch in the classroom. Send a letter home informing parents about the day and possible lunch alternatives.
 5. Measure the waste, and compare it to the lunch waste before the class discussed the importance of a litterless lunch.

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Follow up activities:

- Ask students to create a collage of things that create a litterless lunch.
- Have the students set a personal goal regarding their lunches, and create a chart so they can track it for a period of time.
- Compose a litterless lunch song or story about how they can make a difference.
- Write about how students can help reduce the litter in their lunches at home.

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6. Dear Aquarium Volunteer

Have your students write letters, with pictures, to the Aquarium Volunteer Educators who teach the Spineless Wonders School Program. Your students can tell the Volunteers what they like most about what they saw, touched or heard during their program. Aquarium Volunteers love to receive mail.

Objectives:

- Practice general language arts written skills
- Learn about the physical characteristics and behaviour of a variety of animals
- Teach the value of direct observations
- Reinforce what the students learned during their Aquarium program

Materials:

- Story books
- Pencils, crayons
- Paper
- Large envelope for all the letters and pictures
- Postage

Steps:

1. Discuss your students' visit to the Vancouver Aquarium. What did your students learn? What did they learn that they didn't know before? What surprised them the most? What animal inspired them to learn more about?
2. Have the class read about the ocean.
3. Ask your students to write letters and/or draw pictures to the Volunteers. What did the students like most? What did they learn?

Address:

Volunteer Educators
Vancouver Aquarium
PO Box 3232
Vancouver BC
Canada
V6B 3X8