

## Habitat Monitoring Lesson Plan

Teacher:

Date:

Subject / grade level: Habitat Monitoring / 3<sup>rd</sup>-5<sup>th</sup> grade

Materials:

Scientific Inquiry Outline copies for each student

Transect tape for each group

Quadrat squares for each group (these can be made with PVC pipe or you can simply use picture frames; use a quadrat size that works best for the space you have)

Cameras (optional)

Clipboards for each student

Data sheets adapted for your local habitat – one per student

Bean soup mix (or other collection of items that can be used as examples of species in a habitat)

Next Generation Sunshine State Standards: SC.3.L.15.1, SC.3.N.1.1, SC.3.N.1.3, SC.3.N.1.6, SC.4.L.17.4, SC.4.N.1.1, SC.4.N.1.4, SC.5.N.1.3, SC.5.N.2.2

Lesson objective(s):

-Understand the purpose and process of habitat monitoring

-Use the practice of science to conduct an investigation to monitor a habitat

**Background: ADAPTED FROM "Aquatic WILD K-12 Curriculum" by the Council for Environmental Education (CEE)**

Habitat monitoring allows you to study a population or habitat over a long period of time with multiple inventories. Studying a site over a long period of time can reveal changes in population, new species introduced to the habitat, or other trends that cannot be studied from a one-time visit. When developing an inventory method set to be used multiple times, it is important to establish a standard, repeatable procedure called a monitoring project.

Monitoring involves observing, surveying, or inventorying over a period of time. Monitoring projects have very specific procedures that are repeated.

Because getting an accurate picture of the entire area of a habitat is difficult, scientists use sampling methods. This involves taking a specifically measured sample of a habitat, analyzing what is found there, and using this information to represent the entire habitat area.

One method of sampling is the transect-survey method. This involves laying out a specific length of measuring tape or transect inside of a habitat, allowing the transect to lay directly on top of plants, rocks, structures, etc. At specific intervals (such as every 5 meters), a square quadrat is placed or a photo is taken of the area. At each of these intervals, specific information about the habitat is recorded (such as species found or sediment type). This can be done by direct observation or by analyzing photos in a lab or classroom.

A great example of the transect-survey method is used by the Reef Check organization -

[http://www.reefcheckaustralia.org/files/documents/44/rca\\_monitoring\\_methods.pdf](http://www.reefcheckaustralia.org/files/documents/44/rca_monitoring_methods.pdf)

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### ENGAGEMENT–

*Tape photos of local species around the room ahead of time if you would like to use them in the transect-survey method example.*

1. Gather students in a circle and spread a collection of objects (a bag of soup mix containing beans, pasta, etc. works well) out into the middle of the circle.
2. Explain to students that the mix represents wildlife species in a habitat and the center of the circle represents a habitat itself. Review the definition of habitat and ask the group for some examples.
3. Lead a discussion about how scientists monitor habitats. Why would they monitor a habitat? What would be some challenges they may face? How could they monitor the habitat over time? Allow students to bring up any ideas and facilitate the concept of sampling.
4. Use a local habitat (that you could visit on a field trip) as an example. Ask students what species may be found in the habitat and what challenges you may encounter when monitoring your habitat.
5. How could we sample our circle habitat? Students should come up with sampling ideas such as using rulers or pencils to measure out random samples. In our samples, what can we record? We can record number of each “species” (type of bean or pasta in the soup mix). Anything else?
6. Allow several students to take samples of the circle habitat and announce what is found in each sample. Remind students about the importance of random sampling.

### EXPLORATION –

1. Introduce the transect survey method as one example of a way to monitor a habitat.
2. Assign roles to several students to model an example of the transect-survey method in the classroom. You can lay a transect tape over chairs, desks, etc. to the desired length. At specific intervals (such as every 1 foot or 1 meter), lay a quadrat or take a photo. Model the action of visiting each quadrat and recording specific observations. If you have placed photos of species in the room, be sure that some of those fall into the transect area so that you can record them. You can also model how to clean up after the sample and roll up the transect tape.
3. Divide students into groups of 3 or 4 and distribute the attached “Scientific Inquiry Outline” to each student.
4. Challenge groups to write out our habitat monitoring investigation. Ask students what experimental steps are missing on the worksheet (data, results, and conclusions can be provided after our experiment has been conducted)?
5. When all group members have completed the writing challenge, the group will earn a transect, quadrats, and data sheet (see example for a sea grass habitat attached) in order to practice the survey methods in the classroom (you may want to conduct this portion of the lesson outdoors in a larger area). Encourage students to discuss individual jobs *before* beginning the practice survey.

### EXPLANATION –

1. When groups have had ample time to practice survey methods, gather again as a group. Have students share challenges they faced when writing or practicing the surveys.
2. Ask students how you could use this method in an actual habitat. Maybe you can repeat the procedure in a habitat on school grounds or on a field trip to a local area.

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### ELABORATION –

Conduct surveys in a habitat on school grounds or on field trips. Students can then graph their data by comparing number of species. The activity can also become an ongoing study of a local area. Students can graph a comparison of surveys over time and also draw conclusions regarding the health of the habitat from year to year or month to month.

### EVALUATION -

During group activities, observe student participation and understanding. Collect and review Scientific Inquiry Outlines to determine student understanding and effort.

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### Scientific Inquiry Outline

Question:

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Hypothesis:

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Materials:

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Procedure:

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## Habitat Monitoring Lesson Plan

### Seagrass Monitoring Practice Sheet

Observer:

Date:

Quadrat	Comments	% seagrass coverage	Height (cm)

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