



CORAL REEF ECOLOGY

Concepts

Collecting, recording, and graphing data

HCPS III Benchmarks

SC.4.2.1
MA.4.11.1
MA.4.11.2
MA.4.13.1

Duration

45 minutes

Source Material

PRISM

Vocabulary

Transect Line

Collecting Data Using a Transect Line

Summary

Students will be introduced to the transect line method of surveying. This is a commonly used methodology in field biology. Students will record data on marine debris they find along the transect and represent their data using graphs.

Objectives

- Students will be able to count and record the number of objects on a transect line

Materials

Various items of trash in different numbers (ex. 3 cups, 5 bottle caps, 4 candy wrappers)

“Collecting Data Using a Transect Line” worksheet (1 per student)

Making Connections

Students will build upon the knowledge gained from their previous marine debris experiment. They will use the scientific method in the field to measure marine debris.

Teacher Prep for Activity

Photocopy the “Collecting Data Using a Transect Line” worksheet. Make sure to have a lot of open space and lay the transect line down (you may need to move furniture in your classroom, or go outside). Also make sure you have a variety of debris items for your students. As a pre-lesson in Math, review with your class how to create a bar graph.

Background

Transect lines are used by scientists to estimate the number of items in a given area. If a scientist was interested in learning about the number of species of coral found on a specific coral reef, (s)he could lay a transect line across the reef and count all the species that came in contact with the line. Transect lines are helpful because it would be nearly impossible to count every single coral in an entire ecosystem. Transect lines are just one technique scientists use to sample a population.

Experimental repeatability is important in scientific studies because if a study is not repeatable, there is no evidence that the study was conducted in a non-biased way, and therefore, any results gathered will not be useful. Repeatability is also important so that the study can be done again at a different date to collect more data and look at the way a population fluctuates over time.



For example, a scientist doing research on coral species may have already collected a years worth of data but wants to understand the way the population can change in time, so the following year, (s)he collects more data using the same methods and within the same area and is able to see how the population changed during that year. If the research was not consistent with the last year, the researcher would not be able to make any inferences in the data.

For this lesson, you may notice that some students have different results. Although they all used the same transect line, did they all label the items the same? Were they counting only the items that were on the line? How did they categorize an object that was only halfway on the line? Explain that if these variables are different then they will all have different results so groups MUST record the items the same to have accurate results.

Procedure

1. Use a piece of masking tape to create a transect line on the floor of your classroom or somewhere outside.
2. Spread the trash along both sides of the transect line.
3. Pass out the worksheet. As a class observe the items lying on the transect line from a distance and categorize the items present. Have students write the categories on their data sheet. Make sure all students are aware they must count each item according to the category the class has decided on (i.e., aluminum can, cigarette butt, glass pieces). *If picking up broken glass, please have the children use gloves.*
4. Have students walk over to the transect line as a whole group or in small groups and tally the types of trash they counted on their worksheet.
5. Once each student has counted and recorded the amount of marine debris, have them return to their seats.
6. Explain that now they will use the data they collected to make a bar graph of their results.
NOTE: It may be necessary to provide an example of a bar graph or review the concept of graphing at this time.
7. Discuss with the class whether each person in the class does or does not have the same count of each item and the importance of repeatability in science.

Assessments

Completed worksheet and graphs

Extension Activities

This activity could be conducted during a field trip to a beach, so students are collecting actual marine debris.

Math Connection

As a pre-lesson, review making bar graphs during Math. This will prepare students to represent their transect data.



Name _____

Collecting Data using a Transect Line Worksheet

Item	Number that was collected
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Graph the results from your trash collection

