

Discrete versus Continuous Data

A Classroom Activity for the Ocean Gazing Podcast

Grade Level: 6-12

Lesson Time: 25 min.

Materials Required

- ✓ computers with PowerPoint and/or internet access
- ✓ Discrete v. Continuous PowerPoint file
- ✓ Projector (optional)
- ✓ student worksheet

Summary

There are several types of data collected and used by scientists in research.

Objectives

Students will be able to explain the difference between discrete versus continuous data.

Vocabulary

Real time data, Continuous data, Discrete data, Observing networks,

Introduction

How we collect and use information is changing. Stockbrokers used to watch a tickertape that sent stock prices around every half-hour or so. Doctors used to monitor the critically ill minute by minute. And meteorologists would study day-old weather maps to predict storms such as hurricanes or tornados. Today each of these

professionals uses information that's no more than a few seconds old. Times have changed. These days, REAL TIME rules!

On the internet, real time doesn't always mean REAL TIME with data available the moment it is collected. Rather, real time data are updated on a regular basis and frequently changes. For example, weather satellite images updated every hour are still referred to "real time data." At first, the distinction among real time data, near-real time data and archived data may not be clear. However, as you continue to explore these resources, this difference will become easier to see.

So what are the advantages of using real time data in the classroom? Research has shown there are measurable advantages. Beyond the dramatic National Assessment of Educational Progress (NAEP) Science findings of 2000, which revealed a statistically significant increase in scores of those students who downloaded and analyzed data, there also exists compelling evidence that this approach to science instruction improves standardized test scores (National Center for Education Statistics, 2001). Furthermore, in a review of studies on problem solving, it was concluded good problem solvers work harder than poor problem solvers. Most studies of thinking find that problem



solvers need to be conscious of their own reasoning processes by talking or writing down their thoughts (Lockhead 1981).

While there are many exciting and stimulating real time data web sites available for classroom use, these resources should NOT replace opportunities for students to collect data themselves through hands-on experimentation. The use of real time data should enhance how and what students learn. It's important to stay aware of this issue and make careful decisions about when to use real time data to enhance the curriculum.

The purpose of this activity is to help you explain to your students the difference between discrete (snapshots) and continuous and real time data. This activity will take approximately 15-25 minutes to do with your students.

Data Activity

In this activity students will review examples of data to deduce which types of data are more helpful in different situations.

1. Access the Discrete v. Continuous PowerPoint file.
2. Review the series of photographs and attempt to determine what has happened based on the information available.
3. Complete the student worksheet.

National Science Standards

Science as Inquiry

Abilities necessary to do scientific inquiry (K-4, 5-8, 9-12)

Science in Personal and Social Perspectives

Science and Technology in Society (5-8, 9-12)

Ocean Gazing Podcast

The related podcast episode for this activity can be found by going to the podcast section of www.oceangazing.org