Lesson 1, Introduction to Statistics, Grade 10-12

Goals
This lesson is designed to introduce students to statistics, and to encourage a sense of skepticism regarding all statistical claims and data.

Specific Learning Objectives
To respond to a set of statistical claims made in a video (informally assessed – see below)

Rationale
This lesson serves as an introduction to statistics and to the Global warming data that will be used throughout the unit. By reviewing the responses that students turn in, the instructor will be able to see what prior knowledge the students bring to class and adjust accordingly.

NCTM Standard
- understand the differences among various kinds of studies and which types of inferences can legitimately be drawn from each;

Prerequisite Knowledge
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Materials Required
Global Warming Statistics Video
Duluth, MN Weather History Sheet

Possible Student Solution Paths
On this first day of the unit, students should be encouraged to use any technique they have previously learned. As the unit progresses, we will introduce specific vocabulary and procedures to follow.

Opening Activity
- Video
  - Play video once without any introduction.
  - Question the class on what they heard. What statistics were given? How were the statistics justified? Did they present graphs, data, anything to support their claims?
- Play video a second time, but this time, ask the class to write down all statistics in the video.
  - Example: Carbon is higher now than it has ever been in the past thousand years.
  - Sea levels are rising.
  - Humans have a role in climate change.
  - There are a total of 24 statistical claims (that I could count)

Concept Activity/Task
- Make a list of at least 10 claims from the video.
- For each claim, write down what information would be required to verify that claim.
• Describe how the data could be used to “prove” or “disprove” the claim made in the video.
• Write down possible sources for that data.

Examples
• In the video, a claim is made that “sea levels are rising.”
  o To test this claim, we could gather information from the internet – possibly a governmental organization.
  o To determine whether or not sea levels are rising, we could compare the average sea level 20 years ago to the average sea level today.
  o Problem: How could we get sea level data from 100 years ago? 1000 years ago?

[Note: Students may answer with words like “average” or “compare” and we should encourage this type of thinking as a good place to start. Over the course of the unit, hopefully the students will learn to use more precise, statistical vocabulary.]

Transition
Bring the discussing from global trends to local statistics.
[show the Duluth, MN data]

Checking for understanding/Assessment
Students will turn in a list of 10 claims and responses to those claims. (not graded)

Summary/Closure
Reading Strategy: Differential Scale (from Kylene Beers “When Kids Can’t Read”)
[write the following statements on the board and have students respond]

“A rise in the average temperature over time in Duluth, MN means that Global warming is a likely true.”
Agree _______________________________________________________ Do not Agree

“We can trust the statistics in the video because it is produced by a reputable organization.”
Agree _______________________________________________________ Do not Agree

Assignment
None