Collecting Data

✤ VIDEO OVERVIEW ✤

Collecting Data examines the topic of surveys and sampling. The video focuses on the activities of Students for a Better Earth as they sample roadside trash and litter to determine the level of pollution along highways in their community.

The first topic of the video introduces surveys and sampling and provides definitions and examples of each.

In the second topic the steps for creating a successful survey are discussed. Various types of surveys are examined including postal surveys, telephone surveys, personal surveys, and electronic surveys. In addition, statistical sampling is discussed including purposive sampling, random sampling, multi-stage sampling, stratified sampling, and sampling bias.

In the third topic the video discusses the physical gathering of samples. A case study involving a roadside trash sampling activity conducted by Students for a Better Earth is documented.

In the process of conducting the study, the volunteers in Students for a Better Earth:
- Use random sampling to make probability predictions.
- Read, interpret, and construct a bar chart.
- Read, interpret, and construct a frequency table.

The following key concepts are presented in the video.
- Surveys are a technique for gathering specific individual information from an overall large population.
- Sampling means isolating individuals from the total population at random, with the hope that the individual sample reflects the characteristics of the general population.
- To conduct a successful survey or sampling activity you must plan ahead.
- A statement of purpose is necessary to clearly define a survey or sampling activity.

- A clearly defined survey target or "sample" is necessary to minimize the chance for bias or misrepresentation.
- Purposive sampling means that you choose your survey target with a purpose in mind.
- Random sampling means that your survey target is chosen completely at random.
- Random number tables can be used when conducting random sampling activities.
- Combination sampling involves using both purposive and random sampling.
- Multi-stage sampling involves the selection of the survey target in stages in order to reduce the effort and cost required.
- Stratified sampling involves dividing the total population into categories that are linked by a common thread.
- Various survey techniques are used including postal surveys, telephone surveys, personal surveys, and electronic surveys.
- Survey questions must be unbiased.
- Limiting the range of responses in a survey will make the survey results easier to process.
- The physical gathering of samples is often used as a quality control procedure in business.

✤ DISCUSSION QUESTIONS ✤

Before viewing the video, set the scene by asking your class the following questions. After soliciting some answers, distribute the answer sheets.

Question 1 - What is the purpose of a survey?

Answer - Surveys are a technique for gathering specific individual information from an overall large population.

Question 2 - What does "sampling" mean in the world of statistics?

Answer - Sampling means isolating individuals from the total population at random with the hope that the individual sample reflects the general characteristics or behaviors of the general population.

Question 3 - What does "random" sampling mean?

Answer - It means that no member of the population has a better chance of being selected than any other.

Question 4 - List some of the types of surveys or sampling activities used today?

Answer - Physical gathering of samples, postal surveys, telephone surveys, personal surveys, and electronic surveys.

✤ MATH PROBLEMS ✤

After you are finished watching the video, complete the following math problems to assist Students for a Better Earth in their statistical study.

Problem 1:
Along a five-mile section of road, our volunteers selected five 100-foot sections of road and collected trash. They collected the following.

Type of Trash	Number of Items	Total Weight of Items
Paper and cigarettes	125	6 pounds
Metal cans	22	7 pounds
Plastic containers	37	37 pounds
Glass bottles	18	18 pounds

A. Of the total number of items collected, what percentage was paper?
_____

B. Of the total weight of items collected, what percentage was plastic?
_____

C. Based on this 500-foot sample, what would you expect the total weight of trash to be for the entire five mile stretch of roadside?
_____

Problem 2:
Create a bar chart to see a comparison between the weights of the different classifications of trash.

Problem 3:
Create a frequency diagram to see a comparison between the number of items of trash collected.

Collecting Data – Answer Key
❀ MATH ACTIVITY ❀

Problem 1:
Along a five-mile section of road, our volunteers selected five 100-foot sections of road and collected trash.

A. Of the total number of items collected, what percentage was paper?
61.8%
B. Of the total weight of items collected, what percentage was plastic?
18.3%
C. Based on this 500-foot sample, what would you expect the total weight of trash to be for the entire five mile stretch of roadside? **1320 pounds.**
(They collected 25 pounds of trash in the 500-foot sample. There are 52.8 five hundred foot sections in five miles).
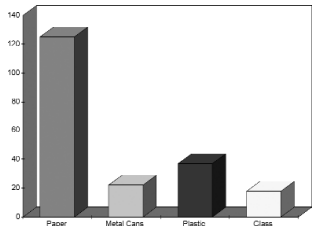
Problem 2:
Create a bar chart to see a comparison between the weights of the different classifications of trash.
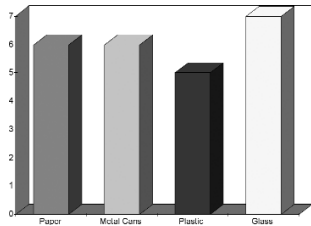
Problem 3:
Create a frequency diagram to see a comparison between the number of items of trash collected.

Measuring Your World

Collecting Data

COLLECTING AND RECORDING STATISTICS

TEACHER'S GUIDE

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