Collecting Data

Information

Common core icons

This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.

Slides containing examples of mathematical modeling are marked with this stamp.

This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

These are:

1) Make sense of problems and persevere in solving them.

2) Reason abstractly and quantitatively.

3) Construct viable arguments and critique the reasoning of others.

4) Model with mathematics.

5) Use appropriate tools strategically.

6) Attend to precision.

7) Look for and make use of structure.

8) Look for and express regularity in repeated reasoning.

This icon indicates that the slide contains activities created in Flash. These activities are not editable.

This icon indicates teacher's notes in the Notes field.

Introducing data collection

How long does it take most students to get to school in the morning?

How would you go about answering this question?

You would need to ask the students at your school how long it takes them to get to school in the morning.

This is called **data collection**.

Questions that are answered through data collection are called **statistical questions**.

Collecting Data Toolkit

Press the buttons to find out about four tools that can be used to collect data.

- questionnaire
- data collection sheet
- primary sources
- secondary sources

Using tally marks

Number	Tallies	Frequency
None		
One		
Two		
Three		
Four		
Five		
Six		
Seven		
Eight +		

Press to fill in the tallies.

Accounting for Variety

Before collecting the data to answer a statistical question, we need to think about the kind of answers to expect.

Pilot surveys

Once you have written a questionnaire, it is a good idea to try it out on a small number of people.

This is called a **pilot survey**.

Note down the responses and use these to refine any questions that are causing difficulty.

Do I use a check or an 'X' to mark the box I want?

There isn't a box for my answer.

What does this question mean?

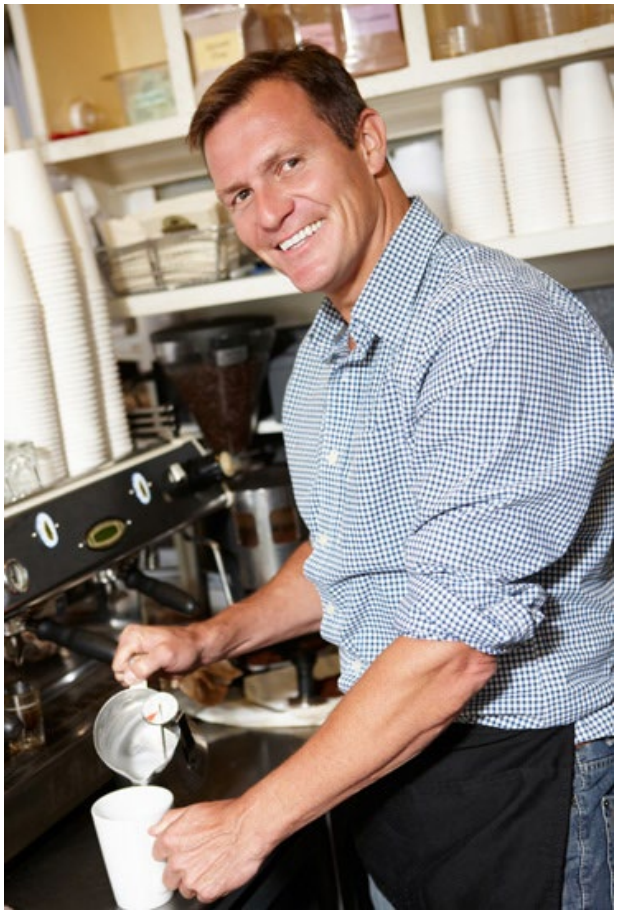
I don't want to answer this question because it's too personal.

Collecting data example

Mr. Wallace is planning to open a café in your local area. He needs to know what types of food and drink to sell.

Design a questionnaire to help Mr. Wallace reach a decision.

- How many questions will you ask?
- How will you make your questions specific?
- How many people would you ask?
- How could you use the results to help Mr. Wallace reach a decision?



The population

When collecting data, you would ideally examine the whole group that you are interested in studying. The whole group is usually known as the **population**.

However, it is usually impractical to include every member of the group that is being investigated.

We therefore choose a **sample** to represent the population.

Samples

A **sample** is a small part of the population that has been chosen to represent the whole population.

The sample should be **representative** of the whole population.

Why is it important to make the sample representative?

It is also important to make the sample as **large** as possible.

Why is it important to make the sample as large as possible?

Sampling methods

Match each term to its definition

There are several different methods of sampling.
Can you match each method to its definition?

Press **start** to begin.

start

syste… sar… …and …h group

ran… sar… …who …ted

conve… sar… …lect …

stratifie… sar… …has …cted

self-selected sample

members of the population are selected based on a rule

Avoiding bias

In a **biased sample**, part of the population is over-represented or under-represented.

Ms. Clarke wants to know whether students' parents would like an upgrade to the athletic field, or if they would prefer to upgrade the auditorium where school plays are held.

If Ms. Clarke took a survey at the school's Friday night soccer game, the sample would probably be **biased** toward the new athletic field. This is because the parents asked are likely to have children who use the athletic field.

Understanding bias

Decide if each sample described below is biased and press on your answer.

One weekend, a teacher sent students to the local diner to take a survey of what activities students prefer to do on a weekend night.

biased

not biased

Appropriate samples

Press play to learn more about appropriate sampling.