Dear Family,

This week your student is exploring random samples.

Sometimes you want to gather information from a group, or a **population**. Depending on the size of the population, it can be very difficult, or even impossible, to survey every member of the group. It is more practical to survey a smaller subset, or a **sample**, of the group. When you select a sample, you want it to be as much like the entire population as possible. That way, any conclusions you draw from the data are more likely to be true for the whole population.

In a **random sample**, every member of the population has an equal chance of being selected for the sample. A random sample is more likely to be representative of a population than other types of samples. So, you can use a random sample to draw conclusions about the entire population.

Your student will be exploring problems like the one below.

> A dance school director wants to know what type of dance the students at their school like best. Describe how the director could select a random sample of students to survey.

➤ **ONE WAY** to take a random sample is to pull names from a bowl.

- Write the name of each student on a slip of paper.
- Put all the slips in a bowl and mix them up.
- Choose slips until you have reached the number of students you want to survey.

➤ **ANOTHER WAY** is to use an alphabetized list.

- List all students in alphabetical order.
- Roll a number cube to select a number 1–6.
- Start with the person on the list with that number. Then select every sixth name on the list.

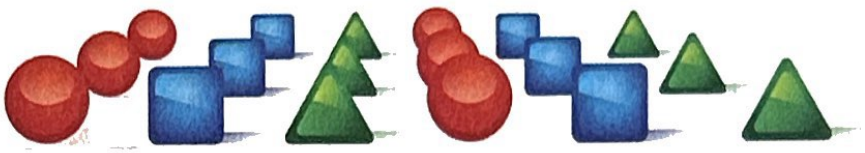
Using either approach, the dance school director will get a random sample because each student has an equal chance of being chosen for the sample.

Use the next page to start a conversation about samples of populations.

parent signature

UNDERSTAND: How can you use samples to gain information about a population?

Explore Sampling

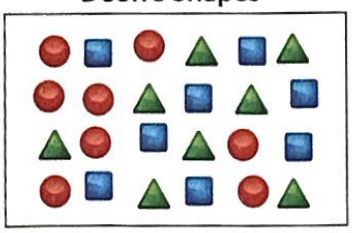


Model It

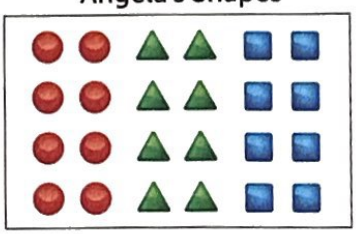
➤ **Complete the problems about populations and samples.**

1. Deon and Angela each analyze a set of shapes. Whose set of shapes appears to be arranged randomly? Explain.

Deon's Shapes



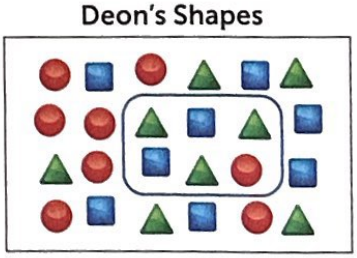
Angela's Shapes



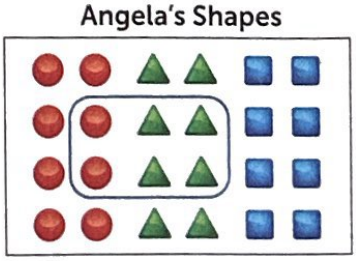
Deons shapes do not appear to be arranged in any particular pattern. Angela's shapes are grouped by color and type.

2. Each set of shapes is a **population**. A population is the entire group being studied. Sometimes it can be difficult or take too much time to collect data from every member of a population. In these cases, you can collect data from a **sample**, or smaller set, of the population. The circled group of shapes in each set is a sample.

Deon's Shapes



Angela's Shapes



a. How are the populations of shapes the same?

Each have a total of 24 shapes with 8 circles, 8 triangles and 8 squares

b. How are the samples the same? How are they different?

They each have six shapes.

The type of shapes are different.

c. A sample that is representative of a population has similar characteristics to the population. Which sample is more representative of the population? Why?

Deons because his sample includes all three types of shapes from the population

DISCUSS IT

Ask: How are a population and a sample related?

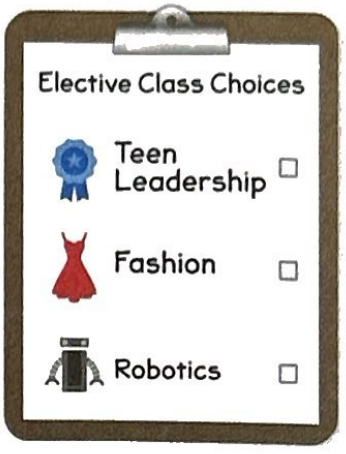
Share: I think Deon's sample would be more representative of the population if . . .

Learning Targets SMP 2, SMP 3, SMP 7

- Tell whether a survey method is likely to lead to a random sample of a population.
- Explain why a random sample is likely to be representative of a population.
- Tell whether data from a random sample supports a conclusion about a population.

Model It

➤ **Complete the problems about representative samples.**



3 Issay's school plans to add one of three new elective classes next year: *teen leadership, fashion design,* or *robotics*. Issay wants to know which class the students at his school want most. He plans to survey a sample of the population. Will each approach result in a sample that is representative of the population? Explain.

a. surveying all the teachers at the school

Not representative of the population.

The teachers are not part of the Student population

b. surveying all of the students on the student council

Not representative of the population

Students on the student council will more likely to want teen leadership.

c. surveying five students in each math class

Representative of the population

This sample will include a variety of students with a variety of interests

d. surveying every fifth student who buys lunch on a certain day

Not representative of the population

the students who buy lunch might not be representative of all the students

DISCUSS IT

Ask: Which approach do you think Issay should use? Why?

Share: I think another way Issay could get a representative sample is to . . .

4 **Reflect** Why is it important to use a representative sample when you want to learn something about a population?

You want the makeup of your sample to be as close as possible to the makeup of your population. Then information about the sample will probably also describe the population.