

Understand Statistical Questions

 **Think It Through****Why ask statistical questions?**

When you want to find out more about something, one thing you can do is ask questions. Some questions have exact answers, such as, “How many people are in your class right now?” Other questions can have many answers, such as asking some sixth graders, “What is your favorite kind of music?”

When you want to find out what kind of music all sixth graders like most, there are likely too many people to ask. By asking 20 sixth graders, “What is your favorite kind of music?,” you can get a good sense of the type of music all sixth graders like. If you asked another class of sixth graders the same question, your results would probably be similar but not exactly the same.

When you ask a question to make a prediction about a larger group, you are asking a statistical question. **Statistical questions** do not have an exact answer; you expect to get a variety of answers. So answers to statistical questions have variability. Non-statistical questions have exact answers.

Think What does it mean for a question to be statistical?

Sasha wants to collect statistical information about the different sports sixth graders at her school like to watch. She writes 3 questions to ask 50 sixth graders and will use the results to make a prediction about all sixth graders. Which questions are statistical and which are not?

- When is the next home basketball game?
- What is your favorite sport to watch?
- What was the last sports game you watched at this school?

The first question is not statistical because the date of the next home game is the same no matter whom or how many people Sasha asks.

The next two questions are statistical because you would expect some variability in the answers. Sasha could use the responses to think about the different sports that sixth graders like to watch.



Circle a statistical question where you might expect many different answers.

Think How do I write statistical questions?

What statistical question could Sasha ask if she was interested in knowing what school sport sixth graders like to watch the most?

Look at the questions Sasha wrote. "What is your favorite sport to watch?" is too general. Someone's favorite sport to watch might not be a school sport. There may be too many varying answers.

"What was the last sports game you watched at this school?" is too specific. Depending on the time of year or what home game was most recent, there may not be enough variability.

To collect data on what school sport sixth graders like to watch the most, Sasha could ask:

"Which school sport are you most interested in watching? Circle one from the list below."

Then Sasha could list all the school sports at her school.

Possible responses would be one of the listed sports. The varying answers would help Sasha draw conclusions about which sports sixth graders at her school most like to watch.

Now you'll have a chance to think more about statistical questions and the data they help collect.



What are possible answers to this question? Are the answers too general? Too specific?

▶ Reflect

1 Explain the difference between a question that is statistical and one that is not.

Think About**Identifying Statistical and Non-Statistical Questions**

Let's Explore the Idea Determine whether each question is statistical or non-statistical. Then, explain your answer.



- 2** A political group asked voters waiting in line to vote: Who are the 2 major candidates running for president this year?

- 3** The journalism club surveyed students in the library and asked: About how much time do you spend reading each day?

- 4** To decide if a new movie should be shown this Friday, a movie theatre invited 50 people to view the movie and answer the question: Did you enjoy the movie?

- 5** A sixth grader asks her guidance counselor: How many clubs and sports are open to sixth graders at this school?

Write statistical questions.

- 6** Write both a statistical and a non-statistical question you could ask some classmates to make a prediction about teenagers and text messaging.



Let's Talk About It

Solve the problem below as a group.



- 7** Use an example from the previous page to explain what it means for a question to have statistical variability.

- 8** Look at problems 2–5. How could you change one of the non-statistical questions so that it is statistical? Explain.

- 9** Look at the questions you wrote in problem 6. Explain why the answers do or don't have variability.

▶ Try It Another Way Look at these survey results and think about a possible statistical question.

- 10** Mia surveyed her classmates to make a prediction about kids her age.

Hours	0	0.5	1	1.5	2
Number of Students	2	8	5	3	1

Which could be a question Mia asked? Explain.

- How many people do not watch TV?
- How many TV shows do you watch regularly?
- About how long do you spend watching TV every day?

Connect Identifying Statistical Questions

Talk through these problems as a class. Then write your answers below.

11 Compare Which question is statistical and which is not? Explain how you know.

- What is your favorite Olympic sport to watch?
- When are the next Olympic games?

12 Analyze Which is a better statistical question to ask your classmates if you are interested in finding out which movies sixth graders enjoy watching? Explain.

- What is the most recent movie you saw?
- What are three of your favorite movies?

13 Predict Which statistical question would result in more variability? Explain.

- Do you own a scooter and/or bicycle?
- About how many hours per week do you participate in sports?

Apply  **Identifying Statistical Questions**

Use what you have learned to complete this task.

14 Put it Together Write statistical questions and analyze the variability in the answers.

Part A Write two statistical questions that you are interested in asking the students at your school.

Part B Choose one question. Ask at least 10 of your classmates and record the answers in a line plot.

Part C Explain how your classmates' answers showed variability.

Part D Explain why you would expect variability in the answers if you asked a different group of students the same question.
