

Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*

## LESSON: STATISTICAL FRIENDS

### Which questions are statistical questions?

Understanding the criteria for a statistical question is the cornerstone of all statistics. During *Statistical Friends*, Ayla has an upcoming quiz and is having trouble understanding what types of questions are statistical. Her friend David steps in to help and creates a list of questions to help Ayla learn the difference between statistical and non-statistical questions. The data provided is the page from David's notebook with ten sample questions.

Download the Detailed Lesson Plan

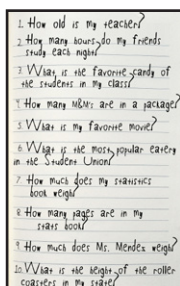
Available on the Teacher Dashboard

## The Math Simulator™



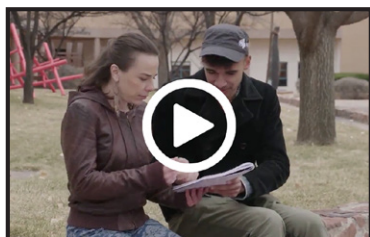
### 1 Immersion

- Play *Statistical Friends Immersion* video, whole-class.
- Restate the question: **Which questions are statistical questions?**
- Facilitate classroom discussion; ask students: "What are your ideas?"



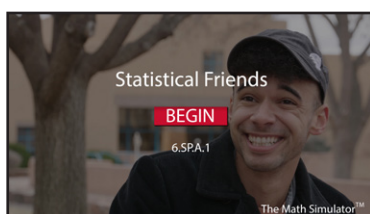
### 2 Data & Computation

- Print the *Data Artifact* and distribute to students.
- Allow students work time. Ask students: "Does your answer make sense?"
- Consider using a sharing protocol leading to mathematical insights and/or highlighting misconceptions.
- Allow students to revise their work.



### 3 Resolution

- Play *Statistical Friends Resolution* video, whole-class.
- Prepare and give brief lecture (*Teacher Instruction*).



### + Simulation Trainer (Use student headphones.)

- Assign the *Simulation Trainer*.
- Use protocols that encourage students to help each other.
- Use *Progress Monitoring* to access real-time data for the classroom.
- Provide individual help for students who are not making progress.

Instruction at a Glance



**Gladys  
Graham**



**Kevin  
Simpson**



**Megan  
LeBleu**

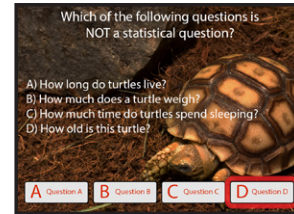
**Gladys:** Consider providing students with an envelope of questions that they can categorize. Some questions should be statistical and others should not. Give students freedom initially to categorize in any manner they choose. Afterward, if you need to direct them to think about the responses that each question might get, do so then.

**Kevin:** As a way to check for understanding, provide students with a list of non-statistical questions and ask them to rewrite them in the form of a statistical question.

**Megan:** Expose students to questions resulting in both categorical (qualitative) and numerical (quantitative) data. Explore different ways to analyze each type of data.

**Standard Math Procedures**

Ex. Clicker Quiz #2



- 1 Consider the anticipated data from each question.
  - A) Data will vary.
  - B) Data will vary.
  - C) Data will vary.
  - D) Data won't vary. There is only one response.
- 2 Determine which question is not statistical.
  - D: Question D

**Clicker Quiz**

Launch the *Clicker Quiz*, whole-class.

Ayla's quiz had one bonus question for extra credit.

What answer should Ayla have selected?

**Bonus Question (1 point)**

Which are the statistical questions?

- a) How many screwdrivers does a household typically have?
- b) In what month is the current President's birthday?
- c) How many children does the average American family have?
- d) How old were you when you learned to ride a bike?

**A** a) and d)

**B** b) and d)

**C** a) and c)

**D** b) and c)

Which of the following questions is NOT a statistical question?

- A) How long do turtles live?
- B) How much does a turtle weigh?
- C) How much time do turtles spend sleeping?
- D) How old is this turtle?

**A** Question A

**B** Question B

**C** Question C

**D** Question D

Which group contains only statistical questions?

<p>How old are you?</p> <p>When is your birthday?</p>	<p>How old are people when they get married?</p> <p>How often do people replace their cellphone?</p>	<p>How much time do penguins spend swimming?</p> <p>What color are your shoes?</p>
<b>A</b> Blue Group	<b>B</b> Red Group	<b>C</b> Yellow Group

Which phrase can be inserted into the blank to make the statement true?

A statistical question is one that can be answered by collecting data which is expected to \_\_\_\_\_.

**A** all be the same

**B** vary

**C** be overwhelming

"How much time do 6<sup>th</sup> graders spend watching TV in a week?" is a statistical question.

Which statement supports why this is a statistical question?

**A** The amount of time a 6<sup>th</sup> grader spends watching TV could vary from student to student.

**B** Data must be collected to find the answer.

**C** The time spent watching TV may vary from week to week.

**D** All of the above

Jason is studying the population of geese at a local park, over time.

Which question is a statistical question that could aid him in his research?

**A** How many geese are at the park right now?

**B** What color are the feathers of female geese?

**C** How many geese visit the park on an average day?

**D** Do you know anyone who owns a pet goose?

**6.SP.A.1****About this standard**

Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.*

## STATISTICAL FRIENDS

### Which questions are statistical questions?

Ayla was struggling in her Statistics class with the concept of statistical questions. Her friend David was really able to help her study for her quiz, and she is confident that she did very well. Below is a copy of the quiz she received in class. If Ayla got 100% on the quiz, which questions did she mark as statistical?

Circle the statistical questions on Ayla's quiz.

Name: *Ayla*  
Stats 101 Quiz  
Section 4  
Week 2

Directions: Circle the number of each question that is statistical.

- 1) How many guests does Vinny's Italian Restaurant serve each night?
- 2) How old is the President of the United States?
- 3) How many cats and dogs are adopted each year in the United States?
- 4) How many fish did Pete's Pet Palace sell today?
- 5) How many pairs of shoes do you own?
- 6) How much time do college students spend studying each week?
- 7) What is the average height of a 3-year-old?
- 8) How much was the car salesman's paycheck last month?
- 9) How many eggs come in a dozen?
- 10) How many books do college students read in a year?

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

## APPLYING THE STANDARD

How might this standard appear on a test?



CHECK OUT MY  
WORKED EXAMPLE  
#1 AND 2

Determine whether each question below is *statistical* or *non-statistical*.

- |  |                                |
|--|--------------------------------|
| 1) Do you like apples?   | Statistical or Non-Statistical |
| 2) How many students have their ears pierced in 4 <sup>th</sup> grade? | Statistical or Non-Statistical |
| 3) Did you go to the movies this weekend?                              | Statistical or Non-Statistical |
| 4) Which day of the week is the most popular day to go to the movies?  | Statistical or Non-Statistical |
| 5) What is the average height of a 6 <sup>th</sup> grader?             | Statistical or Non-Statistical |
| 6) How many days are in June?  | Statistical or Non-Statistical |
| 7) How tall is your mother?  | Statistical or Non-Statistical |

Select from the phrases below to fill in the blanks and make the statement true.

- 8) A statistical question is one that can be answered by \_\_\_\_\_ and has \_\_\_\_\_.

collecting data

asking one  
person

only one  
answer

variability in  
the data

- 9) Write a statistical question that could be answered by collecting data from your classmates.

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- 10) Data can be either *numerical* or *categorical*. Determine whether the specified data would be *numerical* or *categorical*.

- a) Height      b) Birth month      c) Eye color      d) Age      e) Favorite food