6.SP Statistical Questions

Alignments to Content Standards: 6.SP.A.1

Task

Last night, Jennifer and her family went out for dinner. The questions below came up on their way to the restaurant or during the meal. Decide whether or not each question is a statistical question, and justify your decision.

a. How far are we from the restaurant?
b. How long will it be until we get there?
c. Would Jennifer rather have burgers or pizza?
d. How much should we leave for the tip?
e. What was the first dish ordered in the restaurant this evening?
f. Do customers at the restaurant like pizza?
g. What is a typical bill for tables at this restaurant?
h. On average, how many people were sitting at each table this evening?

IM Commentary
The goal of this task is to promote a discussion of what makes a statistical question. This is an ideal place for a classroom discussion because answers are not always clear cut and there is a continuum going from questions that are clearly not statistical (Who was the King of France in 1716?) to questions that are definitely statistical (What is the average lifespan in the United States?). There is a lot of ground in between because a question can be interpreted and answered in different ways. A statistical question is one that can be answered by collecting data and for which there will be variability in that data. Questions that are answered with a single data point are not statistical questions because there is no variability in the data used to answer the question.

Solution

a. This is not a statistical question if the route to the restaurant is determined or if the question is intended "as the crow flies". In these cases, it would be a fixed numerical answer, which is likely what is intended by the question. It could be viewed as a statistical question if it referred to time rather than distance (e.g. On average, how long does it take to get home from the restaurant?).

b. Unlike the first question, this is a statistical question. Variables such as traffic signals and the amount of traffic rule out an exact answer. The answer will be an approximation based on repeated experience of similar conditions and drives. That is, the answer would be based on data that vary.

c. This question refers to a single person and so it would be answered based on a single response and not on data that vary.

d. This could be a non-statistical question if, for example, the family always leaves a fixed percent of the bill for a tip. On the other hand, there may be a discussion and consideration of how much everyone enjoyed the meal and service with each person suggesting a tip amount. This would make it a statistical question.

e. This is not a statistical question. The first dish ordered is a fixed item and this question would not be answered by collecting data that vary.

f. This is a statistical question (unless we know in advance that everyone is going to say yes or no).

g. This is a statistical question. It would be answered by collecting data on the amount
of the bill for different tables, and this amount would vary from table to table.

h. Like the previous question, this is a statistical question. It would be answered by collecting data on the number of people at a table from many tables and there would be variability in the data collected.