Helping With Math

Understanding Statistical Questions

GRADE 6

Statistics is a form of mathematical analysis that utilizes quantified models, representations and synopses for a given set of experimental data or real-life studies. It studies methodologies to gather, review, analyze and draw conclusions from data.

One of the renowned applications of statistics is conducting survey. What makes survey a good application of statistics? Let's find out.

STATISTICS

A branch of mathematics that involves....

COLLECTING

The process of obtaining data from a given set of sample/population.

ORGANIZING

The process of arranging data through charts, tables, etc.

SUMMARIZING

It means contextualizing the data into meaningful information for public.

ANALYZING

This refers to examining the relationship, patterns, trends, etc of the given data.

DECISION-MAKING

It means being able to draw conclusions, generalizations, prediction, etc.

The Two Areas of Statistics

| Descriptive Statistics	Inferential Statistics
● It deals with methods for collecting, organizing, and describing data by using tables, graphs, and summary measures.	● It deals with methods that use sample results, to help in estimation or make decisions about the population.

To understand more about statistics, you need to familiarize yourself with the following basic statistical terms:

1. **Population** - is the set of all elements (observations), items, or objects that share common characteristic/s and at least one that will be studied their properties for a particular goal.
2. **Sample** - is a subset of the population selected for study.
3. **Element** - (or member of a sample or population) is a specific subject or object about which the information is collected.
4. **Variable** - is a characteristic under study that takes different values for different elements.
5. **Observation** - is the value of a variable for an element. It is also known as measurement.
6. **Quantitative variables** - these give us numbers representing counts or measurements.
   - **Discrete variables** are assumed values that can be counted
   - **Continuous variables** are assumed values that can be measured. There are usually intervals.
7. **Qualitative variables** - (or categorical data) gives us names or labels that are not numbers representing the observations
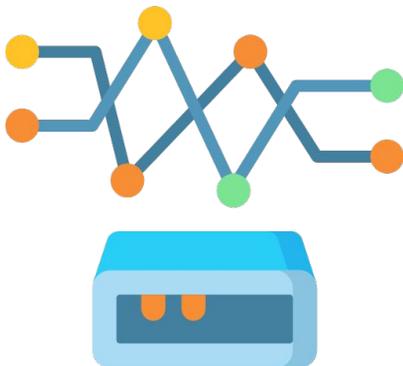
Look around you, can you identify the objects or measurements that are examples of these statistical terms? List them down here:

_____

_____.

Statistics is used to explore phenomenon, existing event, or even future events. All questions have answers but not all of them can be called as statistical question.

Statistical Questions

A question is considered statistical if that requires various answers. The answer can be in a form of percentage, range, interval or average. On the other hand, it is non-statistical if it seeks for exact answer.

Examples of Statistical Questions	Examples of Non- Statistical Questions
• What do 7th graders prefer for afternoon snacks? • What is the usual number of dogs your neighbors have?	• How old is your dog? • What is the name of your classmate on the fifth row?

Create your own example of statistical questions. Write them here:
1.

2.

TABLE OF ACTIVITIES

DASHBOARD FACTS

This dashboard is ready to figure out what is true and what is not. Write FACT if the statement is correct otherwise replace the underlined word/phrase to make it right.

1. _____ > <u>Statistics</u> is a branch of mathematics that involves collecting, organizing, summarizing, and analyzing of data to make sound decisions or conclusions.

2. _____ > <u>Descriptive</u> Statistics is the area of statistics that utilizes sample results, to aid estimation or decisions about the population.

3. _____ > <u>Population</u> refers to the subset of the people being studied while <u>sample</u> is the collection of all elements.

4. _____ > Discrete variables are data that can be counted while <u>complex</u> variables are the ones that can be measured or has intervals.

Bonus Question: Who is the father of modern statistics?
Answer: _____

STATISTICAL POLL

Mr. Ray is conducting a statistical poll for his studies. Help him accomplish this task. Identify whether the following situations show collecting, organizing, summarizing, analyzing of data, or decision making.

1. Mr. Ray had interviewed five individuals regarding their preference for the next president of their country.

2. He created a chart to represent the responses of the participants.

3. He conducted an online survey to ask for follow-up questions.

4. He noticed that the responses of his participants are related to the values that they find important in electing the new president.

5. Mr. Ray has concluded that his sample in the study prefer a leader that shows integrity and excellence in ruling the country.

6. He thinks that the candidate who is leading on the recent electoral survey will be the next president of his country.

My Survey Form

Write your answers here:

1. _____

2. _____

3._____

4._____

5._____

6._____

RATING MODE

Set yourself in rating mode as you sort the following situations if this is an example of descriptive (D) or inferential (I) statistics.

1. In the year 2030, 248 million Americans will be enrolled in HMO.

2. Nine out of ten on-the-job trainees are men

3. Expenditures in the cable industry were $8.77 billion in 2000.

4. The middle value obtained of studying Household income for people aged 24-35 is $35,888.

5. Allergy therapy makes bees go away.

6. Drinking decaffeinated coffee can raise cholesterol levels by 7%.

7. The national average annual medicine expenditure per person is $1052.

8. Experts say that mortgage rates may soon hit bottom.

9. Scientists said that the world's population will reach 20 billion in the next 5 years

10. Your classmates prefered to play mobile games than reading books.

1.	2.	3.	4.	5.
6.	7.	8.	9.	10.

MAGNIFYING GLASS SURVEY

This magnifying glass will help you identify basic statistical terms used in the following situations. Write your answer on the space provided.

You conducted a short survey on 100 18-20 aged people regarding their mobile phone preference. The result revealed that 65% of the respondents chose the mobile phone with the highest camera resolution over the one with larger storage capacity.

You are interested to know the favorite genre of the book that your classmates love to read. So you asked 20 boys and 15 girls to seek for answer. You found out that majority of them love science-fiction books.

1)

A. Population:

B. Sample:

C. Variable:

D. Qualitative/
   Quantitative:

E. Discrete/
   Continuous:

2)

A. Population:

B. Sample:

C. Variable:

D. Qualitative/
   Quantitative:

E. Discrete/
   Continuous:

COLLECTING FACTS

Watch two news tonight that involves poll/survey. Indicate basic details about it and basic statistical terms you saw.

1. News' Title: Date:

   Population: Sample:

   Variable: Qualitative/Quantitative

   Discrete/Continuous:

   Summary of the news episode:

1. News' Title: Date:

   Population: Sample:

   Variable: Qualitative/Quantitative

   Discrete/Continuous:

   Summary of the news episode:

EMOJIS' APPROVAL

Make the emoji happy by identifying if the following questions are statistical or not. Draw a smiley face if it is a statistical question otherwise draw a sad face.

1. What is the favorite beverage of the customers in the local restaurant?
2. What time do most people eat their dinners?
3. What do 6th graders prefer to eat for lunch?
4. How many votes did the winning candidate for the Student Body receive this year?
5. What was the highest temperature in New York City today?
6. What time do most people eat their dinners?
7. Do dogs run faster than cats?
8. What was the difference in rainfall between Singapore and Seattle in 2013?
9. Do math professors get paid less than science professors?
10. Does the most highly paid Literature professor at Harvard get paid more that the most highly paid History professor in MIT?

1.	2.	3.	4.	5.
6.	7,	8,	9.	10.

CHECKED SURVEY

This survey is ready to go! But we need to double check which among them is the appropriate question to be answered statistically. Put a check in the box of your choice.

1. Carly and her friends wanted to explore the time spent by the student-athletes on their training every weekends.

☐ What is the average time spent by a student-athlete during training sessions?

☐ What time did the basketball varsity team arrive at the training session today?

2. Lee is curious about the least favorite subject of 80 6th graders for this school year.

☐ How many 6th graders are enjoying learning about History?

☐ What are the top three subjects that dominate the survey?

3. Henry wants to investigate the prefered time of the students to do studying at home.

☐ How many minutes does a typical student spend in studying?

☐ Do students love studying 6 pm onwards?

NUMBER-CATEGORY CLIPBOARD

The clipboard is ready to identify whether the following variables/data are quantitative or qualitative.

_____1. | The number of papers needed in printing the survey forms.

_____2. | Hours spent in creating survey questions.

_____3. | The brand of paper to be used in producing questionnaires.

_____4. | The socio-economic status of the participants in the study.

_____5. | The age bracket of the sample in the study.

_____6. | The mobile number of the people who will answer the survey.

_____7. | The email addresses of the participants.

TO COUNT OR TO MEASURE

Amateur researchers are about to investigate the data collected on the recent national election. Help them classify whether it falls under discrete or continuous variable.

1. The number of candidates who run for different government positions.

2. The rate of approval given by the citizen to a particular candidate.

3. The total number of voters in each city.

4. The distance of two voting areas from each other.

5. The votes received by a candidate on the election day.

6. The percentage got by the candidate in respect to the total number of votes.

WHEN CONDUCTING SURVEYS

Answer the following questions briefly.

1. In conducting poll or survey, what are the advantages of using sample rather than the entire population?

_____

_____

_____

2. Aside from polls and surveys, give three situations/events where statistical questions are being applied.

_____

_____

_____

3. Is it appropriate to manipulate the collected data of the study just to favor your desire result? Why or why not?

_____

_____

_____

4. Conduct a short and quick survey with five to ten participants about a recent political topic that you have chosen.

_____

_____

_____

ANSWER GUIDE

Activity 1

1. Fact
2. Inferential
3. Sample-population
4. Continuous
Bonus Questions: Mr. Ronald Fisher

Activity 2

1. Collecting
2. Organizing
3. collecting
4. Analyzing
5. Decision-making
6. decision-making

Activity 3

1. I
2. D
3. D
4. D
5. I
6. I
7. D
8. I
9. I
10. D

Activity 4

1. A: 18-20 aged people   B: 100 participants
   C: mobile preference   D: Qualitative   E. N/A
2. A: all of your classmates B: 35 students
   C: favorite book genre   D: Qualitative   E.N/A

Activity 5

Answers may vary.

ANSWER GUIDE

Activity 6

1. :)	2. :)	3. :)	4. :)	5. :(
6. :)	2. :(	3. :(	4. :(	5. :(

Activity 7

1. First option   2. Second option   3.First option

Activity 8

1. Quantitative   2. Quantitative   3. Qualitative
4. Qualitative   5. Quantitative   6 and 7. Qualitative

Activity 9

1. D   2. C   3. D   4. C   5. D   6. C

Activity 10

1. Using sample rather than the entire population can sometime save money, time, and effort. Since sample also contains the characteristics of the population, using it s=is not bad at all.
2. We can use it in weather forecast, estimating values, predicting future values/trend
3. Manipulating data is actually against the principle of conducting surveys. Statistics is used to seek for answers with numerical basis so we should not manipulate the data for our benefit.

Copyright Notice

Thank you

Thank you so much for purchasing and downloading this resource.

We hope it has been useful for you in the classroom and that your students enjoy the activities.

For more teaching and homeschooling resources like this, don't forget to come back and download the new material we add every week!

Thanks for supporting **Helping With Math**. We can provide teachers with low-cost, high-quality teaching and homeschooling resources because of our loyal subscribers and hope to serve you for many years to come.

- The Entire Helping With Math Team :)