WHAT IS A STATISTICAL QUESTION?

**Activity Items**

The following items are part of this activity and appear at the end of this student version.

- Item 1: Radio Set Ownership Map
- Item 2: Map of U.S. Regions and the Land Areas of the 50 U.S. States and District of Columbia

**Student Learning Objectives**

- I will be able to distinguish between statistical questions and other types of questions.
- I will be able to formulate and answer my own statistical questions, drawing conclusions based on those answers.
- I will be able to understand the concept of variability within a data set.
A statistical question is a question that can be answered by collecting data that vary. For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question. This is because to answer the second question, you would need to determine the ages of all students in your school and there would be variability in those data (since not all students are the same age).

**Part 1 – Determine If Questions Are Statistical**

Imagine you want to find out about the height of students in your class using statistics. Read each question below and decide if it is a statistical question. Then explain your answer.

<table>
<thead>
<tr>
<th>Question</th>
<th>Is it statistical? (Yes/No)</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How tall are you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. How tall, in inches, was Marco on his last birthday?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. How tall are the students in your class, in centimeters?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Is Preston taller than 60 inches?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Part 2 – Look at Data and Statistical Questions

1. Review Item 1: Radio Set Ownership Map, which shows the percentage of families that owned a radio in each U.S. state in 1930, and record any observations about the data.
2. Determine which questions in the table below are statistical and if they could be answered using the data in Item 1. (You don’t have to actually find the answers to the questions!)

<table>
<thead>
<tr>
<th>Question</th>
<th>Is it statistical? (Yes/No)</th>
<th>Could it be answered with data from Item 1? (Yes/No)</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What percentage of families in Florida had a radio set in 1930?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Which region of the United States had the lowest rates of radio set ownership in 1930?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. In 1930, how much did the radio ownership rates for different states vary?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. In 1930, why did a greater percentage of families in California own a radio set compared with families in nearby states?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 3 – Write Your Own Statistical Questions

Use Item 2: Map of U.S. Regions and the Land Areas of the 50 U.S. States and District of Columbia, where states are listed in order from largest to smallest area, to complete the following prompts:

- Write three statistical questions that you could answer using data from Item 2.
- Use data from Item 2 to actually answer each question.
- Explain how you found each answer.
- Draw a conclusion about what your answer means for the larger data set.
- Write a related question for each of your statistical questions (but don’t answer this one).

**Example**

**Question:** How do the areas of each of the three states on the West Coast vary?

**Answer:** Washington = 71,298 square miles; Oregon = 98,379 square miles; California = 163,695 square miles

**Explanation:** I found these areas by locating each state in the table.

**Conclusion:** Each of the three states on the West Coast has a different area, ranging from about 71,000 to 164,000 square miles.

**Related Question:** How do the areas of the states on the West Coast compare with the areas of the states on the East Coast?

**Question 1:**

**Answer:**

**Explanation:**

**Conclusion:**

**Related Question:**
Part 4 – Draw Conclusions From a Graph (Optional)

The following graph shows the percentages of people aged 3 and older in the United States who were enrolled in school at different levels — ranging from nursery school (pre-K) to college — from 1955 to 2016.

Distribution of School Enrollment of the U.S. Population 3 Years and Older, by Level: 1955 to 2016

Data on nursery school enrollment not available from 1955 to 1963

Source: U.S. Census Bureau, Current Population Survey

www.census.gov/content/dam/Census/library/visualizations/time-series/demo/school-enrollment/Figure%20A-1_2016.pdf
1. Examine the graph and write down any observations about the data or the graph.

2. Write a statistical question that can be answered using data in the graph, answer your question, explain how you found the answer, and write a concluding statement about your answer:

   **Question:**

   **Answer:**

   **Explanation:**

   **Conclusion:**
Item 2: Map of U.S. Regions and the Land Areas of the 50 U.S. States and District of Columbia

## Item 2: Map of U.S. Regions and the Land Areas of the 50 U.S. States and District of Columbia (Continued)

<table>
<thead>
<tr>
<th>State</th>
<th>Area in Square Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States(^1)</td>
<td>3,796,742</td>
</tr>
<tr>
<td>Alaska</td>
<td>665,384</td>
</tr>
<tr>
<td>Texas</td>
<td>268,596</td>
</tr>
<tr>
<td>California</td>
<td>163,695</td>
</tr>
<tr>
<td>Montana</td>
<td>147,040</td>
</tr>
<tr>
<td>New Mexico</td>
<td>121,590</td>
</tr>
<tr>
<td>Arizona</td>
<td>113,990</td>
</tr>
<tr>
<td>Nevada</td>
<td>110,572</td>
</tr>
<tr>
<td>Colorado</td>
<td>104,094</td>
</tr>
<tr>
<td>Oregon</td>
<td>98,379</td>
</tr>
<tr>
<td>Wyoming</td>
<td>97,813</td>
</tr>
<tr>
<td>Michigan</td>
<td>96,714</td>
</tr>
<tr>
<td>Minnesota</td>
<td>86,936</td>
</tr>
<tr>
<td>Utah</td>
<td>84,897</td>
</tr>
<tr>
<td>Idaho</td>
<td>83,569</td>
</tr>
<tr>
<td>Kansas</td>
<td>82,278</td>
</tr>
<tr>
<td>Nebraska</td>
<td>77,348</td>
</tr>
<tr>
<td>South Dakota</td>
<td>77,116</td>
</tr>
<tr>
<td>Washington</td>
<td>71,298</td>
</tr>
<tr>
<td>North Dakota</td>
<td>70,698</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>69,899</td>
</tr>
<tr>
<td>Missouri</td>
<td>69,707</td>
</tr>
<tr>
<td>Florida</td>
<td>65,758</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>65,496</td>
</tr>
<tr>
<td>Georgia</td>
<td>59,425</td>
</tr>
<tr>
<td>Illinois</td>
<td>57,914</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State</th>
<th>Area in Square Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iowa</td>
<td>56,273</td>
</tr>
<tr>
<td>New York</td>
<td>54,555</td>
</tr>
<tr>
<td>North Carolina</td>
<td>53,819</td>
</tr>
<tr>
<td>Arkansas</td>
<td>53,179</td>
</tr>
<tr>
<td>Alabama</td>
<td>52,420</td>
</tr>
<tr>
<td>Louisiana</td>
<td>52,378</td>
</tr>
<tr>
<td>Mississippi</td>
<td>48,432</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>46,054</td>
</tr>
<tr>
<td>Ohio</td>
<td>44,826</td>
</tr>
<tr>
<td>Virginia</td>
<td>42,775</td>
</tr>
<tr>
<td>Tennessee</td>
<td>42,144</td>
</tr>
<tr>
<td>Kentucky</td>
<td>40,408</td>
</tr>
<tr>
<td>Indiana</td>
<td>36,420</td>
</tr>
<tr>
<td>Maine</td>
<td>35,380</td>
</tr>
<tr>
<td>South Carolina</td>
<td>32,020</td>
</tr>
<tr>
<td>West Virginia</td>
<td>24,230</td>
</tr>
<tr>
<td>Maryland</td>
<td>12,406</td>
</tr>
<tr>
<td>Hawaii</td>
<td>10,932</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>10,554</td>
</tr>
<tr>
<td>Vermont</td>
<td>9,616</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>9,349</td>
</tr>
<tr>
<td>New Jersey</td>
<td>8,723</td>
</tr>
<tr>
<td>Connecticut</td>
<td>5,543</td>
</tr>
<tr>
<td>Delaware</td>
<td>2,489</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>1,545</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>68</td>
</tr>
</tbody>
</table>

\(^1\) Includes all 50 states and the District of Columbia.


*Click on the link above to view the 2010 source data online.*