Unit 8, Lesson 4: Dot Plots

Lesson Goals

- Understand that a data set can be characterized by the center and spread of its distribution.
- Informally describe the center and spread of a distribution represented by a dot plot.
- Interpret dot plots.

Required Materials

4.1: Pizza Toppings (Part 1) (5 minutes)

Setup:

Students in groups of 2. A couple of minutes of partner collaboration, followed by a minute to compare responses with another group.
**Student task statement**

Fifteen customers in a pizza shop were asked, “How many toppings did you add to your cheese pizza?” Their responses are shown in the table.

| 1 | 2 | 1 | 3 | 0 | 1 | 1 | 2 | 0 | 3 | 0 | 0 | 1 | 2 | 2 |

1. Could you use a dot plot to represent the data? Explain your reasoning.

2. Complete the table.

<table>
<thead>
<tr>
<th>number of toppings</th>
<th>frequency (number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Possible responses**

1. Yes. Data on the number of toppings can be shown in a dot plot.

2. See lesson plan.
4.2: Pizza Toppings (Part 2) (10 minutes)

**Setup:** Students in groups of 2. 4–5 minutes of quiet work time, followed by 1–2 minutes of partner discussion.

**Student task statement**

1. Use the tables from the warm-up to display the number of toppings as a dot plot. Label your drawing clearly.

2. Use your dot plot to study the distribution for number of toppings. What do you notice about the number of toppings that this group of customers ordered? Write 2–3 sentences summarizing your observations.

**Possible responses**

1. See lesson plan.

2. Answers vary. Sample response:
   Most customers ordered 0, 1, or 2 toppings. Nobody ordered 4 or more toppings.
Are you ready for more?
Think of a statistical question that can be answered with the data about the number of toppings ordered, as displayed on the dot plot. Then answer this question.

Possible Responses
Answers vary. Sample responses:

- What is the largest number of toppings ordered by the fifteen customers? (3)

- What percentage of the customers in the data set ordered 3 toppings? (About 13%)
4.3: Homework Time (20 minutes)

**Setup:**

Students in groups of 2. 6–7 minutes of quiet work time for the first three questions, 4–5 minutes of partner collaboration on the rest of task, followed by a whole-class discussion.
Student task statement

Twenty-five sixth-grade students answered the question: “How many hours do you generally spend on homework each week?”

1. Why is this question a statistical question?

2. This dot plot shows the number of hours per week that these 25 students reported spending on homework.

   ![](image)

   hours spent on homework per week

   Use the dot plot to answer the following questions. For each, show or explain your reasoning.

   a. What percentage of the students reported spending 1 hour on homework each week?

   b. What percentage of the students reported spending 4 or fewer hours on homework each week?

3. Would 6 hours per week be a good description of the number of hours this group of students spends on homework per week? What about 1 hour per week? Explain your reasoning.

4. What value do you think would be a good description of the homework time of the students in this group? Explain your reasoning.

Possible responses

1. It can be answered by collecting data, and we can expect variability in the data.

2. A. 20% B. 68%.

3. Answers vary. Sample response: 6 hours would not be a good description, because most of the group spent a lot less time. One hour would also not be a good estimate, because nearly all other students spent much more time.

4. Answers vary. Sample response: I would say that a good estimate would be around 3–4 hours, which is in the middle of the set.

5. Answers vary. Sample response: I disagree; most of the data spreads out from 0 to 9 hours.
5. Someone said, “In general, these students spend roughly the same number of hours doing homework.” Do you agree? Explain your reasoning.

**Anticipated misconceptions**

Students may not recall how to find a percentage. Remind them that a percentage can be found if we know the size of a part and that of a whole. If needed, prompt them to determine the size of the entire data set.

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**Lesson Synthesis (5 minutes)**

What does the term "typical" mean? How can you tell what is typical from a dot plot?

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**4.4: Family Size (Cool-down, minutes)**

**Setup:** None.
Student task statement

A group of students was asked, “How many children are in your family?”

The responses are displayed in the dot plot.

Possible responses

1. 20

2. 75%

3. Answers vary. Sample response: A typical number of children for this group of families is around 2, but some families had many more children than others. There are no students with more than 5 children in the family.