IM 9–12 MATH v.1

Unit 1
One-variable Statistics

ALGEBRA 1

Lesson 4

The Shape of Distribution

Illustrative Mathematics®

Kendall Hunt

Learning Goal

Let's explore data and describe distributions.

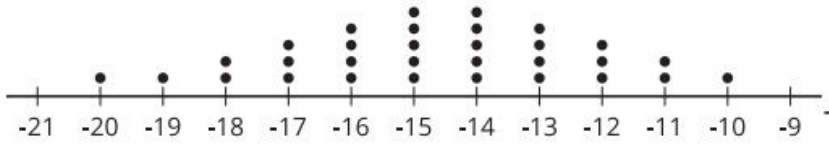
Algebra 1

Which One Doesn't Belong: Distribution Shape

Warm-up: Which One Doesn't Belong?

Which one doesn't belong?

A.



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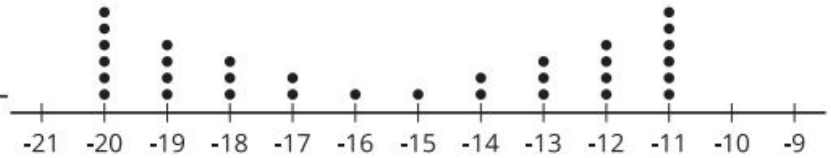

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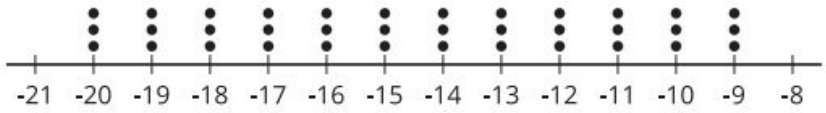

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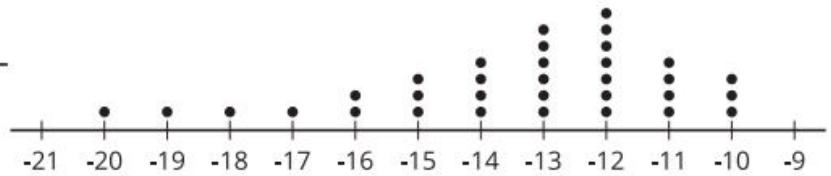


Which One Doesn't Belong: Distribution Shape

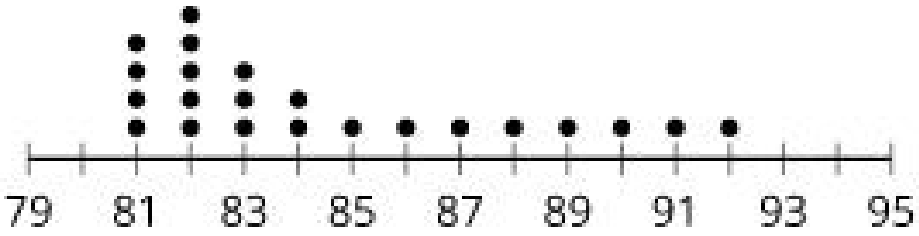
Warm-up: Which One Doesn't Belong?

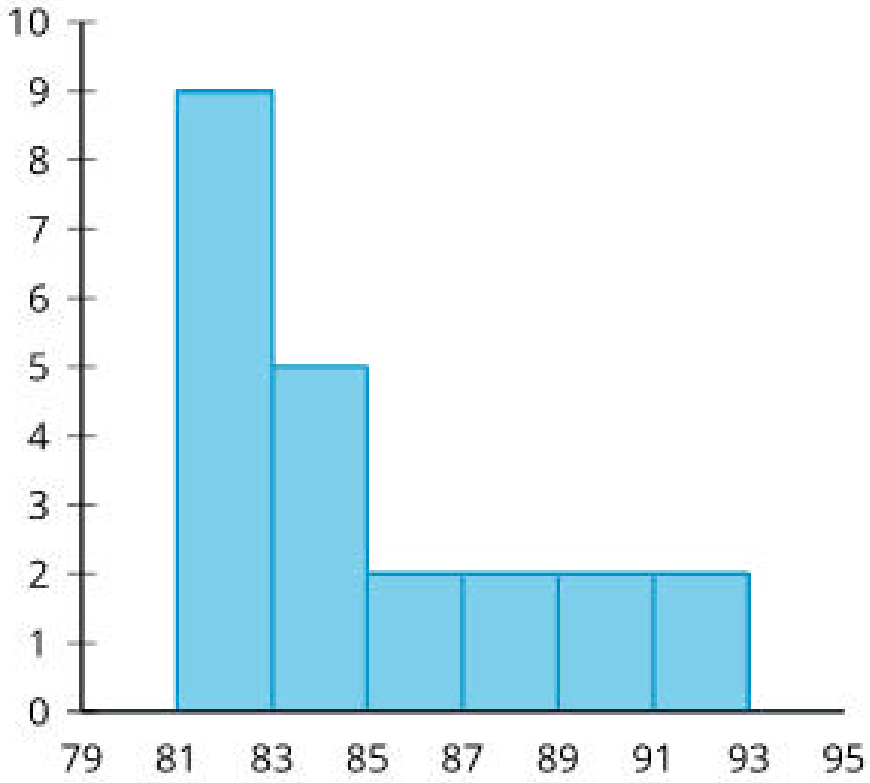
- symmetric
- skewed
- uniform
- bimodal
- bell-shaped

Matching Distribution

What do you notice?

What do you wonder?





Matching Distribution

Take turns with your partner matching 2 different data displays that represent the distribution of the same set of data.

1. For each set that you find, explain to your partner how you know it's a match.
2. For each set that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.
3. When finished with all ten matches, describe the shape of each distribution.

Matching Distribution

- Which matches were tricky? Explain why.
- What vocabulary was useful to describe the shape of the distribution?
- Were there any matches that could be described by more than one of these vocabulary terms?

Where Did The Distribution Come From?

Your teacher will assign you some of the matched distributions. Using the information provided in the data displays, make an educated guess about the survey question that produced this data. Be prepared to share your reasoning.

Where Did The Distribution Come From?

- How did you use the shape of the data to come up with your question?
- Would you always expect your question to result in a [symmetric, skewed, bell-shaped, etc.] distribution?

Where Did The Distribution Come From?

1. How many points did Kiran score in each of his 22 games this season?
2. What were typical low temperatures in a Siberian town during January?
3. On a scale of 1–8, how was the service at the restaurant?
4. How many questions did people get correct on the vocabulary test the first week of school?
5. How many questions did people get correct on the vocabulary test the second week of school?

Where Did The Distribution Come From?

6. How many feet below the surface were each of the core samples taken?
7. How many trees are in my backyard at various temperatures?
8. What was the sum when you spun a spinner labeled 0 to 5 twice?
9. What was the weight of the crystal you grew in chemistry class?
10. How many questions did students get correct on a 10-item matching test?

What have you learned about the distribution now that you can think of the data in a real situation?

Distribution Type

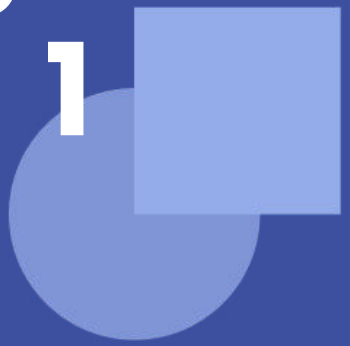
Lesson Synthesis

- What does a symmetric data set look like?
- What does it mean to say that the shape of a distribution is uniform?
- Have you heard of a bell curve before? How does this relate to a bell-shaped distribution?
- What is an example of a context where you would expect to find a bimodal distribution?
- Can a skewed distribution also be symmetric? Why or why not?

- I can describe the shape of a distribution using the terms "symmetric, skewed, uniform, bimodal, and bell-shaped."
- I can use a graphical representation of data to suggest a situation that produced the data pictured.

Learning Targets

Algebra 1



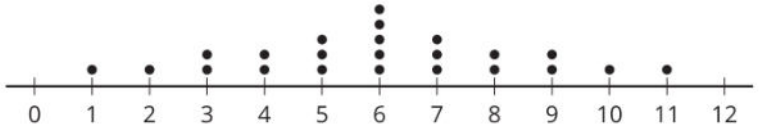
Distribution Types

Cool-down

Describe each of these distributions. If more than one term applies, include all the terms that describe each distribution. Where possible, use the terms:

- symmetric distribution
- skewed distribution
- bell-shaped distribution
- uniform distribution
- bimodal distribution

1.



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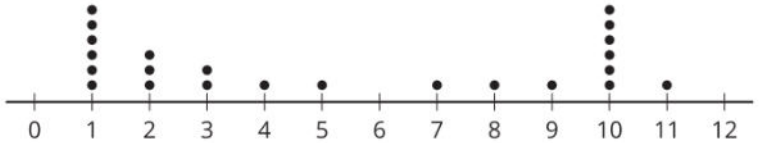

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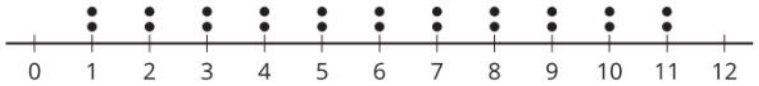
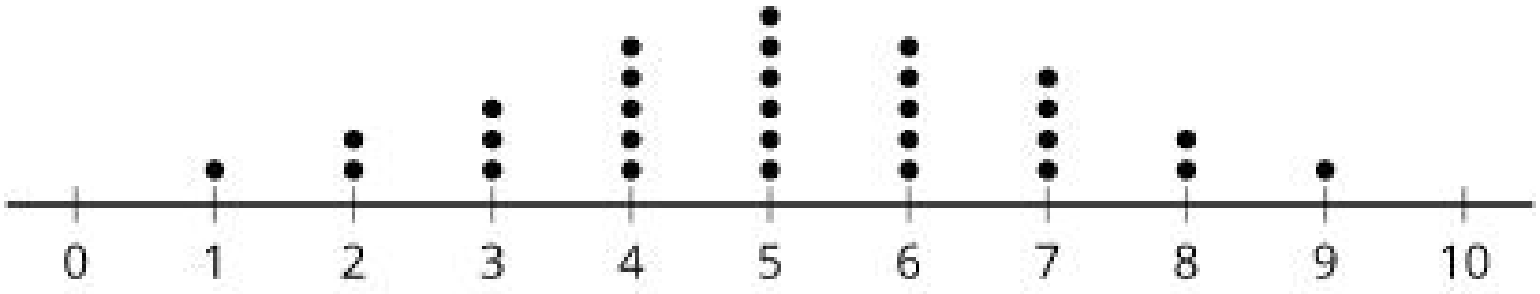


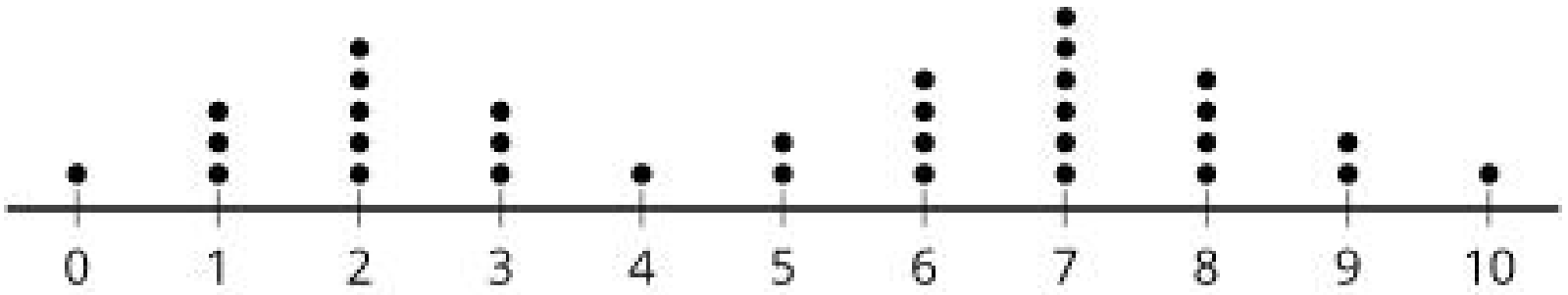
bell-shaped distribution

A distribution whose dot plot or histogram takes the form of a bell with most of the data clustered near the center and fewer points farther from the center.



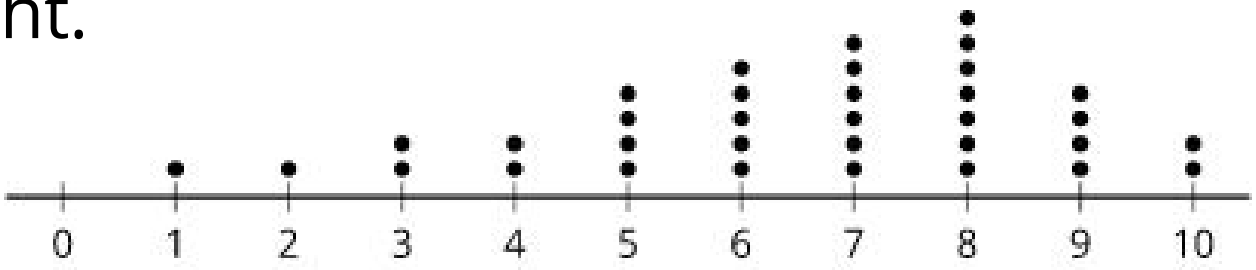
bimodal distribution

A distribution with two very common data values seen in a dot plot or histogram as distinct peaks. In the dot plot shown, the two common data values are 2 and 7,



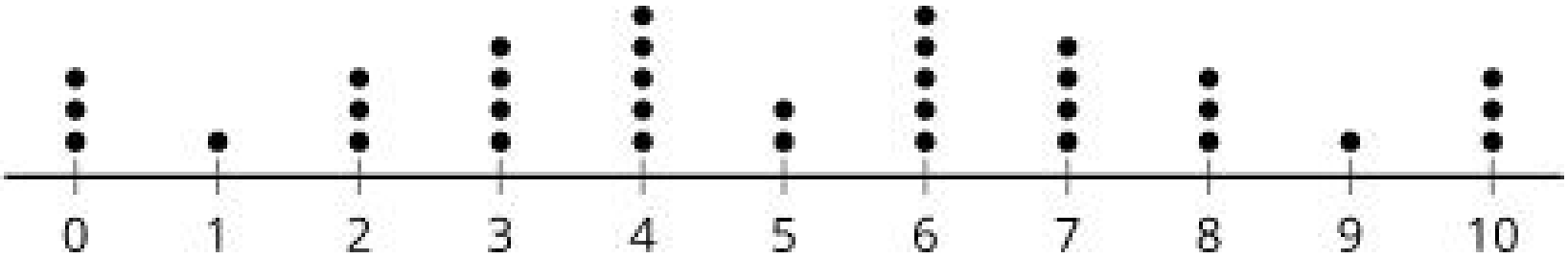
skewed distribution

A distribution where one side of the distribution has more values farther from the bulk of the data than the other side, so that the mean is not equal to the median. In the dot plot shown, the data values on the left, such as 1, 2, and 3, are further from the bulk of the data than the data values on the right.



symmetric distribution

A distribution with a vertical line of symmetry in the center of the graphical representation, so that the mean is equal to the median. In the dot plot shown, the distribution is symmetric about the data value 5.



uniform distribution

A distribution which has the data values evenly distributed throughout the range of the data.