LESSON MAKER PRO

Build the Bell

Use the mean and standard deviation to place a normal curve.

HIGH SCHOOL · A2.D.1.1

A2.D.1.1 "Use the mean and standard deviation of a data set to create a normal distribution (bell-shaped curve)."

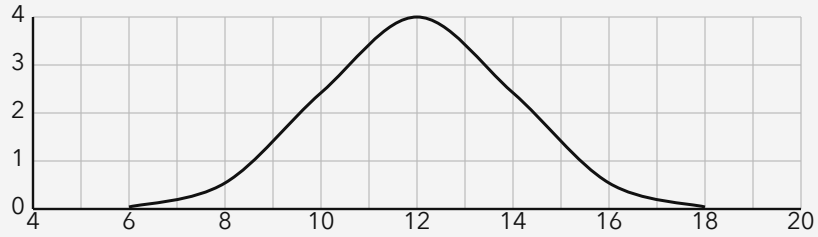
NAME _____ DATE _____

CENTER AND SPACING

A normal curve is symmetric and peaks above the mean. Mark the mean at the center of the x-axis, then use equal steps of one standard deviation (SD) on both sides. Sketch a smooth bell that tapers toward the ends.

WORKED EXAMPLE

A normal model has mean 12 and SD 2. Label the center and the points 1, 2, and 3 SDs from it.



1. Put 12 at the center.
2. Step 2 each way for 1 SD: 10 and 14.
3. Step again for 2 SD: 8 and 16.
4. Step again for 3 SD: 6 and 18.

Answer: From left to right: 6, 8, 10, 12, 14, 16, 18.

PRACTICE 4 problems

1 A normal model has mean 30 and SD 5. List its five x-axis marks from 2 SDs below to 2 SDs above the mean.

ANSWER _____

2 The center mark is 80. The next two marks to its right are 90 and 100. What is the SD? Which mark is 2 SDs below the mean?

ANSWER _____

3 A normal model has mean 50 and SD 4. Find the marks 1 SD below and 3 SDs above the mean.

ANSWER _____

_____

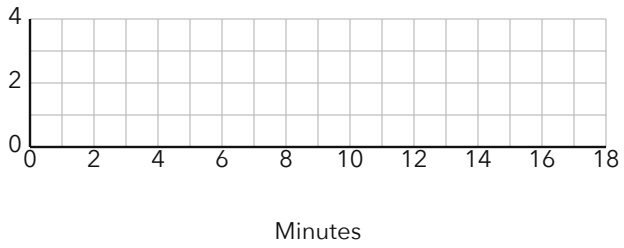
4 A normal model has mean 120 and SD 15. A classmate puts the peak above 135. Where does the peak belong? How many SDs above the mean is 150?

ANSWER _____

_____

APPLY IT Show your work

1 Listening times for a playlist follow a normal model with mean 9 minutes and SD 3 minutes. On the grid, sketch the bell curve. Label the mean and the marks 1, 2, and 3 SDs away on both sides.



ANSWER _____

2 Viewing times for two kinds of clips follow normal models. Which model has the wider curve? Give the marks 1 SD below and above each mean.

CLIP VIEWING TIMES, IN MINUTES

Clips	Mean	SD
Gaming	10	1
Music	10	3

ANSWER _____

CHALLENGE One step up

Five equally spaced marks from 2 SDs below to 2 SDs above a mean are 22, 26, 30, 34, 38. A student says the SD is 8. Explain the error and give the mean and SD.

WORK SPACE AND ANSWER

ANSWER KEY

Build the Bell

HIGH SCHOOL · A2.D.1.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A normal model has mean 30 and SD 5. List its five x-axis marks from 2 SDs below to 2 SDs above the mean.	**20, 25, 30, 35, 40**
2	The center mark is 80. The next two marks to its right are 90 and 100. What is the SD? Which mark is 2 SDs below the mean?	**SD = 10; the mark is 60.**
3	A normal model has mean 50 and SD 4. Find the marks 1 SD below and 3 SDs above the mean.	**46 and 62**
4	A normal model has mean 120 and SD 15. A classmate puts the peak above 135. Where does the peak belong? How many SDs above the mean is 150?	**The peak belongs above 120; 150 is 2 SDs above the mean.**

PART 2 · APPLY IT

1. **A symmetric bell peaks above 9. Its x-axis marks, from left to right, are 0, 3, 6, 9, 12, 15, 18.** Start at 9 and move in steps of 3 minutes in both directions. Place the peak above 9 and taper the curve toward each end.
2. **Music clips have the wider curve. Gaming: 9 and 11 minutes. Music: 7 and 13 minutes.** The larger SD makes the music curve wider. Subtract and add each SD to the shared mean of 10.

CHALLENGE

The mean is 30 and the SD is 4. The student used the distance from 30 to 38, which is 2 SDs, as if it were 1 SD.

Accept x-axis marks listed from right to left when their positions are clear. For the sketch, accept any smooth, symmetric bell centered above 9 with the correct marks.