

East Conference:

$$\bar{x} = \frac{2 + 3 + 4 + 5 + 5 + 5 + 6 + 6 + 8 + 10}{10} = 5.4$$

$\bar{x}$	Deviation from Mean	Square of Deviation from Mean
2	$2 - 5.4 = -3.4$	$(-3.4)^2 = 11.56$
3	$3 - 5.4 = -2.4$	$(-2.4)^2 = 5.76$
4	$4 - 5.4 = -1.4$	$(-1.4)^2 = 1.96$
5	$5 - 5.4 = -0.4$	$(-0.4)^2 = 0.16$
5	$5 - 5.4 = -0.4$	$(-0.4)^2 = 0.16$
5	$5 - 5.4 = -0.4$	$(-0.4)^2 = 0.16$
6	$6 - 5.4 = 0.6$	$0.6^2 = 0.36$
6	$6 - 5.4 = 0.6$	$0.6^2 = 0.36$
8	$8 - 5.4 = 2.6$	$2.6^2 = 6.76$
10	$10 - 5.4 = 4.6$	$4.6^2 = 21.16$

$$11.56 + 5.76 + 1.96 + 0.16 + 0.16 + 0.16 + 0.36 + 0.36 + 6.76 + 21.16 = 48.4$$

$$s = \sqrt{\frac{48.4}{9}} \approx 2.3$$

The mean for the West Conference is **greater** than the mean for the East Conference, and the standard deviation for the West Conference is **greater** than the standard deviation for the East Conference.

Sample answer: The greater mean for the West Conference shows that in general, the point spread is greater in the West Conference. The greater standard variation shows that the point spreads vary more in the West Conference, and the teams are more closely matched in the East Conference.

Sample answer: In the West Conference dot plot, you can see that the dots are more spread out, and in the East Conference dot plot, the dots are more tightly clustered around 5 and 6.

### 3 LESSON PRACTICE

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#### Answer Key

1. B
2. B
3. A
4. D
5. D

6. B

7. 1.4;

$$\frac{15 + 16 + 18 + 17 + 15 + 18 + 14 + 17 + 17 + 14 + 15 + 16}{12} = 16$$

$\bar{x}$	Deviation from Mean	Square of Deviation from Mean
15	-1	1
16	0	0
18	2	4
17	1	1
15	-1	1
18	2	4
14	-2	4
17	1	1
17	1	1
14	-2	4
15	-1	1
16	0	0

$$1 + 0 + 4 + 1 + 1 + 4 + 4 + 1 + 1 + 4 + 1 + 0 = 22$$

$$s = \sqrt{\frac{22}{11}} \approx 1.4$$

8. Oak Seedling Heights; Sample answer: The values are more spread out with a range from 3 to 13. The Maple Seedling Heights are more clustered around the middle and range from 12 to 18.
9. Washington County animal shelter; Sample answer: One standard deviation below the mean is  $38.6 - 12.3 = 26.3$ . About  $50\% - 34\% = 16\%$  of the dogs, or 8 dogs, are less than 26.3 pounds. At the Lake County animal shelter, 2 standard deviations below the mean is  $34.1 - 2(4.9) = 24.3$ . About  $50\% - 47.5\% = 2.5\%$ , or about 1 dog, is less than 24.3 pounds.

10. Part A

Maxwell did not square the deviations from the mean.

For remaining answers, see page LP5.

**LESSON 25**

**Part B**

$$s = \sqrt{\frac{((7-9)^2 + (8-9)^2 + (9-9)^2 + (12-9)^2)}{4-1}} =$$

$$\sqrt{\frac{4+1+0+9}{3}} = \sqrt{\frac{14}{3}} \approx 2.2$$

DOK2

11. No; Sample answer: The mean changes by the constant in the same way that the data elements change, so the deviations from the mean are the same. Since the number of data elements does not change, the standard deviation is also the same.

12. Part A mean:  $(23 + 19 + 14 + 27 + 30 + 22 + 17 + 20) \div 8 = 21.5$

$s =$

$$\sqrt{\frac{1.5^2 + (-2.5)^2 + (-7.5)^2 + 5.5^2 + 8.5^2 + 0.5^2 + (-4.5)^2 + (-1.5)^2}{7}} \approx 5.2$$

Part B

$$\text{mean: } (32 + 16 + 29 + 18 + 24 + 19 + 20 + 26) \div 8 = 23$$

$s =$

$$\sqrt{\frac{9^2 + (-7)^2 + 6^2 + (-5)^2 + 1^2 + (-4)^2 + (-3)^2 + 3^2}{7}} \approx 5.7$$

Part C

The students on bus M have shorter rides on average with less variation than the students on bus N.

Part D

Sample answer: 28, 20, 27, 20, 24, 19, 20, 26; I decreased the greatest element (32) by 4 and increased the smallest element (16) by 4. I also decreased the second greatest element (29) by 2 and increased the second smallest element (18) by 2. Because these changes do not change the sum of the elements, they do not change the mean. However, since they make the data less variable, they decrease the standard deviation.