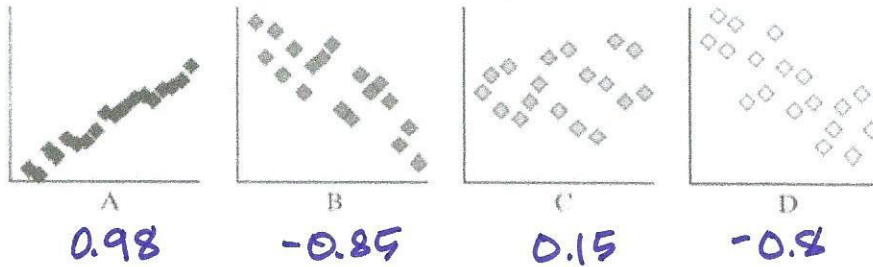Name __Key__   Period _____ Date _____

Investigations 4 and 5 Additional Practice

1. a. Estimate the correlation coefficient of each graph. Assume all graphs are scaled the same.

A	B	C	D
0.98	-0.85	0.15	-0.8

  b. Order the graphs from weakest correlation to strongest correlation.

C, D, B, A

2. The graph shows the results of a survey about the relationship between age and sleep. The graph also shows a model line for the data.

Sleep to Feel Rested
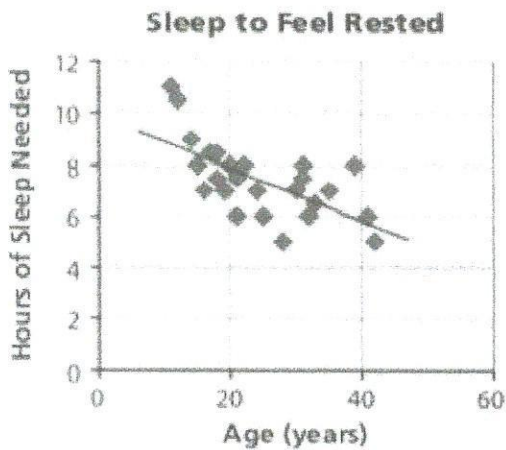
a. Describe in words the relationship between age and the number of hours of sleep needed to feel rested.

As age increases the number of hours of sleep needed to feel rested decreases.

b. Estimate the correlation coefficient for the data. Is it closest to -1, -0.5, 0, 0.5, or 1? Explain your choice. $r = -0.5$

c. Write the equation in y=mx+b form that models this data.

$\frac{\Delta y}{\Delta x} : \frac{6-8}{40-20} = \frac{-2}{20} = \frac{-1}{10}$

$(40,6)$ and $(20,8)$

$y = mx + b$
$y = -0.1x + b$
$6 = -0.1(40) + b$
$6 = -4 + b$
$+4 \quad +4$

$10 = b$

$y = -0.1x + 10$

d. Using your equation calculate how many hours of sleep does a 35 year old need to feel rested?

$y = -0.1x + 10$
$y = -0.1(35) + 10$
$y = -3.5 + 10$

$y = 6.5$

A 35 year old needs 6.5 hours of sleep to feel rested.

e. Can the model be used to predict the number of hours of sleep needed by a person who is 80 years old? Explain your reasoning.

No, the trend is probably not valid much further beyond 40-50 yrs. If it were, an 80 year old would require close to zero hours of sleep.
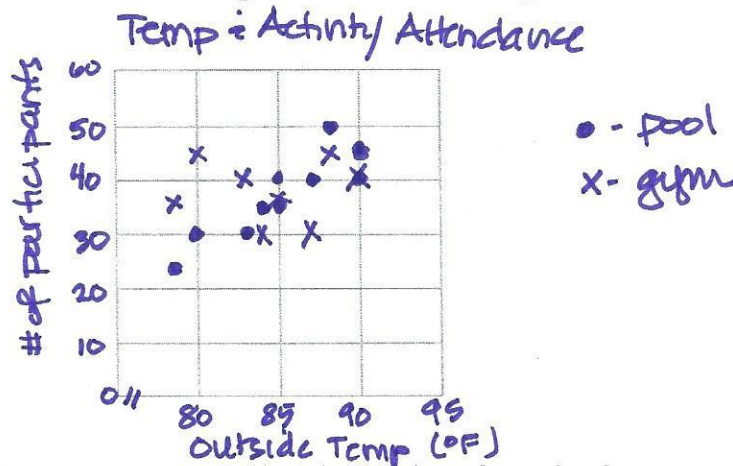
Additional Practice (continued)

A recreation center collected data on the outside temperature and the number of people who participated in each activity. The table shows the data.

Temp. (°F)	83	90	90	87	78	80	84	85	85	87
Swimming Pool	30	40	45	50	24	30	34	34	40	40
Free Gym	40	40	40	45	36	45	30	35	35	30

7. a. Graph the data on a scatter plot. Use two different marks or colors to represent the data for swimming and the data for free gym.

Temp : Activity Attendance

• - pool
x - gym

b. Does the outside temperature affect the number of people who participated in each activity? Explain your answer.

The outside temperature seems to have a positive correlation with the number of people in the pool.

There does not appear to be a relationship between temp. and attendance at the free gym.

c. Suppose you drew one linear model to represent all the data on the graph. Could you use the model and the forecasted high temperature for a given day to predict the number of swimmers who will come on that day? Explain.

It would be better to use just the pool data to create your model. The gym data make the correlation weaker.

Additional Practice (continued)

Use the information in the table for exercises 3 and 4.

The table shows the results of a survey related to the musical preferences of all the students at a middle school.

	Country	Pop	Rock	Other
Sixth Grade	10	12	8	10
Seventh Grade	10	12	12	16
Eighth Grade	15	11	12	8

3. Classify each statement as true or false. Justify your answer.

 a. Seventh graders are more likely to prefer pop music than eighth graders.

 False   12/50 = 24% of 7th graders prefer pop.
       11/46 = 23.9% of 8th graders prefer pop ~ 24%.

 b. It is equally likely that someone who likes country music is in sixth grade as they are in seventh grade.

 True because there are equal numbers of 6th & 7th graders who like country music.

 c. It is less likely that an eighth grader likes pop music than rock music.

 True because fewer 8th graders like pop than rock.

 d. It is equally likely that a sixth grader likes rock music as an eighth grader likes music that is not country, pop, or rock.

 False   8/40 = 20% of 6th graders like rock music
       8/46 = 17.4% of 8th graders like music that is not country, pop or rock

Additional Practice (continued)

The table shows the results of a survey related to the musical
preferences of all the students at a middle school.

	Country	Pop	Rock	Other
Sixth Grade	10	12	8	10
Seventh Grade	10	12	12	16
Eighth Grade	15	11	12	8

4. Complete each table to show the percents represented by the different
   musical preferences. Round to the nearest whole percent if needed.

   a. Percent of students in a **grade level** who like a type of music

	Country	Pop	Rock	Other
Sixth Grade	$\frac{10}{40} = 0.25 = 25\%$	$\frac{12}{40} = .3 = 30\%$	$\frac{8}{40} = 20\%$	$\frac{10}{40} = 25\%$
Seventh Grade	$\frac{10}{50} = 20\%$	$\frac{12}{50} = 24\%$	$\frac{12}{50} = 24\%$	$\frac{16}{50} = 32\%$
Eighth Grade	$\frac{15}{46} = 33\%$	$\frac{11}{46} = 24\%$	$\frac{12}{46} = 26\%$	$\frac{8}{46} = 17\%$

   b. Percent of students who **like a type of music** that are in a certain grade

|	Country	Pop	Rock	Other
Sixth Grade	$\frac{10}{35} \approx 0.29 = 29\%$	$\frac{12}{35} = 34\%$	$\frac{8}{32} = 25\%$	$\frac{10}{34} = 29\%$
Seventh Grade	$\frac{10}{35} = 29\%$	$\frac{12}{35} = 34\%$	$\frac{12}{32} = 38\%$	$\frac{16}{34} = 47\%$
Eighth Grade	$\frac{15}{35} = 43\%$	$\frac{11}{35} = 31\%$	$\frac{12}{32} = 38\%$	$\frac{8}{34} = 24\%$

   c. Percent of **all** students surveyed

	Country	Pop	Rock	Other	Total
Sixth Grade	$\frac{10}{136} = 7\%$	$\frac{12}{136} = 9\%$	$\frac{8}{136} = 6\%$	$\frac{10}{136} = 7\%$	29%
Seventh Grade	$\frac{10}{136} = 7\%$	$\frac{12}{136} = 9\%$	$\frac{12}{136} = 9\%$	$\frac{16}{136} = 12\%$	37%
Eighth Grade	$\frac{15}{136} = 11\%$	$\frac{11}{136} = 8\%$	$\frac{12}{136} = 9\%$	$\frac{8}{136} = 6\%$	34%
Total	25%	26%	24%	25%	100%

## Additional Practice: Digital Assessments

Thinking With Mathematical Models

9. The graph below shows the speeds of some species of ants plotted against their limb length. Decide which of the statements below are true. *Select all that apply*.

Speed vs. Length of limbs
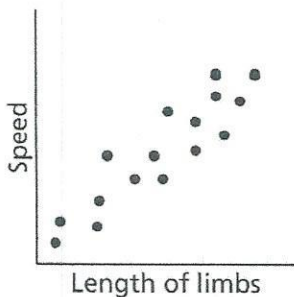
- ☒ The data are positively correlated.
- ☐ The data are inversely correlated.
- ☐ The data are negatively correlated.
- ☐ The correlation coefficient is closest to 1.00.
- ☐ The correlation coefficient is closest to −1.00.
- ☒ The correlation coefficient is closest to 0.50.

10. Order graphs A–D from weakest to strongest correlation.
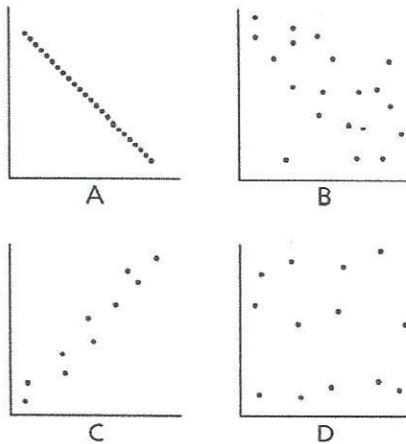
D , B , C , A

11. Consider the data set 16, 12, 18, 2, 6. Circle the terms that make each statement true.

a. The ⎡(mean) median standard deviation⎤ is 10.8.

b. The ⎡mean (median) standard deviation⎤ is 12.

c. The ⎡mean median (standard deviation)⎤ is about 6.72.

Similar to Mean Absolute Deviation

Additional Practice: Digital Assessments

7. Twenty-four students in the 8th grade volunteered to clean up the park on Saturday. There are a total of 40 students in the 8th grade. Which choices represent the students who volunteered to clean up the park? *Select all that apply.*

   ☐ 24%
   ☐ 40%
   ☒ 60%
   ☒ 24 out of 40
   ☐ 16 out of 40
   ☐ $\frac{16}{40}$
   ☐ $\frac{36}{40}$

8. A marching band has 60 students. Of these, 6 play trumpets. Use the tiles to show the fraction of the band that is trumpet players, the fraction in lowest terms, and the equivalent percent. Each tile may be used more than once.

   | 60 | 10 | 95 | 4 |

   | 6 | 15 | 1 | 3 |

   $$\frac{6}{60} = \frac{1}{10} = \boxed{10}\ \%$$

9. This table shows the results of a survey of favorite colors among the 7th- and 8th-grade students.

	Blue	Red	Green	Orange
7th grade	5	7	10	3
8th grade	4	11	8	2

   The table shows the percentages of each grade that chose each color. Use the values in the bank to complete the table.

   | 28% | 24% | 36% | 16% | 40% | 4% | 8% | 32% |

	Blue	Red	Green	Orange
7th grade	20%	28%	40%	12%
8th grade	16%	44%	32%	8%