

CAHSEE Math Problem of the Day -- Week 3

Teacher Notes

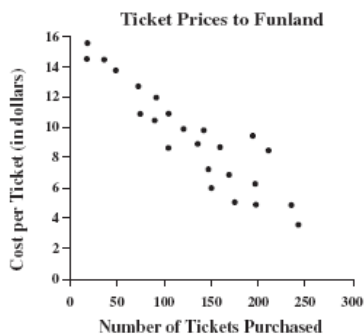
Week & Day	Week 3 – Day 1
Concept/Skill	Scatterplot
Standards	7.SP:1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). 7.AF:1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. 7.MR:2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
Materials	CAHSEE Math Released Items # 57, #58

Overview

Students will review scatterplots and correlations this week. This week will provide students with a quick review of the vocabulary, methods for determining if a correlation is positive, negative, constant, or doesn't exist, and some practice problems from the CAHSEE released items.

Day 1

- **Review** the parts of a scatterplot: x-axis, y-axis, points (dots) which are related to both the x-axis and y-axis.
- **Have students review** Steps to answer Scattergram questions:
 1. Determine what the question is asking.
 - **Increase** means the “dots” slant **up**
 - **Decrease** means the “dots” slant **down**
 - **Unchanged** means the “dots” are **level**
 - **No relationship** means the “dots” **don't make a line**
 2. Look at each choice and use the graph to determine if the statement is true or false. Cross off any statements that are false.



57. The cost of a ticket to Funland varies according to the season. Which of the following conclusions about the number of tickets purchased and the cost per ticket is best supported by the scatterplot above?
- A The cost per ticket increases as the number of tickets purchased increases.
 - B The cost per ticket is unchanged as the number of tickets purchased increases.
 - C The cost per ticket decreases as the number of tickets purchased increases.
 - D There is no relationship between the cost per ticket and the number of tickets purchased.

- **Have students do the guided practice on Day 1** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet.
- Determine if each answer is true or false.**
The dots slant up which means the cost increases so
“A” is True or X False
“B” is True or X False
“C” is X True or False
“D” is True or X False
ANSWER: The correct answer is C.

- **Have students do the CAHSEE released test item on Day 1** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet. (See next page)

CAHSEE Math Problem of the Day -- Week 3

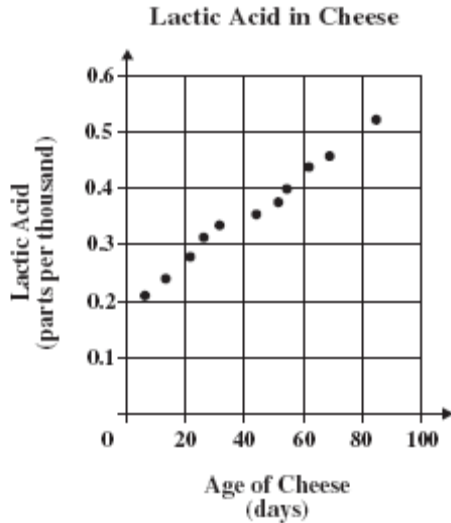
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Have students do the CAHSEE released test item on Day 1 of the student CAHSEE Math Problem of the Day -- Week 3 worksheet.

Day 1

(CAHSEE Math Released Item #58)

58. The scatterplot below shows the time cheese has been aging and the amount of lactic acid present in the cheese.



ANSWER:

Since the points go up there is a positive correlation. As the age of the cheese increases the amount of Lactic Acid increases.

The correct ANSWER is A

Which statement is MOST strongly supported by the scatterplot?

- A** The longer cheese ages, the more lactic acid is present.
- B The longer cheese ages, the less lactic acid is present.
- C The amount of lactic acid present remains constant as cheese ages.
- D No relationship exists between the time cheese ages and the amount of lactic acid present.

CAHSEE Math Problem of the Day -- Week 3

Teacher Notes

Week	Week 3 – Day 2
Concept/Skill	Quantitative Relationships
Standard	7.SP:1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). 7.AF:1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. 7.MR:2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
Materials	CAHSEE Math Released Items #68, #69

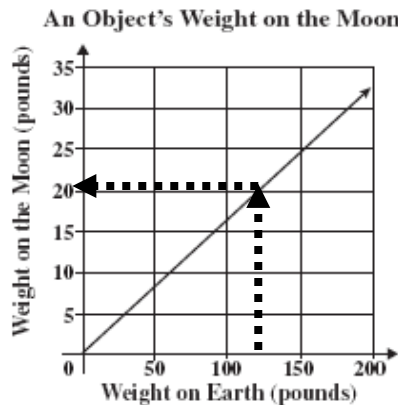
Day 2

Review that today they will answer questions that have a graph and ask you to compare the data found on the x-axis to the data found on the y-axis. Remind students to always look at the labels on the graph.

Have students review Steps to answer Quantitative Relationship questions:

1. These questions ask you to compare the relationship between the data on the **x-axis** (bottom) and **y-axis** (side).
2. To find the answer **draw a straight line up from the point on the x-axis** to the line that shows the correlation.
3. Then draw a **straight line horizontally across to the y-axis** to find the answer. There will only be one correct choice.

68. The graph below compares the weight of an object on Earth to its weight on the Moon.



What is the approximate weight on the Moon of an astronaut who weighs 120 pounds on Earth?

- A 15 pounds
- B 20 pounds
- C 25 pounds
- D 30 pounds

▪ **Have students do the guided practice on Day 2** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet.

1. Draw a straight line up from the x-axis to the line that shows the correlation. The line should start between 100 and 150.
2. Draw a straight line horizontally across from the correlation line to the y-axis.
3. The answer is where the line crosses the y-axis.

ANSWER: The weight of a 120 man on the earth is 20 pounds on the moon.

The correct answer is B

▪ **Have students do the CAHSEE released test item on Day 2** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet. (see next page)

CAHSEE Math Problem of the Day -- Week 3

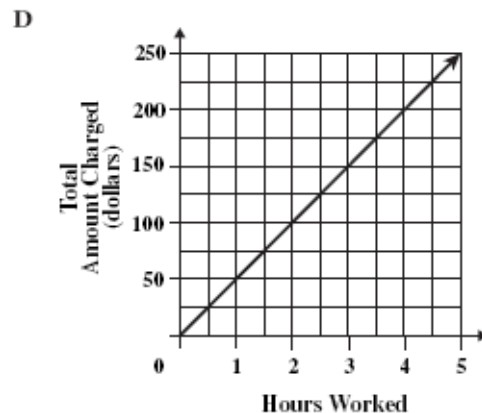
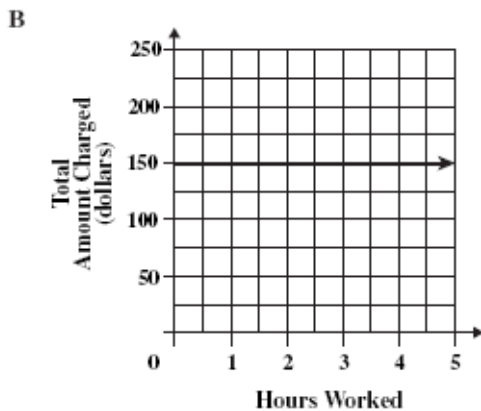
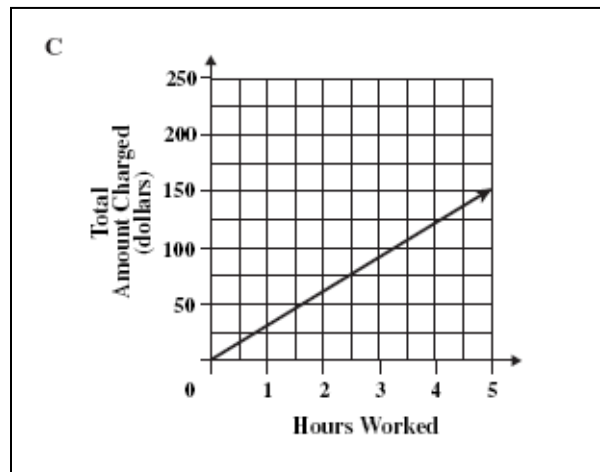
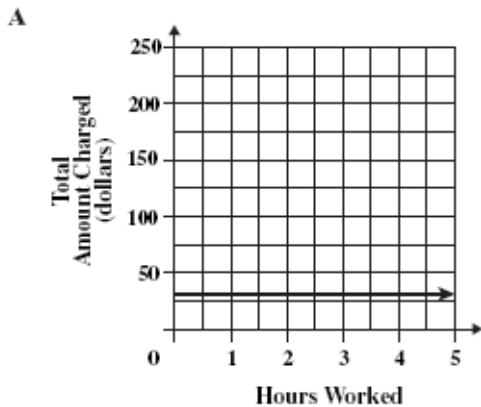
Teacher Notes

Have students do the CAHSEE released test item on Day 2 of the student CAHSEE Math Problem of the Day -- Week 3 worksheet.

In the problem below students need to determine which graph shows the relationship between hours worked and money made. Remind student that the longer Amy works the more money she makes.

- Since this is a positive correlation the line should slant upward because the longer Amy works the more money she makes. **Answers A and B can be eliminated**
(Note: students should be careful to look for the “letter” of the answer since these are in columns and not going across).
- Both C and D show positive correlations so now students need to decide which is correct. This can be done by figuring out the amount of money earned for 5 hours ($\$30 \times 5 = \150). The graph for C shows that at 5 hours the amount charged is \$150 so answer C is correct.

69. Amy works as a computer consultant. She charges \$30 per hour for her work. Which graph shows the relationship between the number of hours Amy works and the amount of money she charges for her work?



CAHSEE Math Problem of the Day -- Week 3

Teacher Notes

Week	Week 3 – Day 3
Concept/Skill	Graphs with 2 correlations
Standard	7.SP:1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). 7.AF:1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. 7.MR:2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
Materials	CAHSEE Math Released Items #66, #67

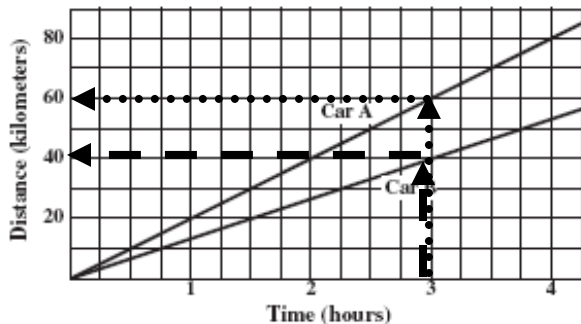
Day 3

- **Review** how to interpret graphs that show a correlation. Find the point on the x-axis where you need to start then draw a line up to the line that shows the correlation and then over to the y-axis to find the answer. Tell students that a graph could show a correlation for two different types of the same thing (ie two types of cars)

Have students review how to Interpret quantitative relationship questions when comparing two items

1. Find the answer for the first item.
2. Find the answer for the second item.
3. Subtract to find the difference.

- **Have students do the guided practice on Day 3** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet.



66. After three hours of travel, Car A is about how many kilometers ahead of Car B?

- A 2
- B 10
- C 20
- D 25

Steps to find the answer:

1. The x-axis shows the Time and the y-axis shows the Distance.
2. Draw a vertical line up from the x-axis at the 3 hour point to Car A. Then draw a line over to the y-axis. Car A went 60 miles.
3. Draw a vertical line up from the x-axis at the 3 hour point to Car B. Then draw a line over to the y-axis. Car B went 40 miles.
4. The difference between Car A and Car B is 60 miles - 40 miles = 20 miles

ANSWER: The correct answer is C.

- **Have students do the CAHSEE released test item on Day 3** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet. (See next page)

CAHSEE Math Problem of the Day -- Week 3

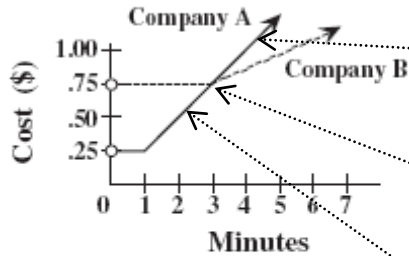
Teacher Notes

Have students do the CAHSEE released test item on Day 3 of the student CAHSEE Math Problem of the Day -- Week 3 worksheet.

Day 3

(CAHSEE Math Released Item #67)

67. The cost of a long distance call charged by each of two telephone companies is shown on the graph below.



Company A is less expensive than Company B for

- A all calls.
- B 3 minute calls only.
- C calls less than 3 minutes.
- D calls longer than 3 minutes.

ANSWER:

Students can tackle this problem by looking at each answer and determining if it is true or false:

A is FALSE since some of the calls are more than 3 minutes and those are more expensive for Company A than Company B.

B is FALSE since at 3 minutes the price is the same for both Company A and Company B

C is TRUE since calls that are less than 3 minutes are less expensive for Company A than Company B.

D is FALSE since calls longer than 3 minutes are more expensive for Company A than company B.

The correct answer is C.

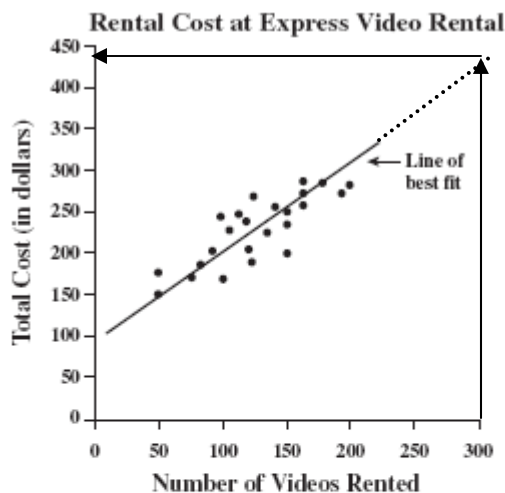
CAHSEE Math Problem of the Day -- Week 3

Teacher Notes

Week	Week 3 – Day 4
Concept/Skill	Drawing the best fit line for a correlation
Standard	7.SP:1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). 7.AF:1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. 7.MR:2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
Materials	CAHSEE Math Released Items #144, #145

Day 4

- **Orally quiz** the students to see if they can recall how to interpret a correlation. Tell students that sometimes they will need to extend the line or even draw the line that best fits the correlation. The line needs to be straight and pass through the center of the points.
- Go over the Steps to answer correlations that are past the best fit line
 1. If there is no line or the line does not continue far enough you will need to finish drawing the line. Be sure to **keep the line straight**.
 2. From the x-axis draw a vertical line up to the line that shows the correlation.
 3. From the correlation line draw a horizontal line to the y-axis to determine the answer.



▪ **Have students do the *SDCOE CAHSEE Prep test item on Day 4* of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet.**

1. The correlation line does not go far enough to determine the price for 300 videos. Draw a straight line that is at the same angle.
2. Draw a line up from 300 on the x-axis to the line you drew for the correlation.
3. Draw a line over to the y-axis to find the price. Note: the price is a Total so determine the price per video students will need to divide the Total by the Number of Videos ($\$450/300=\1.50)

144. Using the line of best fit shown on the scatterplot above, which of the following best approximates the rental cost per video to rent 300 videos?

- A \$3.00
- B \$2.50
- C \$2.00
- D \$1.50**

The ANSWER is D.

Have students do the *CAHSEE released test item on Day 4* of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet. (See next Page)

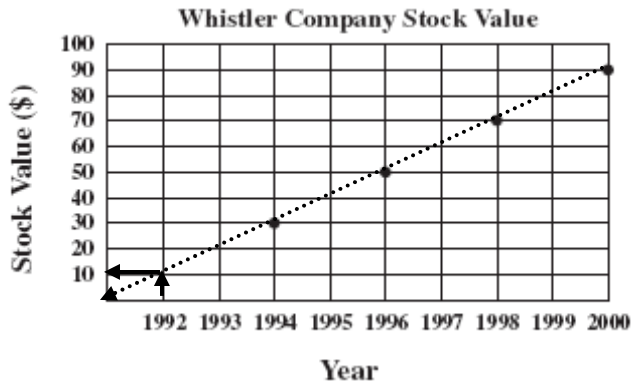
CAHSEE Math Problem of the Day -- Week 3

Teacher Notes

Have students do the CAHSEE released test item on Day 4 of the student CAHSEE Math Problem of the Day -- Week 3 worksheet.

Day 4 (CAHSEE Math Released Item #145)

145. The graph below shows the value of Whistler Company stock at the end of every other year from 1994 to 200.



From this graph, which of the following was the most probable value of Whistler Company stock at the end of 1992?

- A -\$10
- B \$1
- C \$10**
- D \$20

Steps to solve the problem:

1. Students need to draw a line that best fits the data and make sure the line extends all the way to the x-axis. Be sure the line passes through the data points provided.
2. Once the line is there then the problem is just like the other correlation problems. Draw a line up from 1992 to the correlation line and then over to the y-axis to determine the Stock Value. The value of the stock in 1992 was most probably \$10.

ANSWER: C

CAHSEE Math Problem of the Day -- Week 3

Teacher Notes

Week	Week 3 – Day 5
Concept/Skill	Correlations: Positive, Negative, Unchanged, No Relationship
Standard	<p>7.SP:1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level).</p> <p>7.AF:1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.</p> <p>7.MR:2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.</p>
Materials	CAHSEE Math Released Item #56

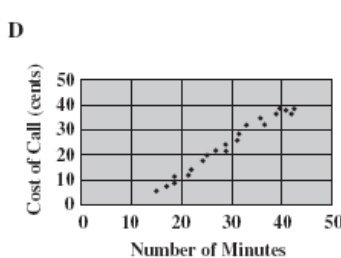
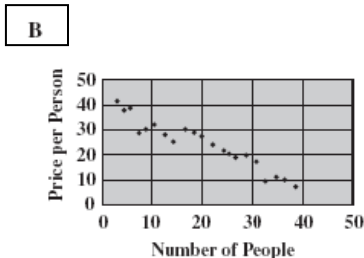
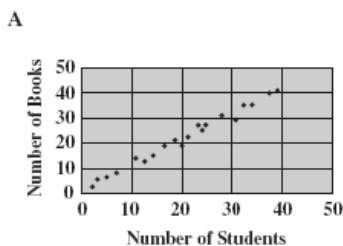
Day 5

- Students will use different vocabulary for this question.
- Review the following:
 - Positive means an increase
 - Negative means a decrease
- Students also need to recognize a graph that show an unchanged correlation (neither positive nor negative but the points do line up)
- Students also need to recognize that a graph with points scattered all over it shows there was no relationship between the variables.
- **Have students do the CAHSEE released test item on Day 5** of the student *CAHSEE Math Problem of the Day -- Week 3* worksheet.

Day 5 (CAHSEE Math Released Item #56)

Note: It doesn't matter what is on the x-axis and y-axis since the question is only referring to the type of correlation.

56. Which scatterplot shows a negative correlation?



Both A and D show a positive correlation so they are not correct.

In graph C the dots are scattered and don't form a line so there is no correlation.

In graph B the dots make a line that slopes down so it shows a Negative Correlation

ANSWER: B

- **At the end of the week remind students to keep the student *CAHSEE Math Problem of the Day -- Week 3* worksheet to use as a study guide as they continue to prepare for the CAHSEE.**