

A graphic of a signpost with a vertical pole and a horizontal sign. The sign has the text 'SCALE CITY' on it. Below the sign is a smaller sign with the 'KET' logo.

SCALE CITY

KET

The Road to Proportional Reasoning: Sky-View Drive-In Handouts

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KEY: SKY-VUE DRIVE-IN: HANDOUT 1

Scale City Drive-In Projector Shadows

Teacher Tip:

Because the interactive simulation “Drive-In Shadow Puppets” reflects the inexact nature of measuring shadows, the k values obtained by multiplying x times y are approximately the same, not exactly the same. This is likely the kind of results students would get if they were actually measuring the shadows. You might ask them why they think the interactive was designed this way. This could lead to a discussion of the difficulty of obtaining perfect numbers when dealing with inexact measurements.

A. Complete the chart below, based on data from “Drive-In Shadow Puppets,” the interactive at the Sky-Vue Drive-In page at www.scalecity.org.

x = Distance of subject from a movie projector (ft)

y = Height of shadow (ft)

k = Value of $x \cdot y$ (k represents a constant, that is a number that doesn't change)

	Lily (5 ft.)	k_1	Kelli (6 ft)	k_2	Jax (3 ft)	k_3
x	y_1	$x \cdot y_1$	y_2	$x \cdot y_2$	y_3	$x \cdot y_3$
10	19.4	194	23.3	233	11.6	116
15	12.9	193.5	15.5	232.5	7.8	117
20	9.7	194	11.6	232	5.8	116
30	6.5	195	7.8	234	3.9	117

B. C. D.

Students can sharpen their graphing skills by creating a graph using the dimensions of the chart. The intervals are the same as those in the interactive, so the graph the students create should look similar to the graph on the interactive.

Questions for Discussion:

- How does the distance from the light influence the height of the shadow?
- How does the x value influence the y value?
- A direct proportion is represented by x/y is equal to k . An inverse proportion is such that x times y is equal to k . Do these numbers indicate a direct or an inverse proportion? Explain. **Note to teacher:** Some students will need to be taught that x/y is a way to represent a ratio, a fraction, and also a way to indicate division.

SKY-VUE DRIVE-IN: HANDOUT 2

Inverse Proportion

Name: _____

Date: _____

A teacher sets up a demonstration using a classroom movie projector and a four-inch doll. Based on the data in the table below, determine the missing measurements. Then use the data to complete the multiple-choice questions.

x (Doll's distance from light)	y (Height of doll's shadow)
15 inches	17 inches
20 inches	_____ inches
25 inches	10 $\frac{1}{5}$ inches
30 inches	_____ inches
35 inches	7 $\frac{2}{7}$ inches
40 inches	_____ inches

- The best estimate for the height of the shadow at 20 inches from the light is
 - 17.45 inches
 - 15.85 inches
 - 12 $\frac{3}{4}$ inches
 - 10 $\frac{3}{4}$ inches
- As the value of x increases,
 - the value of y remains constant
 - the value of y increases
 - the value of y decreases
 - the value of y doubles
- This problem shows a relationship between x and y called
 - a direct proportion
 - a scale factor
 - a multiplication factor
 - an inverse proportion
- A way to explain this relationship where k is a constant is
 - $x/y = k$
 - $x \cdot y = k$
 - $x + y = k$
 - $x - y = k$

Inverse Proportion

- 5.** If the doll were moved to 40 inches from the light, then a good estimate for the height of the shadow would be
- A. 8.454 inches
 - B. 7.106 inches
 - C. $6\frac{3}{8}$ inches
 - D. 5.435 inches
- 6.** When the doll is 30 inches from the light, the height of the shadow would be
- A. $9\frac{7}{8}$ inches
 - B. 8.5 inches
 - C. 7.745 inches
 - D. $7\frac{1}{2}$ inches
- 7.** When comparing the height of the doll's shadow at 15 and 30 inches from the light, it's true that
- A. the height of the shadow doubles as the distance from the light is doubled
 - B. the height of the shadow quadruples as the distance from the light is doubled
 - C. $15/30$ is equal to the ratio of shadows at those distances
 - D. the height of the shadow is halved as the distance is doubled
- 8.** Compare the values of y when x is 20 and 40. It is true that
- A. when the value of x is doubled, the value of y is also doubled
 - B. when the value of x is doubled, the value of y does not change
 - C. when the value of x is doubled, the value of y increases by 4 times
 - D. when the value of x is doubled, the value of y is halved
- 9.** A good way to determine what the doll's shadow would be at 40 inches from the light is to
- A. divide the doll's actual height by the distance from the light
 - B. divide 255, the constant, by 40, the distance from the light
 - C. multiply 40, the distance, by the height of the doll
 - D. multiply 40, the distance, by the height of the shadow at 35 inches
- 10.** The constant value of $x \cdot y$ is the value of the
- A. distance from the light times the height of the shadow = 255
 - B. distance from the light times the height of the doll = 60
 - C. distance from the wall times the height of the doll = 210
 - D. height of the doll divided by height of the shadow = 0.45

KEY: SKY-VUE DRIVE-IN: HANDOUT 2

Inverse Proportion

A teacher sets up a demonstration using a classroom movie projector and a four-inch doll. Based on the data in the table below, determine the missing measurements. Then use the data to complete the multiple-choice questions.

x (Doll's distance from light)	y (Height of doll's shadow)
15 inches	17 inches
20 inches	$12 \frac{3}{4}$ inches or 12.75 inches
25 inches	$10 \frac{1}{5}$ inches
30 inches	$8 \frac{1}{2}$ inches or 8.5 inches
35 inches	$7 \frac{2}{7}$ inches
40 inches	$6 \frac{3}{8}$ inches or 6.375 inches

Answer Key

1. C, 2. C, 3. D, 4. B, 5. C, 6. B, 7. D, 8. D, 9. B, 10. A

SKY-VUE DRIVE-IN: HANDOUT 3

Practice Problems

Name: _____

Date: _____

1. You are on a car trip. The faster the car is driven, the less time it takes to get to your destination. This is an example of a(n) _____ proportion.
2. If your family adopts three cats instead of one, the amount of cat food needed will increase. This is an example of a(n) _____ proportion.
3. In the following chart, what would be the value of y when $x = 20$?

x	y
5	40
10	20
15	13 $\frac{1}{3}$
20	

4. Is this an example of an inverse or direct proportion? Why?
5. What is the value of y when $x = 6$?

x	y
2	8
4	16
6	
8	32

6. Is this an example of an inverse or direct proportion? Why?
7. When Kate was 8 feet from the projector, her shadow was 15 feet tall. How tall will Kate's shadow be when she is 12 feet from the projector?

Practice Problems

8. Nate is painting his bedroom. It took him an hour to paint one wall. His two best friends come to help. If the walls all have the same surface area and all the boys work at the same rate, how long will it take the three friends to finish painting the other three walls in his room?

9. The pep club is paying Andrea and two of her friends to pick up trash after the football games to raise money for a school trip. It usually takes them 30 minutes. If one friend is sick, estimate how long it will take Andrea and her other friend to do the job. Assume that the variables (e.g., the amount of trash and the speed with which Andrea and her remaining friend work) stay the same.

10. Two high school students mow lawns to save money for college. Together they own one lawn mower and take turns. They charge by the square foot. This summer, they want to make more money. They plan to buy another lawn mower. Complete the chart based on the information given.

Number of Mowers	Square Feet	Time	Price Per Square Foot	Square Feet x Price Per Square Foot	Cost Per Job
1	2000	1 hour	\$0.01		
2	2000		\$0.01		
1	2500		\$0.01		
2	2500		\$0.01		
1	5000		\$0.01		
2	5000		\$0.01		

KEY: SKY-VUE DRIVE-IN: HANDOUT 3

Practice Problems

1. You are on a car trip. The faster the car is driven, the less time it takes to get to your destination. This is an example of a(n) **inverse** proportion.

2. If your family adopts three cats instead of one, the amount of cat food needed will increase. This is an example of a(n) **direct** proportion.

3. In the following chart, what would be the value of y when $x = 20$? *10*

x	y
5	40
10	20
15	13 $\frac{1}{3}$
20	10

4. Is this an example of an inverse or direct proportion? Why?

Inverse proportion, since x increases as y increases. $x \cdot y = 200$. In the table, 200 is a constant product of x times y .

5. What is the value of y when $x = 6$? *24*

x	y
2	8
4	16
6	24
8	32

6. Is this an example of an inverse or direct proportion? Why?

Direct proportion. $x/y = k$, $k = 0.25$. As x increases, y increases.

7. When Kate was 8 feet from the projector, her shadow was 15 feet tall. How tall will Kate's shadow be when she is 12 feet from the projector? *10 feet tall*

KEY: Practice Problems

8. Nate is painting his bedroom. It took him an hour to paint one wall. His two best friends come to help. If the walls all have the same surface area and all the boys work at the same rate, how long will it take the three friends to finish painting the other three walls in his room? *One hour*

9. The pep club is paying Andrea and two of her friends to pick up trash after the football games to raise money for a school trip. It usually takes them 30 minutes. If one friend is sick, estimate how long it will take Andrea and her other friend to do the job. Assume that the variables (e.g., the amount of trash and the speed with which Andrea and her remaining friend work) stay the same. *45 minutes*

10. Two high school students mow lawns to save money for college. Together they own one lawn mower and take turns. They charge by the square foot. This summer, they want to make more money. They plan to buy another lawn mower. Complete the chart based on the information given.

Number of Mowers	Square Feet	Time	Price Per Square Foot	Square Feet x Price Per Square Foot	Cost Per Job
1	2000	1 hour	\$0.01	2000×0.01	\$20.00
2	2000	30 minutes	\$0.01	2000×0.01	\$20.00
1	2500	1 1/4 hours or 1.25 hours	\$0.01	2500×0.01	\$25.00
2	2500	0.625 or 37.5 min. or 5/8 hour	\$0.01	2500×0.01	\$25.00
1	5000	2 1/2 hours or 2.5 hours	\$0.01	5000×0.01	\$50.00
2	5000	1 1/4 hours or 1.25 hours	\$0.01	5000×0.01	\$50.00

SKY-VUE DRIVE-IN: HANDOUT 4

Enrichment: Does Movie Projector Math Work at Home?

Name: _____

Date: _____

Twins George and Pam wanted to figure out if it was true that shadows from a movie projector are inversely proportional to the distance from the projection light. Using a home movie projector, they used dolls and action figures to find the answer. They placed a measuring tape in a straight line from the movie projector to the wall. They put the action figures and dolls on a toy truck. They measured different figures' shadows at the distances of 30, 34, 40, 50, and 58.5 inches from the light. Pam measured, and George created a chart. Use the chart to answer the questions and create a graph.

x = the distance of the object from the light source of the projector

y = the height of the shadow of the figure

$x \cdot y = k$ (the constant, which should be the same number for each figure)

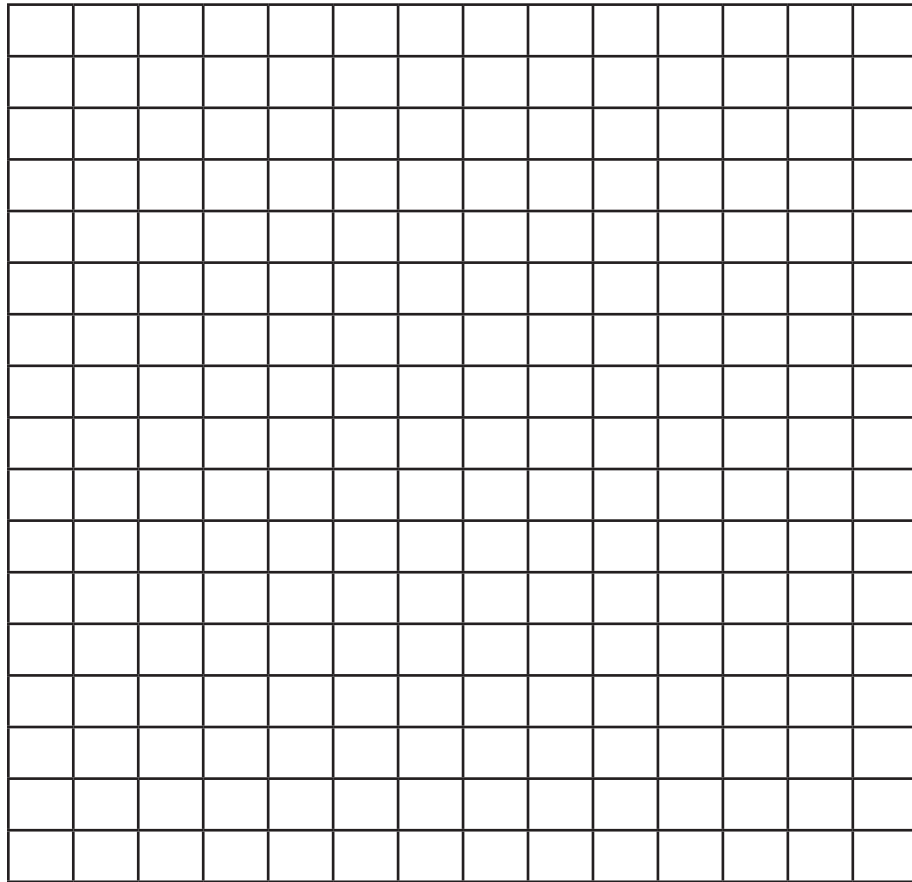
x	Height of 3.5-inch figure's shadow y_1	$x \cdot y$	Height of 4-inch figure's shadow y_2	$x \cdot y$	Height of 7-inch figure's shadow y_3	$x \cdot y$
30 in	7		9		15	
34 in	5.75		8		13.25	
40 in	5.25		6.75		11.25	
50 in	4.75		5		9	
58.5 in	3.75		4.75		7.75	
Range of $x \cdot y$		_____ low _____ high		_____ low _____ high		_____ low _____ high

1. What consistently happens to the value of y as x increases?
2. Complete the columns which calculate $x \cdot y$. Give the ranges in the bottom row.
3. Which figure produced the most consistent values for $x \cdot y$?

Enrichment: Does Movie Projector Math Work at Home?

4. What would you recommend George and Pam do to evaluate the accuracy of their measurements?

5. Draw a simple graph with lines representing the height of the shadows for each size doll (y_1, y_2, y_3) vs. the distances ($x = 30, 34, 40$, etc.). Determine an appropriate scale for each axis and number them accordingly. Label the x - and y -axes and title the graph. You can use different colors to represent each doll.



KEY: SKY-VUE DRIVE-IN: HANDOUT 4

Enrichment: Does Movie Projector Math Work at Home?

Twins George and Pam wanted to figure out if it was true that shadows from a movie projector are inversely proportional to the distance from the projection light. Using a home movie projector, they used dolls and action figures to find the answer. They placed a measuring tape in a straight line from the movie projector to the wall. They put the action figures and dolls on a toy truck. They measured different figures' shadows at the distances of 30, 34, 40, 50, and 58.5 inches from the light. Pam measured, and George created a chart. Use the chart to answer the questions and create a graph.

x = the distance of the object from the light source of the projector

y = the height of the shadow of the figure

$x \cdot y = k$ (the constant, which should be the same number for each figure)

x	Height of 3.5-inch figure's shadow y_1	$x \cdot y$	Height of 4-inch figure's shadow y_2	$x \cdot y$	Height of 7-inch figure's shadow y_3	$x \cdot y$
30 in	7	210	9	270	15	450
34 in	5.75	195.5	8	272	13.25	450.5
40 in	5.25	210	6.75	270	11.25	450
50 in	4.75	237.5	5	250	9	450
58.5	3.75	219.375	4.75	277.875	7.75	453.375
Range of $x \cdot y$		$\frac{195.5}{low}$		$\frac{250}{low}$		$\frac{450}{low}$
		$\frac{237.5}{high}$		$\frac{277.875}{high}$		$\frac{453.375}{high}$

1. What consistently happens to the value of y as x increases?

As x increases, y decreases.

2. Complete the columns which calculate $x \cdot y$. Give the ranges in the bottom row.

3. Which figure produced the most consistent values for $x \cdot y$?

The 7-inch figure, the largest

KEY: Enrichment: Does Movie Projector Math Work at Home?

4. What would you recommend George and Pam do to evaluate the accuracy of their measurements?

George and Pam should repeat the demonstration and make certain their measurement procedures are consistent. The 3.5-inch figure's shadows have such a wide range, there may be a problem. They might re-measure this doll's shadows at 34 and 50 inches and also re-measure the 4-inch doll at 50 inches, since those figures seem to be off the most. The problems may be related to measurement, procedure, or changing experimental conditions. The problem may well be related to the home movie projector light not producing the best light for the experiment. See "Applications Across the Curriculum: Science" for ideas on how to expand this analysis to spur classroom lab work.

5. Draw a simple graph with lines representing the height of the shadows for each size doll (y_1, y_2, y_3) vs. the distances ($x = 30, 34, 40$, etc.). Determine an appropriate scale for each axis and number them accordingly. Label the x - and y -axes and title the graph. You can use different colors to represent each doll.

As x increases, y decreases. The students should create three curves, one for each size doll, and the curves should be concentric L-shaped curves similar to the ones in the Drive-In Shadow Puppets graph, with the tallest doll's curve on top and the shortest on the bottom. The graph provided has enough lines so that the students can divide the x -axis into intervals of 5 inches and the y -axis into 1-inch intervals.

SKY-VUE DRIVE-IN: HANDOUT 5

Extension: What is Happening to the X and Y?

Name:

Date:

In studying inverse proportions, we have found that $x \cdot y = k$, a constant. As one variable increases, another variable decreases. The product of the two variables is always the same—the constant.

The term *inverse relationship* refers to the observation that as one variable increases, another variable decreases. In many inverse relationships, $x \cdot y$ may not equal k . When other variables are present or when there is not a clear mathematical relationship between the x and y variables, x and y may not change in a predictable, proportionate way relative to each other.

All inverse proportions are inverse relationships. But, not all inverse relationships are inverse proportions. Read the following scenarios and determine whether the example is an inverse relationship, an inverse proportion, or a direct proportion.

1. John's mother receives 15% of every sale. The amount made from sales is x , and y is John's mother's pay.
2. Brenda's dad manages a grocery store. He has noticed that the cheaper the price of ice cream, the more people will buy it.
3. Callie researched preschool hand washing and school absences for a science project. She found that students who spent more time on average washing hands had fewer absences. Her research showed a considerable difference in students who spent 10 seconds washing their hands and students who spent five. As she graphed her data, she found that as x (the amount of time spent washing hands) increased, the number of y (absences) decreased. She could not determine a clear mathematical relationship beyond this observation.
4. Skip is buying ingredients for soup. He will follow a special recipe and increase or decrease ingredients according to the recipe based on the number of people eating the soup. Let x be the amount of chicken broth and y be the onion. If the recipe doubles, do both x and y increase?
5. When Keisha held up her hands in front of the projector, she noticed that the length of her hands' shadow was about 2 feet. When she doubled her distance from the projector, the height of the shadow was only 1 foot. Is this an inverse proportion or direct proportion?

Extension: What Is Happening to the X and Y ?

- 6.** Jake's mother says there's a direct proportion between the time spent brushing your teeth and the number of cavities. Jake says it's probably an inverse proportion. What do you think?
- 7.** Dora's family is packing for a trip to the beach in summer. What is the relationship of the amount of time spent outside to the amount of sunscreen needed? Does the amount of sunscreen needed increase as the family spends more time outside?
- 8.** The more time Sid spent on the tread mill, the smaller his percent of body fat. Let x equal the time spent on the tread mill and y equal the percent of body fat. How would you describe this relationship?
- 9.** Harley's parents do not allow him to watch television on school nights. They believe there is an inverse relationship between the time spent watching television and grade point average. Do you think they mean direct proportion?
- 10.** Sara measured the shadow of a 20-foot flagpole. She found that when the shadow was 10 feet long, the shadow of her 12-inch ruler was 6 inches. How would you describe this relationship of x the length of the shadow to y the height of the object?
- 11.** There are 24 bars of gold available to everyone who can complete an obstacle course. Twenty-four people are attempting the obstacle course. If the number who finish is not a factor of 24, then the gold's value will be evenly divided among the finishers. If all 24 finish, then the gold will be divided among them so that each person receives one bar of gold. If 12 people finish, then the 12 finishers will each receive 2 bars of gold. If only one participant finishes, this person will receive all 24 bars of gold. At least one person will finish.
- 12.** There are 26 fair tickets to be divided evenly among the class. If some people are absent or decline, the tickets will be divided equally among those who want them. Each student who wants tickets will receive the same number with one exception. If 26 tickets can not be equally divided among the students who want them, then the spelling champ will get the extra tickets. All of the tickets will be used.

KEY: SKY-VUE DRIVE-IN: HANDOUT 5

Extension: What is Happening to the X and Y ?

In studying inverse proportions, we have found that $x \cdot y = k$, a constant. As one variable increases, another variable decreases. The product of the two variables is always the same—the constant.

The term *inverse relationship* refers to the observation that as one variable increases, another variable decreases. In many inverse relationships, $x \cdot y$ may not equal k . When other variables are present or when there is not a clear mathematical relationship between the x and y variables, x and y may not change in a predictable, proportionate way relative to each other.

All inverse proportions are inverse relationships. But, not all inverse relationships are inverse proportions. Read the following scenarios and determine whether the example is an inverse relationship, an inverse proportion, or a direct proportion.

1. John's mother receives 15% of every sale. The amount made from sales is x , and y is John's mother's pay.

John's mother's pay increases as the number of sales increase. This is a direct proportion. As x increases, so does y . John's mother makes more money as sales increase.

2. Brenda's dad manages a grocery store. He has noticed that the cheaper the price of ice cream, the more people will buy it.

This is an inverse relationship. As the price goes up (x), ice cream sales (y) decrease. However, other factors (summer vs. winter, the number of customers who come to the store, current concerns about health and fitness, packaging and placement, etc.) also affect ice cream sales, so there is not predictably proportional relationship between the price of ice cream and the number of sales. Price is just one factor in the sales data.

3. Callie researched preschool hand washing and school absences for a science project. She found that students who spent more time on average washing hands had fewer absences. Her research showed a considerable difference in students who spent 10 seconds washing their hands and students who spent five. As she graphed her data, she found that as x (the amount of time spent washing hands) increased, the number of y (absences) decreased. She could not determine a clear mathematical relationship beyond this observation.

This is an inverse relationship. As the time spent washing hands x increases, the number of absences y decreases. This is an opportunity to talk about correlations (positive and negative) done in research in which a cause is not necessarily indicated, but sets of data are linked.

4. Skip is buying ingredients for soup. He will follow a special recipe and increase or decrease ingredients according to the recipe based on the number of people eating the soup. Let x be the amount of chicken broth and y be the onion. If the recipe doubles, do both x and y increase?

Yes, most recipes are directly proportional. We increase the ingredients by the same scale factor. The amount of chicken broth and the amount of onion will both be doubled.

5. When Keisha held up her hands in front of the projector, she noticed that the length of her hands' shadow was about 2 feet. When she doubled her distance from the projector, the height of the shadow was only 1 foot. Is this an inverse proportion or direct proportion?

This is an inverse proportion. The greater the distance from the light (x), the shorter the shadow length (y). The height of the shadow is inversely related to the distance from the light. When the distance is doubled, the height is halved. $x \cdot y = k$.

KEY: Extension: What Is Happening to the x and y ?

6. Jake's mother says there's a direct proportion between the time spent brushing your teeth and the number of cavities. Jake says it's probably an inverse proportion. What do you think?

They're both wrong. We can't determine that x times y equals a constant (k) from this discussion. The more time (x) you spend brushing your teeth will probably mean fewer cavities (y). This is an inverse relationship.

7. Dora's family is packing for a trip to the beach in summer. What is the relationship of the amount of time spent outside to the amount of sunscreen needed? Does the amount of sunscreen needed increase as the family spends more time outside?

The answer to the last question is "yes," the amount of sunscreen needed does increase as the family spends more time outside. Some students will say that this is a direct proportion. It may be easily calculated. For example, it may require 4 ounces of sunscreen to cover the family for every two hours spent in the sun. It will then take 32 ounces of sunscreen to cover the family for 16 hours. x and y increase proportionally. However, other students may think this is a direct relationship, not a proportion. Spending two hours in the sun may not take twice as much sunscreen as one hour if the sunscreen lasts more than an hour. This is a good time to discuss that there are direct relationships, too, as well as direct proportions, and not every direct relationship is proportional.

8. The more time Sid spent on the tread mill, the smaller his percent of body fat. Let x equal the time spent on the tread mill and y equal the percent of body fat. How would you describe this relationship?

This is an inverse relationship. As the time Sid spends on the treadmill x increases, then the percent of body fat y decreases. But x times y most likely doesn't equal a constant. Other factors—such as Sid's individual metabolism, other physical activities, diet, the amount of body fat he had to start with, etc.—would also influence rate at which body fat decreases.

9. Harley's parents do not allow him to watch television on school nights. They believe there is an inverse relationship between the time spent watching television and grade point average. Do you think they mean direct proportion?

No, they do mean inverse relationship. Harley's parents believe that as (x) the time spent watching television increases, that (y) grade point average decreases.

10. Sara measured the shadow of a 20-foot flagpole. She found that when the shadow was 10 feet long, the shadow of her 12-inch ruler was 6 inches. How would you describe this relationship of (x) the length of the shadow to (y) the height of the object?

This is a direct proportion. As (x) the length of the shadow increases, the (y) height of the object is greater. In this case $x/y = 0.5$.

11. There are 24 bars of gold available to everyone who can complete an obstacle course. Twenty-four people are attempting the obstacle course. If the number who finish is not a factor of 24, then the gold's value will be evenly divided among the finishers. If all 24 finish, then the gold will be divided among them so that each person receives one bar of gold. If 12 people finish, then the 12 finishers will each receive 2 bars of gold. If only one participant finishes, this person will receive all 24 bars of gold. At least one person will finish.

This is an inverse proportion. 24 is the constant final product of the number of finishers by the amount of awarded gold. As the number of finishers increase, the amount of the prize decreases. The constant amount of the prize is set at 24 bars of gold or its value.

12. There are 26 fair tickets to be divided evenly among the class. If some people are absent or decline, the tickets will be divided equally among those who want them. Each student who wants tickets will receive the same number with one exception. If 26 tickets can not be equally divided among the students who want them, then the spelling champ will get the extra tickets. All of the tickets will be used.

This is an inverse relationship. As fewer people want tickets, each individual wanting tickets receives more tickets. If 26 students want tickets and each receives one, then it is an inverse proportion. If 13 students want tickets and each of these students receives 2, it is an inverse proportion. If two students want tickets and each receives 13, it is an inverse proportion. If one student wants tickets and receives 26, it is an inverse proportion. But for any other number wanting tickets, the spelling champ receives a share uneven to the rest of the class.

SKY-VUE DRIVE-IN: HANDOUT 6

Creating Silhouettes

Name: _____

Date: _____

1. Experiment to determine the best location for the subject, projector, and paper to create a profile silhouette on an 8.5-inch by 11-inch piece of paper.

Distance of projector from the wall _____

Distance of subject from the projector _____

Height of paper on the wall _____

2. Using the information above, the projector and the 8.5-inch by 11-inch paper, create a profile silhouette of each group member. Transfer the silhouette to black paper, cut it out, and place it on white paper. You may use white chalk to trace on the black paper before cutting out the silhouette. You may think of another way to do this as well. Your goal is to create a distinctive silhouette of each subject.

3. Predict where the projector, subject, and paper should be placed to create a silhouette twice the size of the profile you've already created.

Prediction:

Distance of projector from the wall _____

Distance of subject from the projector _____

Height of paper on the wall _____

Reason for Prediction:

4. Test the prediction and make appropriate adjustments to recommend a position for a 17-inch by-22 inch paper.

Recommended Position:

Distance of projector from the wall _____

Distance of subject from the projector _____

Height of paper on the wall _____

5. Describe something your group learned from this activity.

6. Group members sign their names here indicating that they have fully participated and endorsed this report.
