CONCEPT TO CREATION

Village Creek Worksheet

The foundation has been poured for the home. The home will be rectangular, with a width of 68 feet and a length of 48 feet. Your group will work with the architects to design a floor plan that meets the client's specifications.

1. On graph paper, draw a floor plan of your client's home to scale. Use the scale, one square equals 4 feet x 4 feet. Include the dimensions of all rooms. If the room is not rectangular, provide the area.

Make sure that all measurements are reasonable. This may mean that you need to do some research or measure some of the rooms in an actual home.
Student answers will vary. For sample correct answers, see Floor Plan Client A – 4x4, Floor Plan Client B – 4x4, Floor Plan Client C – 4x4, and Floor Plan Client C – Alt 4x4.

2. Your client loves the floor plan, but wants to approve of every detail before agreeing to build. The client wants to view the floor plan in a larger format. Redraw your floor plan so that one square is equal to 2 feet. Provide dimensions of all rooms. If the room is not rectangular, provide the area.
Student answers will vary and should reflect the initial house drawing submitted. For sample answers, see Floor Plan Client C – 2x2 and Floor Plan Client C – Alt 2x2.

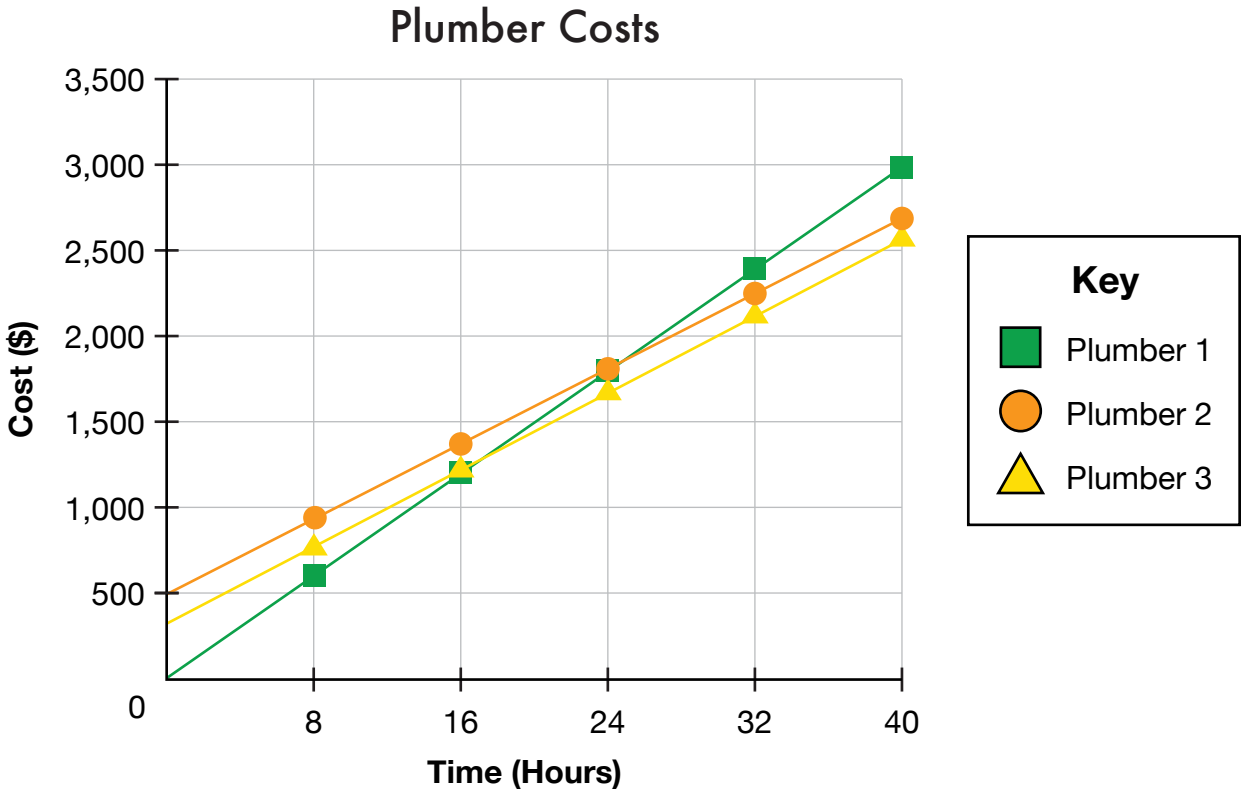
After seeing the floor plan in a larger format, the client gives your group approval to start building. You hire different professionals to work on different parts of the home.

3. Your client has an inexpensive plumber for you to use. The client's plumber, Handi-Plumbing, will work on the house for $600 upfront and then $110 per day. Your plumber, A-1 Plumbing, charges $200 a day. The plumber will work for 10 days. Write an equation to show the cost of each plumber, letting x equal the number of hours worked and y equal the total cost. Then, calculate how much each plumber would cost for 10 days of work. Show your work.

Handi-Plumbing: $y = 110x + 600$
A-1 Plumbing: $y = 200x$

When $x = 10$:
Handi-Plumbing: $y = 100(10) + 600 = \$1600$
A-1 Plumbing: $y = 200(10) = \$2000$

4. You have three choices for plumbers. Plumber 1 charges $75 per hour. Plumber 2 charges $500 to come to the jobsite and then $440 per day. Plumber 3 charges $350 to come to the jobsite and then $55 per hour. The graph shows their costs.



a. Based on the graph, which plumber would cost the least for 40 hours of work?

Plumber 3 is the least expensive.

b. Write a proportion that will help you determine how much Plumber 1 will cost for 80 hours of work, based on the cost for 40 hours of work.

$\frac{\$3{,}000}{40} = \frac{x}{80}$ OR $\frac{80}{40} = \frac{x}{\$3{,}000}$

c. Calculate how much it will cost for 80 hours of work for Plumber 1.

$40x = \$24{,}000$
$x = \$6{,}000$

5. Your electrician says she can wire $\frac{1}{2}$ of a light fixture in $\frac{1}{4}$ of an hour. She works 8 hours each day. Using proportional reasoning, calculate how many fixtures she could wire in 8 hours of work. Show or explain how you found the answer.

$$\frac{\frac{1}{2} \text{ fixture}}{\frac{1}{4} \text{ hour}} = \frac{x \text{ fixtures}}{1 \text{ hour}}$$

$$\frac{1}{4}x = \frac{1}{2}$$

$$x = 2 \text{ fixtures}$$

The electrician can wire 2 fixtures every hour.

$$\frac{2 \text{ fixtures}}{1 \text{ hour}} = \frac{x \text{ fixtures}}{8 \text{ hours}}$$

$$x = 16 \text{ fixtures}$$

She can wire 16 fixtures in 8 hours.

6. Your client has ordered 4 bathroom light fixtures to be installed. You ask a new electrician how many fixtures he can install in $\frac{1}{3}$ of an hour. He says that he can install $\frac{1}{2}$ a fixture in a $\frac{1}{3}$ of an hour. How long will it take him to install all 4 fixtures? Show or explain how you found the answer.

$$\frac{\frac{1}{2} \text{ fixture}}{\frac{1}{3} \text{ hour}} = \frac{x \text{ fixtures}}{1 \text{ hour}}$$

$$x = \frac{\frac{3}{2} \text{ fixtures}}{\text{hour}}$$

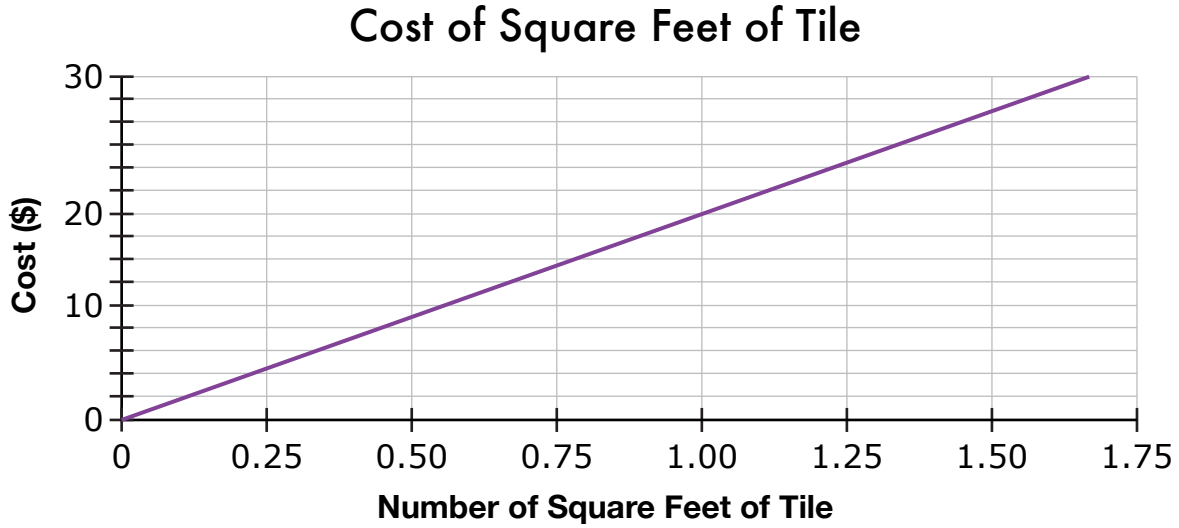
$$\frac{4 \text{ fixtures}}{\frac{\frac{3}{2} \text{ fixtures}}{\text{hour}}} = \frac{8}{3} \text{ hours} = 2\frac{2}{3} \text{ hours}$$

7. Your client wants bronze handles on the kitchen cabinets. There are four companies that sell similar handles, in bulk, listed in the table below. Find the cost per handle and complete the table. Which company has the lowest cost per handle?

Company	Cost in Bulk	Cost per Handle
A	$33.12 for 6	$5.52
B	$55.00 for 10	$5.50
C	$65.88 for 12	$5.49
D	$79.50 for 15	$5.30

Company D has the lowest cost per handle, at $5.30.

8. The graph shows the cost of tile per square foot for the bathroom floors. Typically, the tiles are bought in bulk, and therefore the retailer does not advertise the price of individual tiles.



a. If there are 4 tiles per square foot, what is the cost per tile? Show or explain how you found the answer.

If one square foot costs $20, which is the slope of the graph, $20 divided by 4 tiles per square foot is $5 per tile.

b. Based on the graph, what does the coordinate pair (8, 160) mean in terms of tiles?

(8, 160) would mean that 8 square feet of tile will cost $160 dollars.

9. Your client has chosen vanities for the bathrooms. For their master bathroom, they want a large vanity with two sinks that costs $1384.60. Luckily, the vanity is on sale for 45% off the regular price. After taking 45% off the price, the company charges 10% fee to deliver the vanity to the home. What does the client pay for the vanity after the discount and including delivery? Show or explain how you found the answer.

$$\frac{55\%}{100\%} = \frac{x}{\$1384.60}$$

$$x = \$761.53$$

$$\frac{110\%}{100\%} = \frac{x}{\$761.53}$$

$$x = \$837.68$$

10. Your client has chosen a bathtub for the master bath. The bathtub costs $599. You are able to get a 10% discount on the tub, if purchased this weekend. After the discount, there is a 5% sales tax. What is the cost of the tub after the discount and tax? Show or explain how you found the answer.

$$\frac{90\%}{100\%} = \frac{x}{\$599}$$

$$x = \$539.10$$

$$\frac{105\%}{100\%} = \frac{x}{\$539.10}$$

$$x = \$566.06$$

11. As a token of appreciation for your client's business, you offer to pay for the new front door. The door that your client chose costs $1,300. However, the door is in such high demand that the manufacturer's price is going to increase 3.5% at the end of the month. How much will the door cost next month? Show or explain how you found the answer.

$$\frac{103.5\%}{100\%} = \frac{x}{\$1,300}$$

$$x = \$1,345.50$$

