

Assignment

Name _____ Date _____

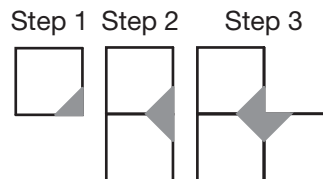
Designing a Patio Patterns and Sequences

Define each term in your own words.

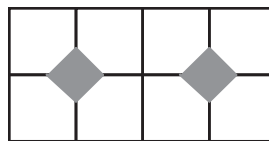
1. sequence
2. term

You are creating a tile design for your bathroom floor.

3. What are the next two terms of the sequence in your tile design? Draw a separate picture for each term.



4. Identify the term from your tile design shown at the right.



Find the next three terms in the sequence. Use complete sentences to explain how you found your answers.

5. 1, 3, 5, _____, _____, _____, ...
6. 1, 0.1, 0.01, _____, _____, _____, ...
7. 28, 24, 20, _____, _____, _____, ...
8. 2, 4, 8, _____, _____, _____, ...
9. Create your own sequence of numbers or pictures to challenge your classmates. Write or draw the first three terms. Then write a sentence describing the pattern.

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Lemonade, Anyone? Finding the 10th Term of a Sequence

The balance in your savings account is \$50. You save \$5 each week from your allowance.

1. Complete each statement below to find your savings account balance.

Balance after 1 week: $50 + 5(\underline{\quad}) = \underline{\quad}$ Balance after 3 weeks: $50 + 5(\underline{\quad}) = \underline{\quad}$

Balance after 2 weeks: $50 + 5(\underline{\quad}) = \underline{\quad}$ Balance after 10 weeks: $50 + 5(\underline{\quad}) = \underline{\quad}$

2. Write the sequence of numbers formed by your savings account balance after 1 week, 2 weeks, 3 weeks, and so on.

3. Use a complete sentence to explain what the 10th term of the sequence represents.

While watching the news, you learn that a major cold front is moving into your region of the country. The temperature is currently 40°F, and dropping at a rate of 2°F per hour.

4. Write the sequence of numbers that represents the temperature in 1 hour, 2 hours, 3 hours, and so on.

5. What is the 10th term of the sequence? Use a complete sentence to explain what the 10th term of the sequence represents.

6. Did you multiply or subtract first when determining the terms of the sequence? How would your sequence change if you reversed the order?

Perform the indicated operations. Show your work.

7. $3 + 4(2)$

8. $11 - 2(3)$

9. $42 + 3(2)$

10. $(15 - 3)4 + 2(9)$

11. $15 - 3(4) + 2(9)$

12. $33 - 5(4 + 1)$

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Dinner with the Stars Finding the n th Term of a Sequence

While your school is planning the charity dinner, you talk to a friend who recently threw a catered party. She suggests that you hire the caterer she used. Her caterer will serve dinner for only \$18 per person, but there is a one-time fee of \$25 for renting tablecloths and napkins. You can represent the total catering cost for different numbers of people with the sequence 43, 61, 79,

1. Find the total catering costs for 4, 5, and 6 people.

Number of people	1	2	3	4	5	6
Total catering cost (dollars)	43	61	79			

2. What is the total catering cost if 10 people attend the event? Use a complete sentence to explain your answer.
3. What is the total catering cost if 15 people attend the event? Use a complete sentence to explain your answer.
4. What algebraic expression can you write to represent the total catering cost in dollars if n people attend?

Evaluate each expression for the given value of the variable.

5. Evaluate $b + 7$ when b is 13.
6. Evaluate $\frac{p}{5}$ when p is 60.
7. Evaluate $2m + 4$ when m is 3.
8. Evaluate $8 - 4d$ when d is 0.

Use the n th term to list the first five terms of each sequence. Show your work.

9. $a_n = 2.5n$
10. $a_n = 6n - 5$

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Working for the CIA Using a Sequence to Represent a Problem Situation

A group of engineers is working on a design for a new car. Each member has a separate task that relates to the overall design, but it is important for all group members to understand all parts of the project. The final design is due soon, and it is crucial that all the engineers meet with each other individually to review details before the design is submitted.

1. Find the number of meetings required for 3 engineers to meet with each other individually. What is the number of meetings required for 4 engineers to meet with each other individually? What is the number of meetings required for 6 engineers to meet with each other individually?
2. Find the number of engineers involved in the project if a total of 66 meetings were required. Use complete sentences to explain how found your answer.
3. Describe another problem scenario that can be represented by the sequence in Questions 1 and 2.

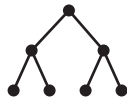
You are learning about cell division in science class. Suppose a cell divides one time each minute.

4. The sequence of pictures below represents the cell division over time. Draw the 3rd and 4th terms of the sequence.

1 minute



2 minutes



5. Complete the table below to show the number of cells over time.

Time (minutes)	1	2	3	4	5	6	7
Number of cells	2	4					

6. Write a numerical expression for the number of cells in terms of the time.

Number of cells after 1 minute: $2 = \underline{\hspace{2cm}}$

Number of cells after 2 minutes: $4 = \underline{\hspace{2cm}}$

Number of cells after 3 minutes: $8 = \underline{\hspace{2cm}}$

7. Write an algebraic expression for the number of cells in terms of the time t .

Number of cells after t minutes: $\underline{\hspace{2cm}}$

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Gauss's Formula Finding the Sum of a Finite Sequence

1. Test to see if Gauss's Formula holds true for the sum of an odd number of numbers.

A gardener expands a small 4-foot by 6-foot garden that currently exists in his backyard. Each day he increases the length and the width of the garden by 2 feet each. He then wants to buy fence to surround his garden to protect it from rabbits.

Day	0	1	2	3	4	n
Width						
Length						
Area						
Perimeter						

2. Fill in the width and length of the garden in the chart above to show how the dimensions change for the first 4 days.
3. Write expressions in the chart for the width and the length of the garden in terms of the number of days n .
4. Fill in the chart for the area of the garden over the first 4 days.
5. Write an expression in the chart for the area of the garden in terms of the number of days n .
6. Fill in the chart for the perimeter of the garden over the first 4 days. (*Hint:* The formula for the perimeter of a rectangle is $P = 2l + 2w$.)
7. Explain why the order of operations is important when using the formula for perimeter.
8. Write an expression in the chart for the perimeter of the garden in terms of the number of days n .
9. The gardener has \$125 to buy the fence, which costs \$1.25 per foot. Use your expression for the perimeter to find the maximum dimensions of the expanded garden.
10. Find the number of days it takes the gardener to expand the garden to its maximum size.

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\$8 an Hour Problem Using Multiple Representations, Part 1

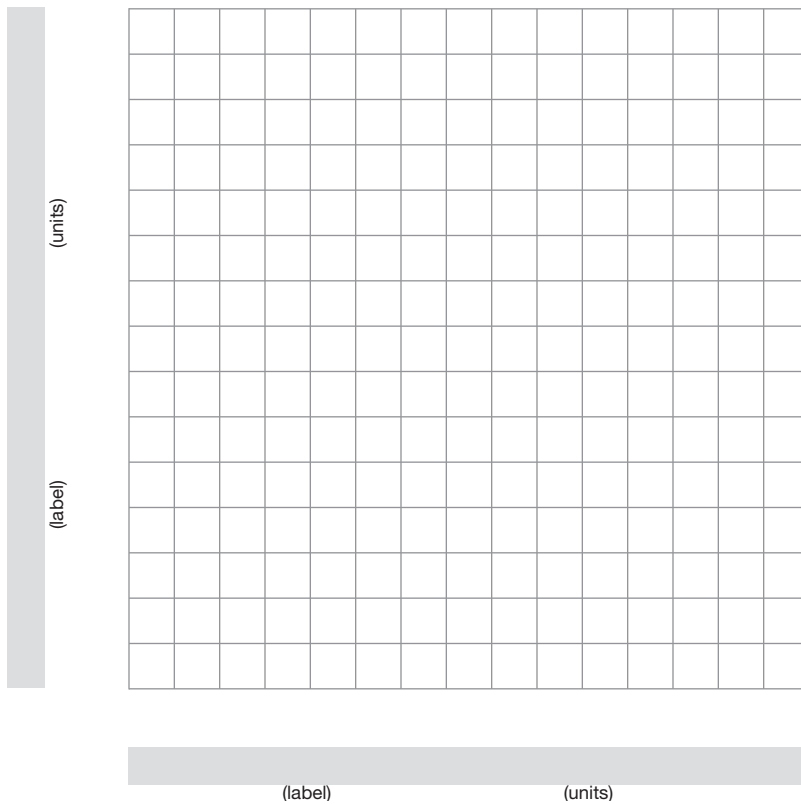
After working at Pat-E-Oh Furniture for 6 months, you receive a raise. Your new pay rate is \$9.50 per hour.

1. The table below shows the number of hours that you have worked for the first 4 weeks following your raise. Complete the table.

Quantity Name	Week	Time worked	Earnings
Unit		hours	dollars
	Week 1	40	
	Week 2	4	
	Week 3	8	
	Week 4	20	

2. Use the bounds and intervals to label the grid on the next page. Then create a graph of the data in the second and third columns of the table in Question 1.

Variable quantity	Lower bound	Upper bound	Interval
Time worked	0	60	4
Earnings	0	450	30



- Next week you can work 12 hours. Use the graph to approximate the amount of money that you will earn. Use a complete sentence to explain how you found your answer.
- Write an expression that you can use to find the earnings for any number of hours worked. Let h represent the number of hours worked. Use a complete sentence in your answer.
- Use the expression to find the exact amount you would earn in 12 hours. Use a complete sentence in your answer.
- Use a complete sentence to explain the difference between an algebraic expression and an algebraic equation. Show an example of each one.
- Is $m = 4$ the solution to the equation $m + 10 = 14$? Why or why not?

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Assignment for Lesson 1.7

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The Consultant Problem Using Multiple Representations, Part 2

Complete the conversion.

1. 30 min = _____ hr
2. 150 min = _____ hr
3. 2.75 hr = _____ min
4. 2.3 mi = _____ yd
5. 42 in. = _____ ft
6. 4.2 ft = _____ in.

Write an algebraic equation for each situation. Then identify the dependent and independent variables.

7. A plumber earns \$62 for each hour that she works. Let E represent her earnings in dollars for h hours of work.
8. A marathon runner averages 10 miles per hour. Let m represent the distance in miles run in h hours.
9. A seamstress can hem 3 skirts each hour. Let s represent the number of skirts she hems in h hours.
10. You earn \$12 for each yard you mow. Let E represent your earnings in dollars for mowing y yards.

Your aunt was recently hired to work for a large law firm. Over the course of her first year, she will work on several projects. She receives a stipend of \$3250 for each completed project.

11. What are the two variable quantities in this problem situation?
12. Which variable quantity is the independent variable? Write a sentence explaining your answer.
13. How much money will your aunt make if she completes 5 projects?
14. How many projects did your aunt complete if she earned \$32,500?

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Assignment for Lesson 1.8

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U.S. Shirts Using Tables, Graphs, and Equations, Part 1

Define each term in your own words.

1. variable quantity
2. constant quantity

Evaluate each algebraic expression for the value given. Show your work.

3. $8s + 15$ when $s = 20$

4. $10 - 2m$ when $m = 4$

5. $\frac{1}{2}r + 30$ when $r = 10$

You want to save money for college. You have already saved \$500, and you are able to save \$75 each week.

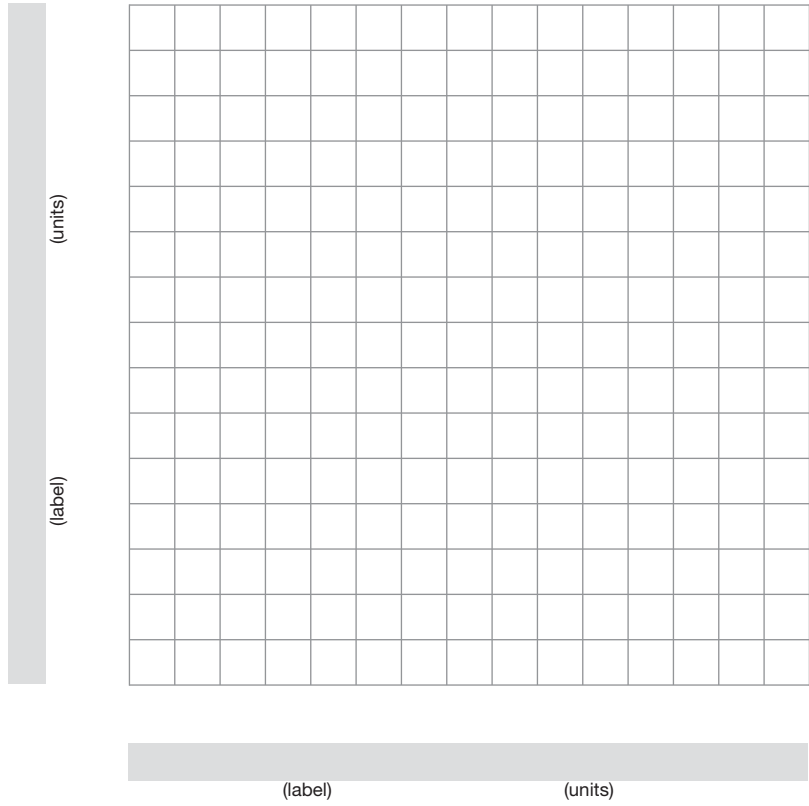
6. If you continue to save money at this rate, what will your total savings be in 3 weeks? What will your total savings be in 10 weeks? What will your total savings be in 6 months? (*Hint: There are four weeks in one month.*)
7. Use a complete sentence to explain how you found the total savings in Question 6.
8. If you continue to save money at this rate, how long will it take you to save \$2000? How long will it take you to save \$8000? How long will it take you to save \$11,750?
9. Use a complete sentence to explain how you found the answers to the number of weeks in Question 8.

10. Complete the table using the data from Questions 6 and 8. Be sure to fill in your labels and units.

Quantity Name		
	Unit	

11. Use the grid below to create a line graph of the data from the table in Question 10. First, choose your bounds and intervals. Be sure to label your graph clearly.

Variable quantity	Lower bound	Upper bound	Interval
Time			
Total savings			



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12. Write an algebraic equation for the problem situation. Use a complete sentence in your answer.

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Assignment for Lesson 1.9

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Hot Shirts Using Tables, Graphs, and Equations, Part 2

Estimate the value of each expression.

1. $118 - 22$

2. $511 + 293$

3. 299×0.99

4. 5.26×24.74

5. $958.16 + 239.85$

6. $39.78 - 14.92$

7. Give an example from daily life when estimating skills are important.
8. Your cousin thinks of a number. He multiplies this starting number by 4 and then adds 12 to get 32. What is the starting number? Use a complete sentence to explain how you found your answer.

Great Freights, a local shipping company, bases its charges on the weight of the items being shipped. In addition to charging \$.40 per pound, they also charge a one-time fee of \$10 to set up a customer's account.

9. How much does Great Freights charge to ship a package that weighs 20 pounds?
50 pounds?
10. Estimate the weight of a package if Great Freights charges the customer \$45.
11. Write an algebraic equation for the problem situation. Use a complete sentence in your answer.
12. Explain why an equation may be the most useful way to represent the problem situation.

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Comparing U.S. Shirts and Hot Shirts Comparing Problem Situations Algebraically and Graphically

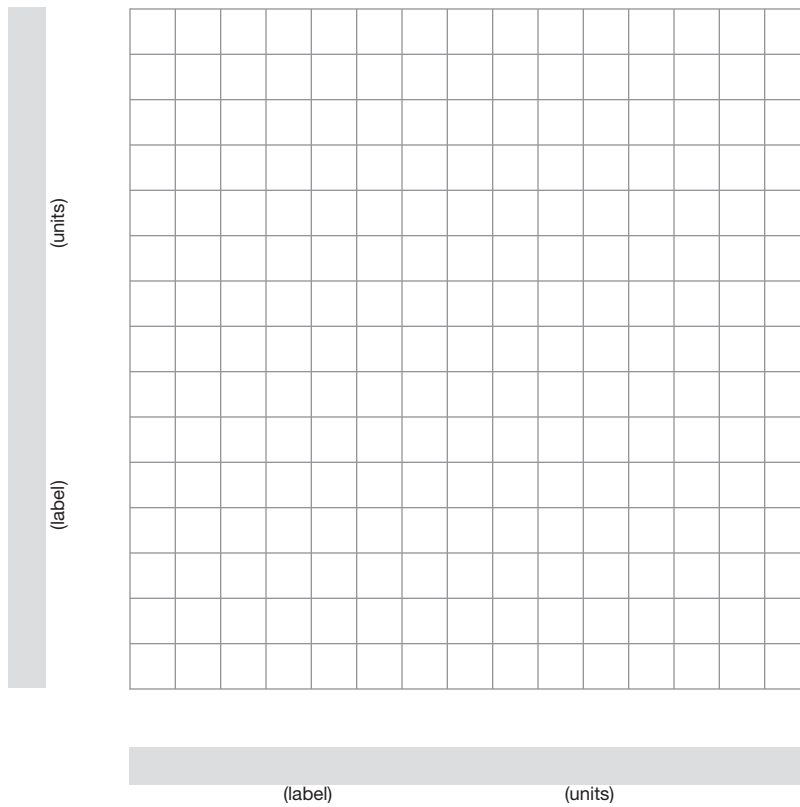
Two twin brothers, Mike and Mark, are looking for after school jobs. They are both offered jobs at grocery stores. Mike is offered a job at Fresh Foods making \$10 per hour. Mark is offered a job at Groovy Groceries making \$8 an hour, plus a one-time hiring bonus of \$100. Each twin believes that he has been offered the better job.

1. How much does Mike earn at Fresh Foods if he works 20 hours? 40 hours? 60 hours?
2. Use a complete sentence to explain how you found Mike's earnings.
3. How much does Mark earn at Groovy Groceries if he works 20 hours? 40 hours? 60 hours?
4. Use a complete sentence to explain how you found Mark's earnings.
5. Complete the table using the data from the problem and from Questions 1 and 3. Be sure to fill in your units.

Quantity Name	Time worked	Mike's earnings at Fresh Foods	Mark's earnings at Groovy Groceries
Unit			

6. Use the grid below to create a graph of the data in the table in Question 5. First, choose your bounds and intervals. Be sure to label your graph clearly.

Variable quantity	Lower bound	Upper bound	Interval
Time worked			
Earnings			



7. After how many hours will the twins earn the same amount of money? Use complete sentences to explain how you found your answer.
8. Whose job is better, Mike's or Mark's? Use complete sentences to explain your reasoning.