

4th Grade Unit 1: Patterns & Algebra (Form A)

Name _____

Date _____

Standard:

8.OA.5 generate a number or shape pattern that follows a given rule; identify apparent features of the pattern that were not explicit in the rule itself

1. A set of numbers was created using a rule that states, "Start with 6 add 4." Write the first 5 numbers of this set.

2. The numbers below follow a pattern. Write the next two numbers.

97, 85, 73, 61, _____, _____

3. Name the factors of 28:

4. Choose a rule to describe the pattern in the numbers below:

2, 5, 11, 23

- a. add 3
- b. multiply by 2
- c. add 1, then multiply by 2
- d. multiply by 2, then add 1

5. Kyle makes key chains to raise money for his school. He uses the same number of beads on each key chain. Use the table below to determine the number of beads Kyle uses to make 25 key chains.

<i>Key chains</i>	<i>Beads</i>
2	16
3	24
4	32
5	40
...	...
25	

Kyle uses _____ beads for 25 key chains.

6. Will and Tanner sell popcorn for their Boy Scout troop. The troop earns \$5 for every \$15 of popcorn sold. How much will the troop earn if the boys sell \$30 worth of popcorn? if they sell \$90 worth of popcorn? Use the table below to show your answers.

<i>Selling Price</i>	<i>Troop Earns</i>
<i>s</i>	<i>e</i>
15	5
30	
60	20
90	

What is the rule?

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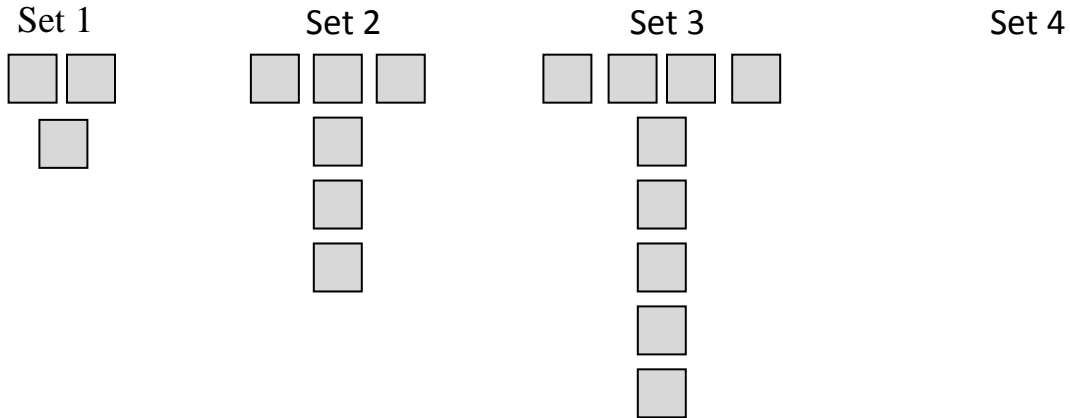
Date _____

7. Ajani wanted to improve his basketball skills by practicing foul shots over the 9 days of Fall Break. On the first day his goal was to make 10 shots; on the second day, 15 shots; and on the third day 20 shots. Complete the table to show how many foul shots Ajani made on the eighth day of Fall Break if he met his goal. Which two equations at the right could be used to describe the rule for the table?

Input	Output
d	f
1	
2	
3	
4	
5	

- Rule: a. $d + 9 = f$
 b. $d \times 5 = f$
 c. $d \times 5 + 5 = f$
 d. $(d + 1) \times 5 = f$

8. Identify the pattern in the first 3 sets of color tiles. Apply the pattern to draw Set 4.



9. Alexis earns 3 dollars for each load of laundry (l) she washes. Which table correctly shows her earnings (e)?

a.

l	e
1	3
2	5
3	6
4	7

b.

l	e
2	8
3	12
4	16
5	20

c.

l	e
3	2
6	4
9	7
12	10

d.

l	e
3	9
5	15
8	24
...	...
11	33

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10. Look at the following shapes:



a. Predict what the 16th shape will be, and tell why you think so:

b. Now extend the pattern:

The 16th shape is a _____

11. Generate a number pattern that follows this rule:

Subtract 3, then add 2

List a sequence of five numbers that could be part of this pattern:

CHALLENGE:

12. Gavin has a summer job mowing lawns. He wants to save money to buy a new go kart. The Ground Force Drifter is \$250. Gavin decides to double the amount he puts aside each week until he has enough to buy the go kart. The first week he saves \$2, the second week he adds \$4 more, and the third week he adds \$8 more to his savings account.

a. Complete the table to show how much Gavin will add to his savings account on the sixth week if he continues the same pattern of saving.

b. Add a third column to the table to calculate the total in Gavin's savings account after he adds the new amount each week.

c. At this rate, how long will it take Gavin to save \$250?

Input	Output
m	e
1	2
2	4
3	8
4	
5	

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Answer Key

1. 6 10 14 18 22

2. 97, 85, 73, 61, 49, 37

3. 1×28
 2×14
 4×7

4. a. add 3
b. multiply by 2
c. add 1, then multiply by 2
(d) multiply by 2, then add 1

5.

Key Chains	Beads
2	16
3	24
4	32
5	40
...	...
25	200

6.

Selling Price	Troop Earns
s	e
15	5
30	10
60	20
90	30

What is the rule? *divide by 3*

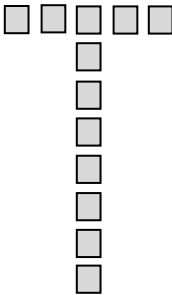
7.

Input	Output
d	f
1	10
2	15
3	20
4	25
5	30
6	35
7	40
8	45

Rule: a. $d + 9 = f$
b. $d \times 5 = f$
(c) $d \times 5 + 5 = f$
(d) $(d + 1) \times 5 = f$

Students should be able to find both correct answers, but teachers may use discretion as to whether only one correct answer will be accepted.

8.

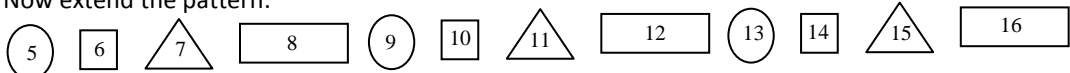


9. **(d)**

l	e
3	9
5	15
8	24
...	...
11	33

10. a. Reasonable predictions accepted. Example: the 16th shape will be a rectangle because there are 4 shapes and $4 \times 4 = 16$.

b. Now extend the pattern:



The 16th shape is a rectangle

11. 10 9 8 7 6 (any sequence of numbers will be accepted as long as they follow the rule)

CHALLENGE: (Teachers may use item #12 to differentiate instruction)

12. a. Gavin will add \$64 on the 6th week.
b. Add a third column to the table to calculate the total in Gavin's savings account after he adds the new amount each week.
c. At this rate, how long will it take Gavin to save \$250? 7 weeks

Input	Output	Savings
m	e	
1	2	2
2	4	6
3	8	14
4	16	30
5	32	62
6	64	126
7	128	254