

Name _____

Number Patterns

Essential Question How can you make and describe patterns?



Operations and Algebraic Thinking—4.OA.C.5

MATHEMATICAL PRACTICES

MP1, MP4, MP5, MP7

Unlock the Problem

Daryl is making a pattern for a quilt. The pattern shows 40 squares. Every fourth square is blue. How many blue squares are in the pattern?

A **pattern** is an ordered set of numbers or objects. Each number or object in the pattern is called a **term**.

Activity Find a pattern.

Materials ■ color pencils

Shade the squares that are blue.

	1	2	3	4	5	6	7	8	9	10	
	11	12	13	14	15	16	17	18	19	20	
	21	22	23	24	25	26	27	28	29	30	
	31	32	33	34	35	36	37	38	39	40	

Math Talk

MATHEMATICAL PRACTICES 7

Look for a Pattern
Describe another number pattern in Daryl's quilt.

Which squares are blue? _____

So, there are _____ blue squares in the pattern.

1. What patterns do you see in the arrangement of the blue squares?

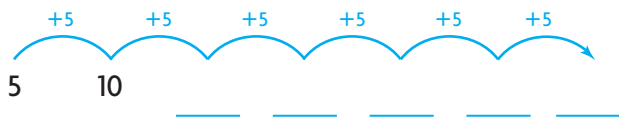
2. What patterns do you see in the numbers of the blue squares?



Example Find and describe a pattern.

The rule for the pattern is *add 5*. The first term in the pattern is 5.

A Use the rule to write the numbers in the pattern.



5, 10, _____, _____, _____, _____, _____, _____, _____, ...

B Describe other patterns in the numbers.

What do you notice about the digits in the ones place?

Describe the pattern using the words *odd* and *even*.

Describe the pattern using the word *multiples*.

Try This! Find and describe a pattern.

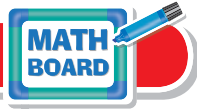
The rule for the pattern is *add 3, subtract 1*. The first term in the pattern is 6.



Describe another pattern in the numbers.

Name _____

Share and Show



MATHEMATICAL PRACTICES 5

Use Patterns How do you use the first term in a pattern to find the next term?

Use the rule to write the numbers in the pattern.

1. Rule: Subtract 10. First term: 100

Think: Subtract 10

100

100, _____, _____, _____, _____, ...

Use the rule to write the numbers in the pattern.
Describe another pattern in the numbers.

2. Rule: Multiply by 2. First term: 4

4, _____, _____, _____, _____, ...

3. Rule: Skip-count by 6. First term: 12

12, _____, _____, _____, _____, ...

On Your Own

Use the rule to write the first twelve numbers in the pattern. Describe another pattern in the numbers.

4. Rule: Add 7. First term: 3

5. Rule: Add 2, add 1. First term: 12

6. **MATHEMATICAL PRACTICE 5 Use Patterns** Marcie likes to collect stickers, but she also likes to give them away. Currently, Marcie has 87 stickers in her collection. If Marcie collects 5 new stickers each week and gives away 3 stickers each week, how many stickers will Marcie have in her collection after 5 weeks?

Problem Solving • Applications



7. **THINK SMARTER** John is saving for his trip to see the Alamo. He started with \$24 in his savings account. Every week he earns \$15 for baby-sitting. Out of that, he spends \$8 and saves the rest. John uses the rule *add 7* to find out how much money he has at the end of each week. What are the first 8 numbers in the pattern?



Personal Math Trainer

8. **THINK SMARTER +** Draw a check under the column that describes the number.

	Prime	Composite
81		
29		
31		
62		

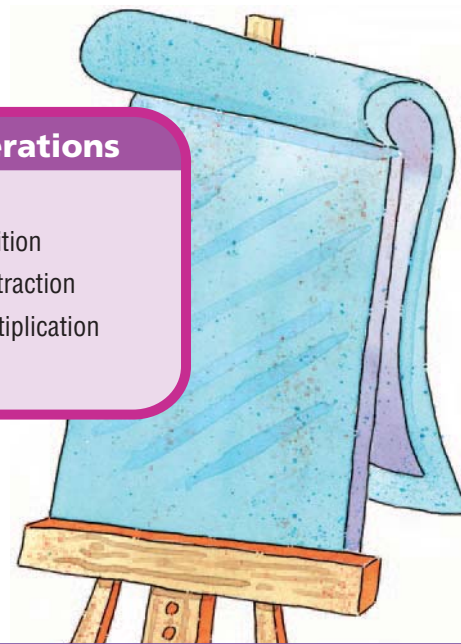
Pose a Problem

9. **GO DEEPER** An activity at the Math Fair shows two charts.

Numbers
2
3
5
6
10

Operations
addition
subtraction
multiplication

Use at least two of the numbers and an operation from the charts to write a pattern problem. Include the first five terms of your pattern in the solution to your problem.



Pose a problem.	Solve your problem.

- Describe other patterns in the terms you wrote.

Name _____

Number Patterns



COMMON CORE STANDARD—4.OA.C.5
Generate and analyze patterns.

Use the rule to write the first twelve numbers in the pattern.
Describe another pattern in the numbers.

1. Rule: *Add 8.* First term: 5

Think: Add 8.



5, 13, 21, 29, 37, 45, 53, 61, 69, 77, 85, 93

All the terms are odd numbers.

2. Rule: *Subtract 7.* First term: 95

3. Rule: *Add 15, subtract 10.* First term: 4

Problem Solving



4. Barb is making a bead necklace. She strings 1 white bead, then 3 blue beads, then 1 white bead, and so on. Write the numbers for the first eight beads that are white. What is the rule for the pattern?
5. An artist is arranging tiles in rows to decorate a wall. Each new row has 2 fewer tiles than the row below it. If the first row has 23 tiles, how many tiles will be in the seventh row?

6. **WRITE** *Math* Give an example of a rule for a pattern. List a set of numbers that fit the pattern.

Lesson Check (4.OA.C.5)

1. The rule for a pattern is *add 6*. The first term is 5. Write the first five terms in the pattern.
2. What are the next two terms in the pattern 3, 6, 5, 10, 9, 18, 17, ...?

Spiral Review (4.OA.B.4, 4.NBT.B.4, 4.NBT.B.5)

3. To win a game, Roger needs to score 2,000 points. So far, he has scored 837 points. How many more points does Roger need to score?
4. Sue wants to use mental math to find 7×53 . Write an expression she could use.

5. Pat listed all the numbers that have 15 as a multiple. Write the numbers in Pat's list.
6. Complete the following sentence using the correct term.

14 is a _____ of 7 and 14.
