LESSON 5.1

Model Factors

Reteach Tier 1

Kinesthetic / Visual
Whole Class / Small Group

Materials two-color counters or unit cubes

- One student takes a handful of counters or cubes. The group then works together to make an array with 1 as a factor. Then the group writes the factor pair along with the product the array represents. For example, if a student takes 18 cubes, the group would write $1 \times 18 = 18$.
- **Can you separate your group of counters into two equal groups? If so, make an array with 2 rows and write that number pair.** $2 \times 9 = 18$
- Repeat the questioning for groups of 3 and 4.

Challenge students to make as many factor pairs as possible using all the counters in their group.

Tier 2

Kinesthetic
Small Group

Materials unit cubes

- Allow a volunteer to pull two handfuls of unit cubes from a container with approximately 30 to 40 units cubes.
- Have students arrange the cubes into an array with 1 row. **What two factors does this array show?** Possible answer: 1 and 18 **What product is shown?** Possible answer: 18 Record the factor pair and the product on the board.
- Have the group work together to arrange and record all the different arrays that can be made from the unit cubes. Remind them that each row must have the same number of cubes and that each column must have the same number of cubes.
- Have the group repeat the activity by adding another handful of unit cubes.

LESSON 5.2

Factors and Divisibility

Reteach Tier 1

Logical / Kinesthetic
Whole Class / Small Group

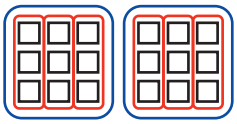
Materials connecting cubes

- Show 21 cubes. **Make groups of 3. Is 21 divisible by 3?** yes **How do you know?** There are no cubes left over.
- **Use cubes to see if 21 is divisible by 6 or 9.**

If a number is divisible by 3, then it may or may not be divisible by 6 or 9.

- Show 18 cubes. **Make groups of 9. Is 18 divisible by 9?** yes **Make groups of 3. Is 18 divisible by 3?** yes
- **How did you go from groups of 9 to groups of 3?** I broke each 9 into 3 groups of 3.
- **How does 3 relate to 9? 9 to 3?** 3 is a factor of 9; 9 is divisible by 3

Emphasize to students that a number is divisible by each of its factors.



The blue lines show 18 cubes in groups of 9. The red lines show 18 cubes in groups of 3.

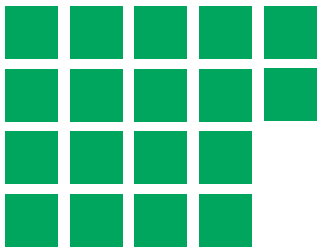
Tier 2

Kinesthetic
Small Group

Materials color tiles

Have each student count out 18 color tiles. **Is 4 a factor of 18?**

- **If 4 is a factor of 18, then we can arrange 18 tiles into 4 equal rows.** Have students place a tile in each of the four rows. Students should continue adding one tile at a time to each row until all of the tiles have been used.
- **Do all of the rows have the same number of tiles?** no **So, is 4 a factor of 18?** no
- Have students repeat the activity with other numbers such as 2, 3, 5, and 6.



LESSON 5.3

Problem Solving • Common Factors

Reteach Tier 1

Visual / Kinesthetic
Whole Class / Small Group

- Have students practice using the strategy *make a list* by solving the following problem.

  Two families go on a trip to the marine park. All tickets are the same price, which is a whole-dollar amount. One family spends $28, and the other family spends $21. What are the possible costs of each ticket? $1, $7

- **How can $28 be divided evenly?** $1, $2, $4, $7, $14, or $28
- **How can $21 be divided evenly?** $1, $3, $7, $21
- **Why is $1 unlikely to be the answer?** Possible answer: most families have fewer than 21 or 28 members.
- **How much did each ticket cost?** $7
- After students determine the price of each ticket, they may consider how many members are in each family. 4 members, 3 members

Tier 2

Visual / Kinesthetic
Small Group

Materials square tiles

- Have students make a list to solve the problem.

  Ana puts 12 dog figures and 18 bear figures on shelves. Ana will arrange the figures so each shelf has the same animal and number of figures. What are the possible numbers of figures she can put on each shelf?

- Draw a table as shown. **Use the table to find common factors.**

Factors of 12		Factors of 18	
1	4	1	6
2	6	2	9
3	12	3	18

- Have students use square tiles to find the factors of 12, and then list the factors in the table. Repeat for the number 18.
- Have students underline the common factors. **How many figures can Ana put on each shelf?** She can put 1, 2, 3, or 6 figures on each shelf.

LESSON 5.4

Factors and Multiples

Reteach Tier 1

Visual / Kinesthetic
Whole Class / Small Group

Materials masking tape, Number Lines (by ones) (see *eTeacher Resources*)

- Mark the floor of the classroom with four number lines, each marked 0 to 20.
- Have a group of students stand at the beginning of each number line.
- Assign each group one of the following numbers: 2, 3, 4, 6.
- Have students mark the multiples of their numbers up to 20.
- Ask students to determine the common multiples of the numbers by looking for the same marked numbers on other number lines. For example: What are the common multiples of 2 and 3? 6, 12, and 18
- Students can copy the four number lines onto their paper number lines.

Tier 2

Kinesthetic
Small Group

Materials counters

- Present the problem: **Jana wants to put stickers in her sticker book. She wants to make equal rows with 4 stickers in each row. She does not want a page with extra stickers in an unequal row. Should she put 8 stickers on each page or 10 stickers on each page?**
- Work with students to model how to use counters to show a total number of stickers, such as 8, and then to place the counters into equal rows with 4 counters in each row.
- Ask students to tell whether there are any stickers in an unequal row. Discuss the idea that if there are leftover stickers, the total number of stickers is not a multiple of 4. Have students tell which number(s) are multiples of 4 and which number(s) are not multiples of 4.

LESSON 5.5

Prime and Composite Numbers

Reteach Tier 1

Visual / Kinesthetic
Whole Class / Small Group

Materials square tiles

- Remind students that a prime number has exactly two factors, 1 and itself.
- Have students use square tiles to determine whether 21 is a prime number. **Use the tiles to make as many different rectangles as you can. Record the dimensions of each rectangle.**
- **What are the factors of 21?** Each dimension is a factor; 1, 3, 7, 21.
- **Is 21 a prime number?** no **How do you know?** It has more than two factors.
- Have students model rectangles for 23, 25, 27, and 29 and determine if each number is prime. prime: 23, 29; composite: 25, 27

Tier 2

Visual / Kinesthetic
Small Group

Materials square tiles

- Have students arrange 8 tiles to show $4 \times 2 = 8$.
- **What is another way you can arrange the 8 tiles?** 1 row of 8 **What factors does your new rectangle show?** 1, 8 So, the factors of 8 are 1, 2, 4, and 8.
- Have students arrange 7 tiles to show the factors of 7. **How did you arrange the tiles?** 1 row of 7 **Can you make any other rectangle?** no So, the factors of 7 are 1 and 7.
- Review the definitions for *prime number* and *composite number*. Have students identify 8 and 7 as prime or composite. 8, composite; 7, prime
- Have students use tiles to find which number in another pair is prime and which is composite.

LESSON 5.6

Algebra • Number Patterns

Reteach Tier 1

Visual / Verbal
Whole Class / Small Group

- Write 3, 6, 9, 12, 15 on the board. **What do you notice about this set of numbers?** Possible answer: they appear to be in a pattern; you skip count by 3.
- **What rule can you write for this pattern? Explain.** Possible answer: add 3; if you add 3 to one term in the pattern, you get the next term.
- Discuss how you can use a rule to generate a pattern. **The first term in a pattern is 1. The rule is *add 5.* What are the first five terms of the pattern?** 1, 6, 11, 16, 21 **What do you notice about the numbers in the pattern?** Possible answer: the ones digit alternates between 1 and 6.
- Have students work in pairs. Have one partner write a rule and the other partner generate a pattern based on that rule. Then have students describe their patterns.

Tier 2

Kinesthetic
Small Group

Materials counters, index cards, tape

- Work with students to build a number pattern using counters. Tape 4 counters onto an index card to make a Rule Card. Write a + symbol before the 4 counters.
- Write the number 1. Give each student 1 counter. Place the Rule Card to the right of the number 1. Have students add 4 counters to their collection and write the number sentence $1 + 4 = 5$. Tell students that the sum, 5, is the next number in the pattern. Record to show the terms: 1, 5.
- Continue this process to find and record each next term in the pattern: 1, 5, 9, 13, 17.
- Repeat the activity with a Rule Card that shows the rule *subtract 3* and use a first term of 22.