

## Prime and Composite Number Mini Lab

### Overview

Students will be able to identify prime and composite numbers.

### Benchmarks

#### 3-4<sup>th</sup> grade

Number, Number Sense and Operations

E. Recognize and classify numbers as prime or composite and list factors.

#### 5-7<sup>th</sup>

G. Apply and explain the use of prime factorization, common factors, and common multiples in problem situations.

### Vocabulary

Factor, prime number, composite number, prime factorization

### Time

Approximately 1 hour

### Materials

Square tiles (20 per student group), Prime Number Mini Lab worksheet (1 per student)

### Procedure

1. Have students work in groups of two.
2. Give each group 20 square tiles and two worksheets. Instruct students that they can work with a partner to model the rectangles, but each student must complete their own table.
3. In form students that any given number of squares can be arranged into one or more rectangles. Model how to form a rectangle using 2 squares. (You may need to review the definition of a rectangle.) Note a 1 x 2 rectangle is the same as a 2 x 1 rectangle. Sketch the rectangle in the center column and list the factors of 2 in the column to the right as 1 x 2.
4. Continue this process by modeling a rectangle using 3 squares. Ask students if they can make any other rectangle using 3 squares. Sketch the rectangle in the center column and list the factors 1 x 3 in the column on the right. Next ask the students to model a rectangle using 4 squares. Can they make more than 1? Sketch the rectangles and list the factors: 1 x 4 and 2 x 2.
5. Have students work their partners to continue this process for the numbers 5 through 20. Walk about the room observing and asking questions such as are you sure that is the only rectangle you can form?
6. Allow sufficient time for students to finish the activity. Have something for those who work faster to do while the others finish.

7. When all students have finished, bring the students together and ask some questions about their results. For what numbers can more than rectangle be formed? (4,6,8,9,10,12,14,15,16,18,20) For what numbers can only one rectangle be formed? ( 2,3,5,7,11,13,17,19) For the numbers in which only rectangle is formed, what do you notice about the dimensions of the rectangle? (The dimensions are the number 1 and the number of squares needed to form the rectangle.)
8. Write the definition of a prime number on the board (a whole number that has exactly two factors, 1 and the number itself) and discuss which numbers fit the criteria and are prime.
9. Write the definition of composite number (a number greater than 1 with more than two factors) and discuss the numbers that are composite.
10. Explain that the numbers 0 and 1 are neither prime nor composite.
11. Practice identifying prime and composite numbers by listing the factors of each number. **Is 28 prime, composite or neither?** The factors are 1 and 28, 4 and 7, and 2 and 14. (composite)
12. Challenge students to determine if some larger numbers such as 50, 37, 81, and 100 are prime, composite or neither.

### **Informal Assessment**

The teacher can make observations as the students are working in pairs and also by asking questions.

### **Formal Assessment**

The teacher could use a worksheet with various numbers on it ask to student to determine if the numbers are prime, composite, or neither.

### **Extension Activity**

Practice prime factorization of numbers using factor trees.

<b>Number of Squares</b>	<b>Sketch of Rectangle Formed</b>	<b>Dimensions of Each Rectangle</b>
2		1 x 2
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

13		
14		
15		
16		
17		
18		
19		
20		