Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_\_\_\_\_

**Making Rectangles to Identify Factors**

Using the graph provided, show all the different rectangles you can make using the number of tiles indicated and draw them on the grid below (shade tiles using a pencil or colored pencil). Complete the rest of the chart after you have created all the possible number of rectangles with the given number of tiles.

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| **Number of Tiles** | **Rectangles** | | | | | | | | | | | | | | | | | | | | **List the Factor Pairs** | **Is it a Prime or Composite Number?** |
| **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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**Practice:**

List all the factors of each number. You can use either the rainbow method or the T-Chart method. Factors need to be arranged in order from least to greatest.

1. 49 2. 12 3. 52 4. 75

**Prime Factorization:** Write the prime factorization of each number. Show your work as a factor tree and circle all prime numbers, then check to see that your answer is written as a product of prime numbers.

5.   
6. 7. 8.

Create a factor tree for   
**490**

Create a factor tree for   
**100**

Create a factor tree for   
**24**

Create a factor tree for   
 **18**

Write your answers below in the correct prime factorization form:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Double check….. Are all the numbers in your final answer prime numbers? Yes or No.

If no, go back and break down your number further until you only have a product of prime numbers.

Name \_\_\_\_\_key\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block \_\_\_\_\_\_\_\_\_\_

**Making Rectangles to Identify Factors**

Using the graph provided, show all the different rectangles you can make using the number of tiles indicated and draw them on the grid below. Complete each section of the chart after you have created all the possible number of rectangles with the given number of tiles.

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| **Number of Tiles** | **Rectangles** | | | | | | | | | | | | | | | | | | | | **List the Factor Pairs** | **Is it a Prime or Composite Number?** |
| **4** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 x 4  2 x 2 | C |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **7** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 x 7 | P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **12** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 x 12  2 x 6  3 x 4 | C |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **9** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 X 9  3 X 3 | C |
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| **16** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 X 16  2 X 8  4 X 4 | C |
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| **11** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 X 11 | P |
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**Methods for listing factors of a number:**

**Method 1: Factor Rainbow.**

Create a factor rainbow to find the factors of 24.

**Steps for Factor Rainbow**

1. Start with 1 and 24, which is the range for finding possible factors.
2. Determine if the next prime number has a factor that creates 24.
3. Continue until all of the factors are determined.

****

**Method 2: Factor T – Chart.**

List all of the factors of 24 using a T-Chart.

**Steps for T-Chart**

1. Start with 1 and 24, which is the range for finding possible factors.
2. Determine if the next consecutive number has a factor that creates 24
3. Continue until all of the factors are determined and they do not repeat.

**24**

1. **24**
2. **12**
3. **8**
4. **6**

**Practice:**

List all the factors of each number. You can use either the rainbow method or the T-Chart method. Factors need to be arranged in order from least to greatest.

1. 49 2. 12 3. 52 4. 75

1, 7, 49 1, 2, 3, 4, 6, 12 1, 2, 4, 13, 26, 52 1, 3, 5, 15, 25, 75

1. 48 6. 60 7. 81 8. 16

1, 2, 3, 4, 6, 8, 12, 16, 24, 48 1, 2, 3, 4, 5, 6, 10, 12, 1, 3, 9, 27, 81 1, 2, 4, 8, 16

15, 20, 30, 60

**Final Thoughts:**

1. Explain how you can use rectangles to determine factors of numbers. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Why is it possible to draw more than two different rectangles with an area of 24 square units, but it is not possible to draw more than two different rectangles with an area of 17 square units? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_