

<b>Chapter 1</b>	<b>Numerical Expressions and Factors</b>
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	<b>1.4 Prime Factorization</b>
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<b>Essential Question</b>	
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	How do I find the prime factors in a number?
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<b>Vocab</b>	
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	Factor pairs are 2 numbers that are multiplied together to get a product.
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	Example: 2 and 5 are a factor pair of 10 because $2 \times 5 = 10$ .
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Complete the following problems in your composition book.

- 1) The brass section of a marching band has 30 members. The band director arranges the brass section in rows. Each row has the same number of members. What are the possible arrangements of musicians?

30 members

$$30 = 1 \times 30$$

$$30 = 2 \times 15$$

$$30 = 3 \times 10$$

$$30 = 5 \times 6$$

1 row of 30

2 rows of 15

3 rows of 10

5 rows of 6

6 rows of 5

10 rows of 3

15 rows of 2

30 rows of 1

List the factor pairs for each number.

2) 12

1, 12

2, 6

3, 4

3) 20

1, 20

2, 10

4, 5



Complete problems 1- 4 on your notes.

1) 18

1, 18

2, 9

3, 6

2) 24

1, 24

2, 12

3, 8

4, 6

3) 51

1, 51

3, 17

4) The woodwinds section of the marching band has 38 members. Which has more possible arrangements, the brass section or the woodwinds section? Explain.

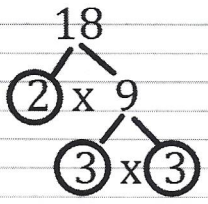
38

1, 38

2, 19

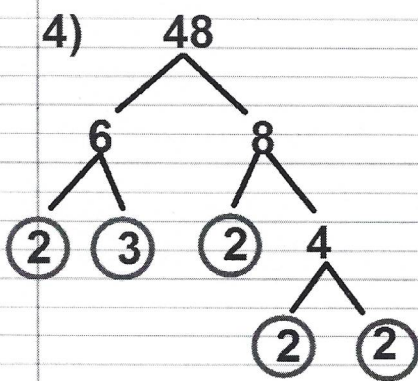
The brass section has more because it has 8 different arrangements and the woodwinds only has 4 different arrangements.

**Vocab**

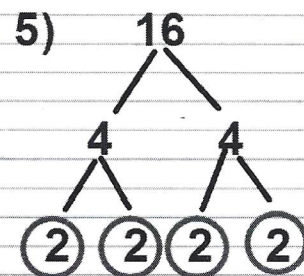
<b>Word</b>	<b>Definition</b>	<b>Example</b>
prime	a number that only has the factors 1 and itself	13 $1 \times 13 = 13$
composite	a number that has more factors than 1 and itself	15 $1 \times 15$ and $3 \times 5 = 15$
factor tree	a strategy to find the prime factorization of a number	 <pre>graph TD; 18 --- 2; 18 --- 9; 9 --- 3; 9 --- 3; style 2 stroke:#f00; style 3 stroke:#f00; style 3 stroke:#f00;</pre>
prime factorization	writing a composite number as a product of prime numbers	$2 \times 3 \times 3$ $2 \times 3^2$

Complete the following problems in your composition book.

Write the prime factorization for each number. Use a factor tree to help you.



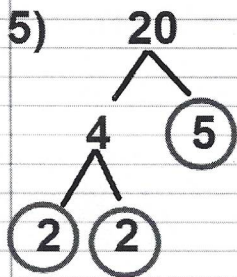
The prime factorization of 48 is  $2^4 \times 3$ .



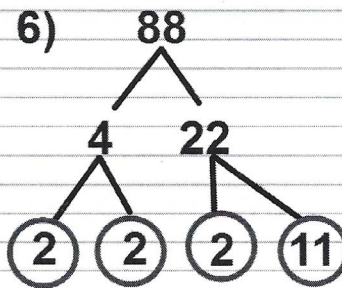
The prime factorization of 16 is  $2^4$ .



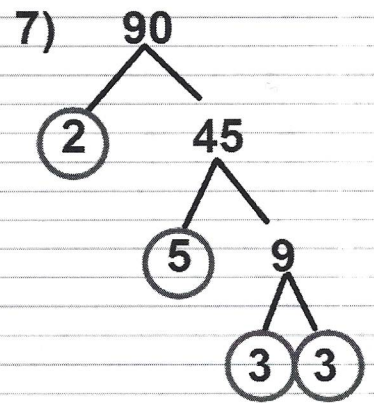
Complete problems 5-7 on your notes page.



$$2^2 \times 5$$



$$2^3 \times 11$$



$$2 \times 5 \times 3^2$$

Complete the following problems in your composition book.

Find the number represented by each prime factorization.

6)  $2^2 \cdot 3^2 \cdot 5$

7)  $2^2 \times 5^2 \times 7$

$(2 \times 2) \times (3 \times 3) \times 5$

$(2 \times 2) \times (5 \times 5) \times 7$

$4 \times 9 \times 5$

$4 \times 25 \times 7$

$36 \times 5$

$100 \times 7$

180

700



Complete problems 8-9 on your notes page.

Find the number represented by each prime factorization.

8)  $2^3 \times 3^2 \times 5$

$(2 \times 2 \times 2) \times (3 \times 3) \times 5$

$8 \times 9 \times 5$

$72 \times 5$

360

9)  $2 \times 3^3$

$2 \times (3 \times 3 \times 3)$

$2 \times 27$

54