

Greatest Common Factor

Short description: Learn how to find the greatest common factor of two numbers and how this can be used to solve problems with large numbers in this Math Shorts video.

Long description: In this video, learn how to find the greatest common factor of two numbers. Then, see how this can be used to solve problems with large numbers. In the accompanying classroom activity, students learn to find prime factors using factor trees. They then learn how prime factors, a Venn diagram, and simple multiplication can help them find the greatest common factor of two numbers. The lesson challenges students to find the greatest common factor of increasingly large numbers. It also pushes them to think about how prime factors are the building blocks of composite numbers.

Activity Text

Learning Outcomes

Students will be able to

- find the prime factors of any number up to 100
- find the greatest common factor of two numbers

Common Core State Standards: 6.NS.B.4

Vocabulary: Whole factors, prime factors, multiplicative, composite numbers, factor tree, Venn diagram, greatest common factor, distributive property

Materials: Small Post-it notes, Finding the Greatest Common Factor worksheet

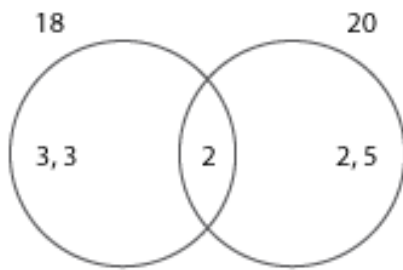
Procedure

1. Introduction (10 minutes, whole group)

Begin the lesson by telling students that every number can be expressed as a product of *whole factors*. For example, 6 can be written as 1×6 or 2×3 . The factors 2 and 3 are called *prime factors*, because their factors are only themselves and 1. Prime factors are important because they are the *multiplicative* building blocks of numbers, and they can help you find factors that two *composite numbers* have in common.

Tell students that one way to find prime factors is to create a *factor tree*. Write 18 and 20 on the board and build a factor tree for each number. List the prime factors underneath each number.

Now, show students how to place the prime factors for 18 and 20 inside a *Venn diagram*. The overlapping section will contain 2, the prime factor that 18 and 20 have in common. This is the *greatest common factor*, that is, the largest number that is a factor of both 18 and 20.



Reinforce the idea that prime factors are building blocks of numbers and that these building blocks can be assembled to create other factors. The prime factors of 18 are 3, 3, and 2, so $3 \times 2 = 6$ and $3 \times 3 = 9$ are factors as well—though not prime. This is a key idea leading into the activity.

2. Activity (15 minutes, pairs)

In this activity, students develop a method for finding the greatest common factor of any two numbers.

Pass out the worksheet and Post-it notes. Tell students to build factor trees out of the Post-it notes (one factor per Post-it). When they have completed the factor trees, they should transfer the prime factors to the Venn diagram and find the greatest common factor, which they can record on the worksheet.

As students work together, circulate through the room and observe students' thinking. Push them to think about other factors that can be created from the prime factors. Where necessary, help students understand that the greatest common factor of two numbers can be found by multiplying together all of the numbers' prime common factors.

3. Discussion (5 minutes, whole group)

Ask students to describe the method they used for finding the greatest common factor of two numbers and then have them model that method using two numbers. Ask how they would find the greatest common factor for three numbers, and then for four numbers.

4. Watch the Video (5 minutes, whole group)

Show students the video. Demonstrate to students how $18 + 20$ can be written by applying the *distributive property*: $2(9 + 10)$, where 2 is the greatest common factor and 9 and 10 are the largest remaining, noncommon factors of 18 and 20.