Grade 5: Mathematics

Finding the GCF

This resource can be used to plan an individual mathematics lesson or a unit of study. The suggested activities can be used in the order presented here, or they can be adapted for your lesson plan and classroom.

ClickView Miniclips

CURRICULUM OBJECTIVES

VIDEO OUTCOMES

Mathematics / Number and Operations in Base Ten

Find all factor pairs for a whole number in the range 1-100.

Recognize that a whole number is a multiple of each of its factors.

Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.

Find the greatest common factor of two whole numbers less than or equal to 100.

TEACHER PACK OUTCOMES

Mathematics / Number and Operations in Base Ten

Find all factor pairs for a whole number in the range 1-100.

Recognize that a whole number is a multiple of each of its factors.

Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.

Find the greatest common factor of two whole numbers less than or equal to 100.

Activity	Resources	Outcomes
<u>Activity 1: The Facts about Factors</u> **Timeframe:** 25 minutes **Lesson overview:** Students will review the concept of factors and be introduced to the concept of the greatest common factor (GCF). Activate students' prior knowledge by discussing what factors are. You may choose to watch the ClickView Miniclip *Factoring in Multiples*. Based on the Miniclip video, discuss how factors and multiples are connected to each other. Then, introduce the concept of the **greatest common factor (GCF)**. Tell students that the greatest common factor can only be calculated using two or more numbers. Ask students to discuss in their table groups: • What do you think the "greatest common factor" is? • How do you think this concept fits within factors and multiples? After five minutes of brainstorming, encourage each table group to share their thoughts about greatest common factors. As a whole class, watch the ClickView Miniclip *Finding the GCF*. After viewing the video, ask students to explain their understanding of greatest common factors. Each student is to write their own definition of the concept to explain their understanding in their notebooks. *Definition: A greatest common factor is the highest number that can be divided exactly into each of two or more numbers.*	ClickView Miniclip - *Factoring in Multiples* Smartboard / Digital display ClickView Miniclip - *Finding the GCF* Mathematics notebook	Students will: • Find all factor pairs for a whole number in the range 1-100. • Recognize that a whole number is a multiple of each of its factors. • Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.

Activity	Resources	Outcomes

Activity 2: Ringmaster
Timeframe: 40 minutes
Lesson overview: Students use hula hoops to create common factor rings to help them calculate the greatest common factors of number pairs.

> **Note:** Before beginning this activity, print, cut out, and laminate the *Ringmaster Number Cards*. Cut these up and distribute sets of them to each pair according to ability.

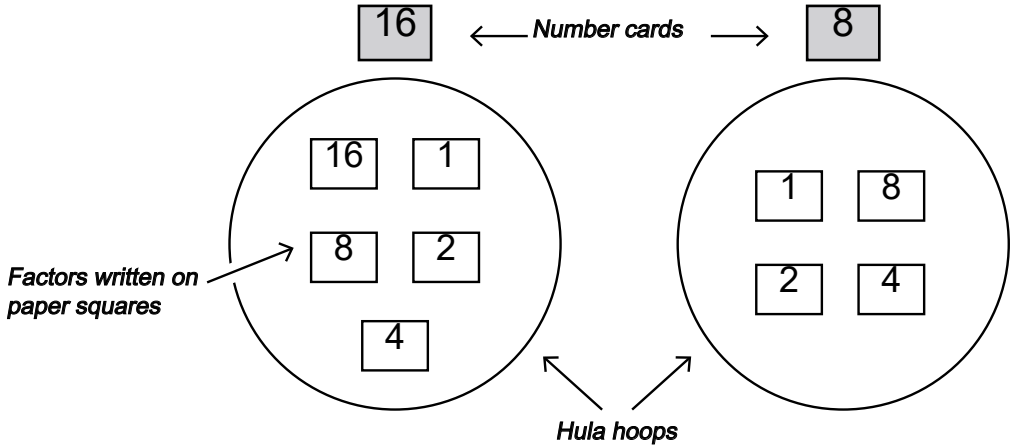
Rewatch the ClickView Miniclip *Finding the GCF*.

Divide the class into pairs and distribute a copy of the *Ringmaster* worksheet to each student.

Each pair receives two hula hoops, a set of number cards (two cards in each set), and a small bundle of cut up paper squares to write factors on. Each pair should find a clear space either in the classroom or outside.

Students are to lay the hula hoops down on the ground with no overlapping area. Students will then place a number card above each hula hoop.

Students are to identify the factors for each number on the card above the hula hoop. They are to write each factor on a paper square and place them in the appropriate hula hoop. They must identify and write down all factors for each number.



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ClickView Miniclip - *Finding the GCF*

Smartboard / Digital display

Ringmaster Number Cards (cut out and laminated)

Ringmaster worksheet

2 x hula hoops per pair

Cleared space in classroom or outside

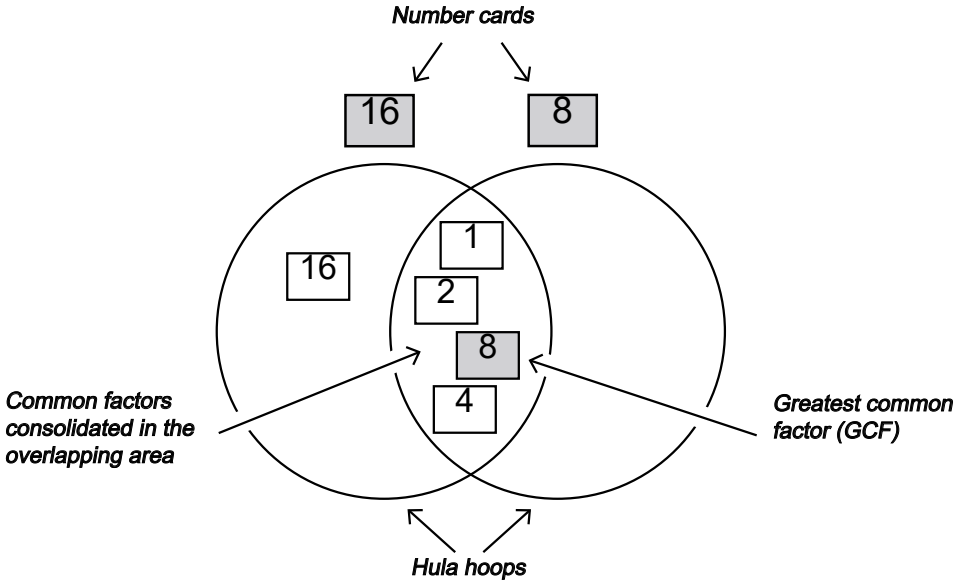
Bundles of cut up paper squares

Writing materials

Students will:
- Find all factor pairs for a whole number in the range 1-100.
- Recognize that a whole number is a multiple of each of its factors.
- Find the greatest common factor of two whole numbers less than or equal to 100.

Once all factors have been identified and written down, each pair of students are to identify the common factors both numbers share.

They should move the hula hoops together so that there is a small overlapping area in the middle, similar to a Venn diagram. Within this overlapping area, students are to place the paper squares with the common factors written on them.



Based on these common factors, the students are to identify the greatest common factor.

Students are to write down all their calculations and observations on the *Ringmaster* worksheet.

Repeat this activity with new number cards for as long as desired. While there are multiple sets of numbers in the *Ringmaster Number Cards,* you are encouraged to make more.

Activity	Resources	Outcomes

Activity 3: How Long Is a Piece of String?
Timeframe: 30 minutes
Lesson overview: Students will solve a problem involving different lengths of string without explicit instruction to calculate the GCF of two numbers.

Note: Prior to beginning this activity, organize various lengths string for each student. The length can be variable, but as a guide you can use 18 cm and 24 cm. To help students differentiate between the two pieces, you may choose to use two differently coloured threads (yarn could also be used here). Ensure you have spares so students can continue the activity even if they cut their string incorrectly.

Distribute the two precut pieces of string to each student. Challenge them with the following question:

> *You have two pieces of string – one is 18 cm and one is 24 cm long. How can you cut them up into smaller equal pieces without leftovers? All pieces must be the same length.*
> *What is the greatest length you can make with them?*

Allow students to solve the problem without teacher guidance. They may choose to solve the problem independently or with the help of the rest of their table group. Encourage discussion and critical thinking to solve the problem. Some students may recognize that they can solve this problem by using greatest common factors but others may not.

Once students believe they have solved the problem, come together as a class and discuss the thinking process students undertook.

- How many students recognized that they could solve the problem by calculating the GCF of 18 and 24?
- Did anybody solve the problem without calculating the GCF of the two string lengths?
- Were there similarities and differences with students' answers?
- Did anybody correctly solve the problem?

Answer: The longest length that can be made using the 18 cm and 24 cm pieces of strings equally is 6 cm. 6 is the greatest common factor of 18 and 24.

String

Scissors

Ruler

Mathematics notebook

Writing materials

Students will:

- Find all factor pairs for a whole number in the range 1-100.
- Find the greatest common factor of two whole numbers less than or equal to 100.

Activity	Resources	Outcomes
<u>Activity 4: GCF in the Real World</u> **Timeframe:** 20 minutes **Lesson overview:** Students will complete a worksheet involving real world scenarios by finding the GCF of two values.		
Begin a discussion about greatest common factors and when we might use them in real life. Many student might not recognize that this concept is useful beyond the classroom, so it is important to highlight times when students might need to know how to calculate an GCF. Distribute a copy of the *GCF in Everyday Life* worksheet to each student. These real world word problems will allow students to recognize when they might use GCF in their everyday life. Once students complete the worksheets, encourage them to come up with their own word problem and challenge a friend to solve it.	*GCF in Everyday Life* worksheet	Students will: • Find all factor pairs for a whole number in the range 1-100. • Find the greatest common factor of two whole numbers less than or equal to 100.

Activity	Resources	Outcomes
Activity 5: A Race for the GCF **Timeframe:** 30 minutes **Lesson overview:** Students compete against each other in a race to calculate and recognize the greatest common factor of two numbers. **Note:** Before beginning this activity, organize multiple pairs of number cards for students to use in each round. Two students are to be chosen as the players for the round. Each player receives a number card. Each player should privately look at their number card first for a few seconds. The players will then flip their number cards to show each other simultaneously. Once both the number cards have been flipped, the first student to calculate and recognize the greatest common factor of the two numbers wins the round. They can use the board or a notebook to record their calculations. Once they have their answer, they should shout it out. Nobody from the crowd can provide hints. The player who wins the round remains standing, while the losing player is replaced with a new student. For the next round, two new number cards are used. Repeat this game for as long as desired.	Number cards (these number cards can be from **Activity 2: Ringmaster** or personalised ones) Smartboard / Digital display **OR** Mathematics notebooks	Students will: • Find all factor pairs for a whole number in the range 1-100. • Find the greatest common factor of two whole numbers less than or equal to 100.

Activity	Resources	Outcomes
Activity 6: Interactive Video **Timeframe:** 15 minutes **Lesson overview:** Students will watch the ClickView Miniclip and answer the interactive questions to show their understanding of finding the greatest common factor. ClickView has created an interactive video lesson to accompany the ClickView Miniclip *Finding the GCF.* It includes a range of question types such as multiple choice, missing word, and true or false. You can assign the interactive video to your students to do at any suitable point in your unit. Alternatively, you can edit the premade questions to suit your students or create your own interactive video. To share the interactive video with your students, follow these steps: 1. Search for the Miniclip *Finding the GCF* that has the interactive logo (Interactive). 2. Click to view the video. 3. Click on the "Interactive videos" tab beneath the video. 4. Click the "Print as Worksheet" OR "Save to Workspace" button on the interactive video. 5. If you click "Save to Workspace", you can either click "Share with your students" or access it via your Workspace. • If you choose "Share with your students", copy the link and send it to your students. • Otherwise go to your Workspace, select the "Interactive videos" folder, and click "Share" to access the link and send to students. Students can watch and answer the interactive questions either in class or at home. Their results will be collated for you to view from your Workspace. The following guides are available if you require assistance: Creating an interactive video www.clickviewsupport.com/hc/en-us/articles/115005656528-PB202 How do I share an interactive video? www.clickviewsupport.com/hc/en-us/articles/115005496667-PB208 How do I make my interactive video private/public? www.clickviewsupport.com/hc/en-us/articles/115005494867-PB206	Smartboard / Digital display or 1:1 device with Internet connection Interactive video for the ClickView Miniclip – *Finding the GCF*	Assessment