Whole Numbers and Decimals

Lesson 9 Greatest Common Factors

Standards 6.NS.B.4a

Learning target I can find the greatest common factor and interpret equal groups.

Materials Place-value chart, graph paper for long division, pencils.

Lesson Flow 50 Minutes

0–5 Activate prior knowledge. Read the learning target. Ask students what they already know about greatest common factors. Use a quick model or estimate to make their starting ideas visible.

5–17 Teach and model. List factor pairs or use prime factorizations. The greatest factor shared by both numbers is the GCF. For identical kits with no leftovers, the GCF gives the greatest number of kits. Work through the two examples on the attached instruction page. Have students name the first step before showing it.

17–22 Guided practice. Revisit worked Example 2 with its solution covered. Students propose the next step and explain why it is valid; uncover and compare with the worked solution.

22–45 Independent classwork. Assign the attached 10 questions in order. Check items 1–3 for entry-level understanding, 4–6 for connected procedures, 7–8 for representation and explanation, and 9–10 for application or justification. Ask students to use the instruction-page notes area or extra grids for longer work.

45–50 Check understanding. Use classwork question 10 as an exit discussion: Make the greatest possible number of identical kits from 12 pencils and 18 erasers with no leftovers. Find the number of kits and each kit’s contents. Compare the result with the answer key and ask a student to defend the method.

Support and Extension

Support Model item 1 together with the listed tools, then have students attempt item 2 independently. Watch decimal place alignment, quotient zero digits, and the difference between GCF and LCM.

Extension Ask students to solve a final item another way, draw a second representation, or create a related problem with a checked answer.

Next step Record which students can explain the target independently. Begin the next teaching session with a brief correction for any recurring error.

Name _____ Date _____

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Learn and Discuss

List factor pairs or use prime factorizations. The greatest factor shared by both numbers is the GCF. For identical kits with no leftovers, the GCF gives the greatest number of kits.

Example 1 Find the GCF of 12 and 16. Show factor pairs or prime factors.
Solution 4. Common factors: 1, 2, 4; greatest is 4.
Example 2 Make the greatest possible number of identical kits from 18 pencils and 30 erasers with no leftovers. Find the number of kits and each kit's contents.
Solution 6 kits; 3 pencils and 5 erasers each. GCF(18, 30) = 6; divide both counts by 6.

Classwork Show Your Work

Complete the 10 problems on the following page. Refer to the examples, draw models, and check your results.

My Notes or Second Method

Lesson 9 Greatest Common Factors

Name _____ Show calculations, models, and units.

1. Find the GCF of 12 and 16. Show factor pairs or prime factors.

2. Find the GCF of 8 and 12. Show factor pairs or prime factors.

3. Find the GCF of 10 and 15. Show factor pairs or prime factors.

4. Find the GCF of 45 and 60. Show factor pairs or prime factors.

5. Find the GCF of 24 and 36. Show factor pairs or prime factors.

6. Find the GCF of 18 and 30. Show factor pairs or prime factors.

7. Make the greatest possible number of identical kits from 60 pencils and 84 erasers with no leftovers. Find the number of kits and each kit’s contents.

8. Make the greatest possible number of identical kits from 48 pencils and 72 erasers with no leftovers. Find the number of kits and each kit’s contents.

9. Make the greatest possible number of identical kits from 70 pencils and 100 erasers with no leftovers. Find the number of kits and each kit’s contents.

10. Make the greatest possible number of identical kits from 12 pencils and 18 erasers with no leftovers. Find the number of kits and each kit’s contents.

Greatest Common Factors

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1. 4
Reasoning Common factors: 1, 2, 4; greatest is 4.

2. 4
Reasoning Common factors: 1, 2, 4; greatest is 4.

3. 5
Reasoning Common factors: 1, 5; greatest is 5.

4. 15
Reasoning Common factors: 1, 3, 5, 15; greatest is 15.

5. 12
Reasoning Common factors: 1, 2, 3, 4, 6, 12; greatest is 12.

6. 6
Reasoning Common factors: 1, 2, 3, 6; greatest is 6.

7. 12 kits; 5 pencils and 7 erasers each
Reasoning GCF(60, 84) = 12; divide both counts by 12.

8. 24 kits; 2 pencils and 3 erasers each
Reasoning GCF(48, 72) = 24; divide both counts by 24.

9. 10 kits; 7 pencils and 10 erasers each
Reasoning GCF(70, 100) = 10; divide both counts by 10.

10. 6 kits; 2 pencils and 3 erasers each
Reasoning GCF(12, 18) = 6; divide both counts by 6.