SIMPLIFY RATIOS

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Simplify a ratio by dividing both numbers by the same number.

8 squares and 12 circles make 4 equal groups of 2 squares and 3 circles.



÷ 4 (8 : 12 / 2 : 3) ÷ 4

1 Write the factors of each number. Then find the highest common factor.

a) Factors of 9: ☐ ☐ ☐

b) Factors of 15: ☐ ☐ ☐ ☐

c) The highest common factor (HCF) of 9 and 15 is ☐

2 Use the groups to simplify each ratio.

a)  4 : 8 = 1 : ☐

b)  6 : 4 = ☐ : ☐

3 Divide both numbers by 2.

÷ 2 (10 : 14 / ☐ : ☐) ÷ 2 ÷ 2 (6 : 20 / ☐ : ☐) ÷ 2 ÷ 2 (18 : 8 / ☐ : ☐) ÷ 2

4 Draw a line to match each ratio to its simplest form.

2 : 4 •	• 2 : 3
9 : 3 •	• 1 : 4
10 : 15 •	• 1 : 2
4 : 16 •	• 3 : 1

SIMPLIFY RATIOS

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Divide both numbers by the highest common factor (HCF).

The HCF of 15 and 20 is 5.

3 : 4 is in its simplest form because the only common factor of 3 and 4 is 1.

15 : 20 → (÷ 5) → 3 : 4 (÷ 5)

1 Simplify each ratio.

12 : 16 (÷ 4) → ☐ : ☐ (÷ 4)

25 : 10 (÷ 5) → ☐ : ☐ (÷ 5)

18 : 27 (÷ 9) → ☐ : ☐ (÷ 9)

2 Find the HCF. Then write each ratio in its simplest form.

a) 14 : 21 HCF = ☐ Simplest form: ☐ : ☐

b) 24 : 40 HCF = ☐ Simplest form: ☐ : ☐

c) 32 : 12 HCF = ☐ Simplest form: ☐ : ☐

3 Here are some squares and circles.



a) squares : circles = ☐ : ☐

b) simplest form = ☐ : ☐

4 Simplify each ratio. Fill in what you divide by.

☐ (6 : 12 : 18) → ☐ : ☐ : ☐ ☐

☐ (10 : 20 : 25) → ☐ : ☐ : ☐ ☐

SIMPLIFY RATIOS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Divide every number by the HCF. With units, change to the same unit first, e.g. £1 : 40p = 100 : 40 = 5 : 2.

FLUENCY

1 Write each ratio in its simplest form.

a) 35 : 56 ☐ : ☐

b) 48 : 18 ☐ : ☐

c) 9 : 42 ☐ : ☐

d) 140 : 84 ☐ : ☐

e) 27 : 45 : 63 ☐ : ☐ : ☐

f) 0.6 : 1.5 ☐ : ☐

2 Write each ratio in its simplest form. Change to the same units first.

a) £3 : 75p ☐ : ☐

b) 2 m : 40 cm ☐ : ☐

c) 1.5 kg : 600 g ☐ : ☐

d) 45 minutes : 2 hours ☐ : ☐

REASONING

3 Liv simplifies 24 : 60 to 12 : 30. Jas simplifies 24 : 60 to 2 : 5. Who is correct? Explain.

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4 Ravi says, "15 : 21 cannot be simplified, because 15 and 21 are both odd." Is Ravi correct? Convince me.

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SIMPLIFY RATIOS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) If both numbers are even, the ratio can be simplified. ALWAYS SOMETIMES NEVER

b) If both numbers are odd, it is in simplest form. ALWAYS SOMETIMES NEVER

c) A ratio of two prime numbers is in simplest form. ALWAYS SOMETIMES NEVER

d) Simplifying changes the total number of parts. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Write each ratio in its simplest form.

a) 35% of a club's members are under 12. Under-12s : others = ☐ : ☐

b) A room is 3.6 m long and 90 cm wide. Length : width = ☐ : ☐

3 Write three different ratios that simplify to 3 : 7, where the first number is between 40 and 50.

☐ : ☐ ☐ : ☐ ☐ : ☐

★ CHALLENGE FOR ALL

4 Find each missing value.

a) x : 24 simplifies to 5 : 8. x = ☐

b) 18 : y simplifies to 3 : 7. y = ☐

c) (n + 3) : 15 simplifies to 2 : 3. n = ☐

d) a : b simplifies to 2 : 5 and a + b = 63. a = ☐ b = ☐

STEP 5 ANSWERS – SIMPLIFY RATIOS

ANSWERS

BUILDING BLOCKS

1 a) 1, 3, 9 · b) 1, 3, 5, 15 · c) 3

2 a) 4 : 8 = 1 : 2 · b) 6 : 4 = 3 : 2

3 10 : 14 = 5 : 7 · 6 : 20 = 3 : 10 · 18 : 8 = 9 : 4

4 2 : 4 → 1 : 2 · 9 : 3 → 3 : 1 · 10 : 15 → 2 : 3 · 4 : 16 → 1 : 4

SUPPORT

1 12 : 16 = 3 : 4 · 25 : 10 = 5 : 2 · 18 : 27 = 2 : 3

2 a) HCF 7, 2 : 3 · b) HCF 8, 3 : 5 · c) HCF 4, 8 : 3

3 a) 12 : 8 · b) 3 : 2

4 6 : 12 : 18 ÷ 6 = 1 : 2 : 3 · 10 : 20 : 25 ÷ 5 = 2 : 4 : 5

CORE

1 a) 5 : 8 · b) 8 : 3 · c) 3 : 14 · d) 5 : 3 · e) 3 : 5 : 7 · f) 2 : 5

2 a) 300 : 75 = 4 : 1 · b) 200 : 40 = 5 : 1 · c) 1500 : 600 = 5 : 2 · d) 45 : 120 = 3 : 8

3 Both are equivalent to 24 : 60, but only Jas has the simplest form. 12 and 30 still share the factor 6; dividing 24 : 60 by the HCF 12 gives 2 : 5.

4 No. Odd numbers can share a factor: 15 and 21 have a common factor of 3, so 15 : 21 = 5 : 7.

GREATER DEPTH

1 a) Always (both divide by 2) · b) Sometimes – 3 : 5 yes, 9 : 15 no · c) Sometimes – 3 : 5 yes, 7 : 7 = 1 : 1 no · d) Sometimes – 4 : 6 (10 parts) becomes 2 : 3 (5 parts); 2 : 3 is unchanged

2 a) 35 : 65 = 7 : 13 · b) 360 : 90 = 4 : 1

3 42 : 98, 45 : 105 and 48 : 112

4 a) 15 · b) 42 · c) 7 · d) a = 18, b = 45