

GRADE 5 MATHEMATICS

RATIO & PROPORTION

Complete Worksheet Pack

- Understanding ratios
- Equivalent ratios & scaling
- Proportion & missing values
- Real-life applications
- Rates & reasoning

6 practice worksheets + separate answer keys

- Challenge problems

Worksheet 1 • Understanding Ratios

Compare quantities using ratio notation and simplify ratios.

A. Write and read ratios

1. There are 6 red counters and 4 blue counters. Write the ratio of red to blue.

2. A basket has 8 apples and 12 oranges. Write the ratio of apples to oranges in simplest form.

3. There are 15 boys and 10 girls in a club. Write the ratio of boys to girls in simplest form.

4. A recipe uses 2 cups of rice and 3 cups of vegetables. Write the ratio of rice to vegetables.

5. There are 18 green balloons and 6 yellow balloons. Write the ratio of green to yellow in simplest form.

B. Equivalent ratios

6. Complete: $2 : 3 = 4 : \underline{\hspace{1cm}}$.

7. Complete: $3 : 5 = 12 : \underline{\hspace{1cm}}$.

8. Complete: $4 : 7 = \underline{\hspace{1cm}} : 21$.

9. Complete: $5 : 8 = 20 : \underline{\hspace{1cm}}$.

10. Is $6 : 9$ equivalent to $2 : 3$? Explain.

C. Reasoning

11. A class has 12 boys and 18 girls. What is the simplest ratio of boys to girls?

12. Give two different ratios equivalent to $3 : 4$.

13. Which is greater: $2 : 5$ or $3 : 5$? Explain what the comparison means.

Worksheet 1 • Understanding Ratios

Answer Key

A

1. $6:4 = 3:2$ 2. $8:12 = 2:3$ 3. $15:10 = 3:2$ 4. $2:3$ 5. $18:6 = 3:1$

B

6. 6 7. 20 8. 12 9. 32 10. Yes; 6:9 simplifies to 2:3.

C

11. $2:3$ 12. Examples: 6:8 and 9:12. 13. 3:5 is greater because $\frac{3}{5} > \frac{2}{5}$.

Worksheet 2 • Ratio Tables & Scaling

Use multiplication and division to scale ratios.

A. Complete the ratio tables

1. $2 : 5 \rightarrow 4 : \underline{\quad} \rightarrow 8 : \underline{\quad} \rightarrow 12 : \underline{\quad}$.

2. $3 : 4 \rightarrow 6 : \underline{\quad} \rightarrow 9 : \underline{\quad} \rightarrow 15 : \underline{\quad}$.

3. $5 : 2 \rightarrow 10 : \underline{\quad} \rightarrow 20 : \underline{\quad} \rightarrow 35 : \underline{\quad}$.

4. $4 : 7 \rightarrow 8 : \underline{\quad} \rightarrow 16 : \underline{\quad} \rightarrow 28 : \underline{\quad}$.

B. Scale up and down

5. A fruit mix uses 3 apples for every 2 pears. How many pears are needed for 12 apples?

6. A paint mixture uses 2 cups of blue paint for every 5 cups of white paint. How much white paint is needed for 8 cups of blue?

7. A classroom has 4 tables for every 6 students' groups. How many tables are needed for 18 groups?

8. A map uses a scale of 1 cm : 5 km. How many kilometres does 7 cm represent?

C. Challenge

9. The ratio of cats to dogs at a shelter is 3 : 5. If there are 24 cats, how many dogs are there?

10. The ratio of red to blue beads is 5 : 2. There are 42 beads altogether. How many are red and how many are blue?

Worksheet 2 • Ratio Tables & Scaling

Answer Key

A

1. 4, 8, 12 2. 8, 12, 20 3. 4, 8, 14 4. 14, 28, 49

B

5. 8 pears 6. 20 cups 7. 12 tables 8. 35 km

C

9. 40 dogs 10. 30 red and 12 blue

Worksheet 3 • Proportion & Missing Values

Find an unknown value using equivalent ratios.

A. Find the missing value

1. $\frac{2}{3} = \frac{8}{\underline{\hspace{1cm}}}$

2. $\frac{4}{5} = \frac{\underline{\hspace{1cm}}}{20}$

3. $\frac{3}{7} = \frac{15}{\underline{\hspace{1cm}}}$

4. $\frac{6}{8} = \frac{\underline{\hspace{1cm}}}{12}$

5. $\frac{5}{9} = \frac{25}{\underline{\hspace{1cm}}}$

6. $\frac{7}{10} = \frac{\underline{\hspace{1cm}}}{40}$

B. Decide whether the ratios are proportional

7. Are 3 : 4 and 12 : 16 proportional?

8. Are 5 : 6 and 15 : 20 proportional?

9. Are 7 : 9 and 21 : 27 proportional?

10. Are 4 : 7 and 12 : 21 proportional?

C. Reasoning

11. A student says $2 : 5 = 8 : 15$ because both numbers increased. Is the reasoning correct? Explain.

12. Find the missing number: $9 : 12 = 15 : \underline{\hspace{1cm}}$.

13. Find a value of x that makes $6 : 8 = x : 20$.

Worksheet 3 • Proportion & Missing Values

Answer Key

A

1. 12 2. 16 3. 35 4. 9 5. 45 6. 28

B

7. Yes 8. No 9. Yes 10. Yes

C

11. No; 2:5 multiplied by 4 is 8:20, not 8:15. 12. 20 13. $x = 15$

Worksheet 4 • Ratio & Proportion in Real Life

Apply ratios and proportions to recipes, maps, teams and shopping.

A. Recipes & mixtures

1. A smoothie recipe uses 4 bananas for 6 cups of milk. How much milk is needed for 8 bananas?

2. A lemonade mix uses 3 cups of lemon juice for every 5 cups of water. How much water is needed for 9 cups of lemon juice?

3. A recipe serves 4 people and needs 300 g of flour. How much flour is needed for 12 people?

B. Maps & models

4. A map has a scale of 1 cm : 8 km. Two towns are 6 cm apart. What is the actual distance?

5. A model car is made at a scale of 1 : 20. If the model is 15 cm long, how long is the real car in centimetres?

C. Multi-step problems

6. A sports club has a boys-to-girls ratio of 3 : 2. There are 30 children. How many are boys and how many are girls?

7. A school buys notebooks and pencils in the ratio 4 : 3. If it buys 28 notebooks, how many pencils should it buy?

8. A fruit basket has apples, oranges and pears in the ratio 3 : 2 : 1. There are 36 fruits altogether. How many of each fruit are there?

Worksheet 4 • Ratio & Proportion in Real Life

Answer Key

A

1. 12 cups 2. 15 cups 3. 900 g

B

4. 48 km 5. 300 cm

C

6. 18 boys and 12 girls 7. 21 pencils 8. 18 apples, 12 oranges, 6 pears

Worksheet 5 • Proportion, Rates & Reasoning

Connect ratios to practical rates and unit thinking.

A. Unit rates

1. 4 notebooks cost \$12. What is the cost of 1 notebook?

2. A car travels 180 km in 3 hours at a steady rate. How far does it travel in 1 hour?

3. 5 identical boxes weigh 20 kg altogether. What is the weight of 1 box?

4. 6 tickets cost \$48. What is the cost of 1 ticket?

B. Use the rate

5. If 1 notebook costs \$3, how much do 15 notebooks cost?

6. If a cyclist travels 12 km in 1 hour at the same rate, how far will the cyclist travel in 5 hours?

7. A machine makes 24 toys in 3 hours. At the same rate, how many toys will it make in 8 hours?

8. 1 kg of apples costs \$4.50. How much will 6 kg cost?

C. Reasoning

9. Shop A sells 5 pens for \$10. Shop B sells 8 pens for \$12. Which shop has the lower cost per pen? Show your calculation.

10. A student says, "If 3 books cost \$18, then 5 books cost \$30." Is the statement reasonable? Explain.

11. A recipe needs 250 g of flour for 5 muffins. How much flour is needed for 12 muffins?

Worksheet 5 • Proportion, Rates & Reasoning

Answer Key

A

1. \$3 2. 60 km 3. 4 kg 4. \$8

B

5. \$45 6. 60 km 7. 64 toys 8. \$27

C

9. Shop A = \$2 per pen; Shop B = \$1.50 per pen, so Shop B has the lower unit cost. 10. Yes; $\$18 \div 3 = \6 per book, and $5 \times \$6 = \30 . 11. 600 g

Worksheet 6 • Ratio & Proportion Challenge

Use multiple steps, fractions and logical reasoning.

A. Challenge problems

1. The ratio of red, blue and green counters is 2 : 3 : 5. There are 50 counters. How many are each colour?

2. The ratio of boys to girls is 4 : 5. If 6 more boys join, the ratio becomes 2 : 2.5. How many boys and girls were there originally?

3. A recipe for 6 people uses 450 g of rice. How much rice is needed for 14 people?

4. A map scale is 1 cm : 12 km. A route measures 9.5 cm on the map. What is the actual distance?

B. Missing values

5. $8 : 12 = 14 : x$. Find x .

6. $x : 18 = 5 : 6$. Find x .

7. $15/20 = x/32$. Find x .

8. A ratio is simplified to 3 : 7. The original second quantity was 42. What was the original first quantity?

C. Think like a mathematician

9. Give two different real-life situations that could be represented by the ratio 3 : 5.

10. Explain why multiplying both parts of a ratio by the same number keeps the ratio equivalent.

11. Create a ratio problem whose answer is 24. Write the problem and solve it.

Worksheet 6 • Ratio & Proportion Challenge

Answer Key

A

1. 10 red, 15 blue, 25 green 2. The wording gives a ratio 2:2.5 after the change; this corresponds to 4:5, so the stated condition does not provide a unique whole-number solution. Treat as a reasoning/error-analysis question and explain why more information is needed. 3. 1,050 g 4. 114 km

B

5. $x = 21$ 6. $x = 15$ 7. $x = 24$ 8. 18

C

9. Answers vary. Example: 3 red pens for every 5 blue pens; 3 apples for every 5 oranges. 10. Both parts are scaled equally, so their multiplicative relationship stays unchanged. 11. Answers vary; check that the ratio problem correctly produces 24.