

# Table of contents

Program overview . . . . .	6
<i>Solve</i> <sup>®</sup> overview . . . . .	8
Pacing charts . . . . .	10
The Australian Curriculum . . . . .	13
Features of a <i>Solve</i> <sup>®</sup> practice . . . . .	14
Scope and sequence chart. . . . .	20

## PART 1 LESSON PLANS

### Fractions

---

<b>Practice 1</b>	Multiply whole numbers by fractions . . . . .	23
<b>Practice 2</b>	Multiply fractions . . . . .	26
<b>Practice 3</b>	Divide whole numbers by fractions . . . . .	29
<b>Practice 4</b>	Divide fractions by fractions . . . . .	32
<b>Reviews 1–2</b>	Practices 1–4 . . . . .	35

### Decimals

---

<b>Practice 5</b>	Multiply and divide by powers of ten . . . . .	38
<b>Practice 6</b>	Multiply decimals . . . . .	41
<b>Practice 7</b>	Divide decimals by whole numbers . . . . .	44
<b>Practice 8</b>	Divide by decimals . . . . .	47
<b>Reviews 3–4</b>	Practices 5–8 . . . . .	50

### Ratios and proportional relationships

---

<b>Practice 9</b>	Understand ratios . . . . .	53
<b>Practice 10</b>	Understand percentage . . . . .	56
<b>Practice 11</b>	Unit rates . . . . .	59

**Expressions and equations**

---

<b>Practice 12</b>	<b>Ratios in tables of data</b> . . . . .	62
<b>Reviews 5–6</b>	Practices 9–12 . . . . .	65
<b>Practice 13</b>	<b>Solve equations using number sense</b> . . . . .	68
<b>Practice 14</b>	<b>Solve equations using inverse operations</b> . . . . .	71
<b>Practice 15</b>	<b>Use formulas</b> . . . . .	74

**Surface area and volume**

---

<b>Practice 16</b>	<b>Volume</b> . . . . .	77
<b>Reviews 7–8</b>	Practices 13–16 . . . . .	80

**PART 2 LESSON PLANS FOR ADDITIONAL PRACTICE**

**Integers** *(Can be used after Practice 8)*

---

<b>Practice 17</b>	<b>Understand integers</b> . . . . .	85
--------------------	--------------------------------------	----

**Statistics** *(Can be used after Practice 7)*

---

<b>Practice 18</b>	<b>Mean, median, range</b> . . . . .	88
--------------------	--------------------------------------	----

<b>Reviews 9–10</b>	Practices 17 and 18 . . . . .	91
---------------------	-------------------------------	----

<b>INDIVIDUAL TRACKING CHART</b> <i>(Activity sheet)</i> . . . . .	94
--	----

# PRACTICE 1

Parts one and two

## MULTIPLY WHOLE NUMBERS BY FRACTIONS

### OBJECTIVES

In part one, students will:

- Use models and repeated addition to find the product of a whole number and a fraction.
- Analyse contextual problems involving multiplication of a whole number and a fraction.
- Connect a fraction model to a multiplication sentence.

In part two, students will:

- Multiply a whole number by a fraction, using a standard algorithm.
- Use mental maths to multiply a whole number by a fraction.
- Apply knowledge of multiplying a whole number by a fraction to solve contextual problems.

### VOCABULARY

Part one

- **repeated addition:** addition of the same number a particular number of times

Part two

- **numerator:** the top number in a fraction that tells the number of equal parts described by the fraction
- **denominator:** the bottom number in a fraction that tells the total number of equal parts in a whole
- **improper fraction:** a fraction whose numerator is greater than or equal to its denominator
- **mixed number:** a number containing whole and fraction parts

### AUSTRALIAN CURRICULUM CONTENT DESCRIPTIONS

See page 13 to cross-reference this lesson with aligned Australian Curriculum content descriptions

### RELATED STAMS® PLUS INSTRUCTION

For instruction that supports this practice, go to:



*STAMS® Plus*, Book F, Lesson 1,  
Multiply whole numbers by  
fractions, pp. 4–13

*STAMS®* IWB lessons, Level F, Visualise  
multiplying whole numbers by fractions

<http://iwb.camsandstams.com.au>



Use features such as interactive fraction models to deepen students' understanding of multiplying whole numbers by fractions.

**Part one**


**PRACTICE**  
**1**  
 Part one

**MULTIPLY WHOLE NUMBERS BY FRACTIONS**

Use models to solve the problem.

1. Find  $4 \times \frac{2}{3}$ .

$4 \times \frac{2}{3}$  means 4 groups of  $\frac{2}{3}$ .




Let's solve this together.

**Solution:**  $4 \times \frac{2}{3} = \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{8}{3} = 2\frac{2}{3}$

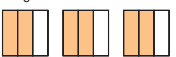
Solve each problem. Shade the models to find the answers. Write the solution.

2.  $2 \times \frac{4}{5}$



**Solution:**  $1\frac{3}{5}$

3.  $3 \times \frac{2}{3}$



**Solution:** 2

Solve each problem. Choose the best answer.

4.  $7 \times \frac{5}{9}$  means \_\_\_\_\_ groups of \_\_\_\_\_.

Ⓐ 7; 5      ● 7;  $\frac{5}{9}$   
 Ⓑ 5;  $\frac{7}{9}$       Ⓒ 9;  $\frac{5}{7}$

5. Amir practises piano for  $\frac{2}{3}$  hour each day. How long does he practise in 5 days?

Ⓐ  $1\frac{2}{3}$  hours      Ⓒ  $3\frac{2}{3}$  hours  
 ●  $3\frac{1}{3}$  hours      Ⓓ  $5\frac{2}{3}$  hours

© 2013 Hawker Brownlow Education • 9781760010386 • CA12948 5

Multiply whole numbers by fractions

**Solve each problem. Choose the best answer.**

6. Dorrie has 3 pieces of ribbon. Each ribbon is  $\frac{3}{4}$  of a metre long. How much ribbon does she have?

●  $2\frac{1}{4}$  metres      Ⓒ  $3\frac{3}{4}$  metres  
 Ⓑ  $2\frac{1}{2}$  metres      Ⓓ 4 metres

7. How can  $5 \times \frac{3}{8}$  be written using addition?

Ⓐ  $\frac{5}{8} + \frac{5}{8} + \frac{5}{8} + \frac{5}{8} + \frac{5}{8}$   
 Ⓑ  $5 + \frac{3}{8}$   
 ●  $\frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8}$   
 Ⓒ  $\frac{5}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8}$

8. Ian needs  $\frac{5}{8}$  cup of sugar to make one batch of biscuits. How much sugar does he need to make 3 batches of biscuits?

Ⓐ  $1\frac{5}{8}$  cups      Ⓒ  $2\frac{1}{8}$  cups  
 ●  $1\frac{7}{8}$  cups      Ⓓ  $3\frac{5}{8}$  cups

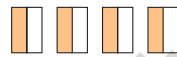
9. Katie fills bowls of yoghurt for her family. She puts  $\frac{3}{5}$  cup of yoghurt into each bowl. How much yoghurt does Katie use for 4 bowls?

Ⓐ  $2\frac{1}{5}$  cups      Ⓒ  $3\frac{4}{5}$  cups  
 ●  $2\frac{2}{5}$  cups      Ⓓ  $4\frac{3}{5}$  cups

**REASONING**

Solve the problem. Explain your thinking.

10. What multiplication problem is shown in the model? Find the product.



**Solution:**  $4 \times \frac{1}{2} = \frac{4}{2} = 2$

Each rectangle is shaded to show  $\frac{1}{2}$ , and there are 4 rectangles.

$4 \times \frac{1}{2} = \frac{4}{2} = 2$ , or 2.

CA12948 • 9781760010386 • © 2013 Hawker Brownlow Education 6

**At a Glance**

Students use models and repeated addition to multiply a whole number by a fraction. If students have difficulty, check for these common pitfalls and use the related tips to provide help.

**Solve Problems 2–3**

**If** If students answer  $\frac{4}{5}$  for problem 2, they may have shaded  $\frac{2}{5}$  of each model because they are misreading the problem.

**Then** Focus attention on each factor. Clarify that the whole number is the number of whole models and the fraction is the portion of each whole to shade.

**Solve Problems 4–9**

**If** Students who answer C for problem 8 may have simplified incorrectly, thinking that  $\frac{15}{8}$  is  $\frac{1}{8}$  more than 2.

**Then** Have students draw a model. Then review how to simplify fractions.

**Reasoning, Problem 10**

**If** If students do not know how to approach problem 10, they may not understand that the question connects the model to repeated addition.

**Then** Help students relate this problem to problem 1, which uses a repeated addition model to multiply a whole number and a fraction.

Part two

**PRACTICE**  
**1**  
 Part two

**MULTIPLY WHOLE NUMBERS BY FRACTIONS**

**Use multiplication to solve the problem.**

1. Multiply  $5 \times \frac{3}{4}$ .

$$5 \times \frac{3}{4} = \frac{5}{1} \times \frac{3}{4}$$

Write the whole number as a fraction.

$$= \frac{15}{4}$$

Multiply the **numerators**.  
Multiply the **denominators**.

$$= \frac{3}{4}$$

Write the improper fraction as a mixed number.

**Solution:**  $1\frac{3}{4}$

Let's solve this together.

When multiplying fractions by whole numbers:

- Rewrite whole numbers as fractions by putting a 1 in the denominator.
- If the answer is an **improper fraction**, then rewrite it as a **mixed number**.
- Simplify your answer.

**Solve the problem. Fill in the blanks.**

2.  $4 \times \frac{2}{7}$

$$4 \times \frac{2}{7} = \frac{4}{1} \times \frac{2}{7}$$

$$= \frac{8}{7}$$

$$= 1\frac{1}{7}$$

**MENTAL MATHS**      Multiply using mental maths.

3.  $3 \times \frac{3}{10} = \frac{9}{10}$

4.  $2 \times \frac{2}{5} = \frac{4}{5}$

5.  $5 \times \frac{1}{8} = \frac{5}{8}$

6.  $3 \times \frac{2}{11} = \frac{6}{11}$

© 2013 Hawker Brownlow Education • 9781760010393 • CA12948 7

Multiply whole numbers by fractions

**Solve each problem. Choose the best answer.**

7. Julie is making 6 bags of snack mix. She puts  $\frac{5}{8}$  of a kilogram of peanuts in each bag. How many kilograms of peanuts does she use?

$3\frac{3}{4}$  kilograms        $6\frac{5}{8}$  kilograms  
  $5\frac{1}{8}$  kilograms        $6\frac{3}{2}$  kilograms

8. Kristi is making bookshelves. If each bookshelf is  $\frac{7}{10}$  of a metre long, how much shelving will she need to make 5 shelves?

$2\frac{1}{2}$  metres        $3\frac{1}{2}$  metres  
  $2\frac{7}{10}$  metres        $5\frac{7}{10}$  metres

9. There are 9 students in the cooking club. If each student brings  $\frac{2}{5}$  of a kilogram of vegetables to make soup, how many kilograms of vegetables will they have?

$2\frac{4}{5}$  kilograms        $4\frac{1}{5}$  kilograms  
  $3\frac{3}{5}$  kilograms        $4\frac{1}{2}$  kilograms

10. A race car travels one kilometre in  $\frac{3}{8}$  minute. How long does it take the car to travel 8 kilometres?

$1\frac{3}{8}$  minutes       3 minutes  
  $1\frac{5}{8}$  minutes        $3\frac{3}{8}$  minutes

CA12948 • 9781760010393 • © 2013 Hawker Brownlow Education 8

**At a Glance**

Students multiply whole numbers and fractions, using a standard algorithm. If students have difficulty, check for these common pitfalls and use the related tips to provide help.

**Solve Problem 2**

**If** If students write  $\frac{1}{4}$  as one of the factors for problem 2, they may have incorrectly rewritten 4 as a fraction.

**Then** Use fraction circles to model  $\frac{1}{4}$  and  $\frac{4}{1}$ . Have students explain the meaning of the denominator of each.

**Mental Maths, Problems 3–6**

**If** If students answer  $\frac{5}{11}$  for problem 6, they may be adding numerators instead of multiplying.

**Then** Ask students to explain their reasoning. Remind them that repeated addition means adding  $\frac{2}{11}$  three times.

**Solve Problems 7–10**

**If** If students are unsure of which numbers to use for problem 10, they may not understand the meaning of the problem.

**Then** Have students draw a diagram of a road that is 8 kilometres long and is divided into 8 equal parts. Tell them to write “ $\frac{3}{8}$  minute” in each of the parts (kilometre). Ask them how long it takes the car to travel 8 kilometres.

**OBJECTIVES**

In review 1, students will:

- Solve word problems involving multiplication and division of fractions, whole numbers and mixed numbers.
- Analyse contextual problems, solve them and explain the reasoning in situations involving multiplication and division of fractions, whole numbers and mixed numbers.

In review 2, students will:

- Analyse and solve problems involving fractions, whole numbers and mixed numbers.
- Use mental maths to solve multiplication and division problems with fractions and whole numbers.
- Model problem situations with equations.
- Apply multiplication and division of fractions in the context of measuring everyday objects.

**AUSTRALIAN CURRICULUM  
CONTENT DESCRIPTIONS**

See page 13 to cross-reference this lesson with aligned Australian Curriculum content descriptions

© Hawker Brownlow Education

