

INTRODUCTION

Welcome to **Understanding Fractions Book 8**. This book has been designed for Year 8 students, although it may also be helpful in reinforcing fractional concepts for children who are experiencing some difficulties or providing more challenging activities and understandings for Year 7 students.

The activities in this book allow students to explore and play with fractional relationships and to come to their own understandings. Students are encouraged to analyse shapes, relationships and numbers. They are also encouraged to develop their skills in communicating, reasoning and problem solving.

Whereas the earlier levels in this series depend primarily upon visual input for students to construct a framework for understanding fractions, Book 8 directs students to self-discovery of the operational algorithms and the move from simpler to more complex fractions. Although the use of manipulatives is not required as much as in earlier levels, allow students to use whatever tools they may find helpful.

Your organisation of students may vary as you continue to use this resource. The tasks have been designed to be completed in small groups or pairs as the student exchange of ideas increases the power of learning as it uncovers a variety of problem solving strategies. Working together also allows students to answer one another's questions about the directions and concepts. You may, however, prefer that some tasks be completed individually. When this is the case, bring the students back together on completion of the task and share understandings and experiences. This will help you identify students who require further assistance and will also reinforce the skills that have been taught. Other students will be ready to expand on the concepts they have understood.

It is recommended that at the conclusion of each lesson, you focus more on discussion of students' results than correction of individual pages. Encourage students to focus more on their strategies than just on getting the right answer.

Assessment is multifaceted and this resource encourages a range of strategies for assessing students. Each lesson is part of this process. You can gather valuable information by listening to student's explanations, observing their thinking and examining their writing and reflections. These assessment tools are some methods of exploring student progress and modifying instruction to suit the needs of your students.

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E D U C A T I O N

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LESSON
1

FOCUS: Review tenths
MATERIALS: Tiles

1. Solve the problems. Use tiles to show your work.

a. $0.4 + 0.4 + 0.4 + 0.4 = \underline{\hspace{2cm}}$

m. $0.7 + 0.7 = \underline{\hspace{2cm}}$

b. $4 \times 0.4 = \underline{\hspace{2cm}}$

n. $3 \times 0.6 = \underline{\hspace{2cm}}$

c. $0.8 \div 0.2 = \underline{\hspace{2cm}}$

o. $1.8 \div 0.6 = \underline{\hspace{2cm}}$

d. $0.4 + 0.4 + 0.4 + 0.4 + 0.4 = \underline{\hspace{2cm}}$

p. $\frac{4}{10} + \frac{4}{10} + \frac{4}{10} + \frac{4}{10} = \underline{\hspace{2cm}}$

e. $5 \times 0.6 = \underline{\hspace{2cm}}$

q. $5 \times \frac{2}{10} = \underline{\hspace{2cm}}$

f. $1 \div 0.1 = \underline{\hspace{2cm}}$

r. $\frac{8}{10} \div \frac{2}{10} = \underline{\hspace{2cm}}$

g. $1.5 + 1.5 = \underline{\hspace{2cm}}$

s. $\frac{4}{10} + \frac{5}{10} = \underline{\hspace{2cm}}$

h. $2 \times 0.5 = \underline{\hspace{2cm}}$

t. $4 \times \frac{5}{10} = \underline{\hspace{2cm}}$

i. $3 \div 0.5 = \underline{\hspace{2cm}}$

u. $6 \div \frac{5}{10} = \underline{\hspace{2cm}}$

j. $0.3 + 0.3 + 0.3 + 0.3 + 0.3 = \underline{\hspace{2cm}}$

v. $\frac{8}{10} + \frac{8}{10} = \underline{\hspace{2cm}}$

k. $5 \times 0.3 = \underline{\hspace{2cm}}$

w. $3 \times \frac{6}{10} = \underline{\hspace{2cm}}$

l. $1.2 \div 0.3 = \underline{\hspace{2cm}}$

x. $2\frac{1}{10} \div \frac{7}{10} = \underline{\hspace{2cm}}$

2. Several of the equations in problem 1 are related in some way. They may use equivalent common and decimal fractions, or they may be members of the same fact family. Show an example of two or more related equations, and explain the relationship.

3. Use tiles to help write your own problem with tenths, using the operation of your choice. Then write as many related equations for the problem as you can.

LESSON
2

FOCUS: Review common and decimal fractions, including operations
MATERIALS: Coloured textas, ruler

1. Solve the problems.

a. $\frac{5}{5} + \frac{7}{7} = \underline{\hspace{2cm}}$

b. $\frac{6}{6} + \frac{8}{8} = \underline{\hspace{2cm}}$

c. $2 \times (\frac{4}{4} + \frac{8}{8}) = \underline{\hspace{2cm}}$

d. $8 + (\frac{1}{2} + \frac{2}{4}) = \underline{\hspace{2cm}}$

e. $5 \times (\frac{8}{16} + \frac{4}{8}) = \underline{\hspace{2cm}}$

f. $\frac{1}{2} \times (4 \times \frac{5}{10}) = \underline{\hspace{2cm}}$

g. $1 \div \frac{1}{4} = \underline{\hspace{2cm}}$

h. $\frac{4}{4} \div \frac{1}{4} = \underline{\hspace{2cm}}$

i. $(6 \times \frac{4}{4}) \div \frac{1}{2} = \underline{\hspace{2cm}}$

j. $\frac{10}{10} \div 0.25 = \underline{\hspace{2cm}}$

k. $2 \div \frac{1}{4} = \underline{\hspace{2cm}}$

l. $4 \div \frac{1}{4} = \underline{\hspace{2cm}}$

m. $6 \div 0.1 = \underline{\hspace{2cm}}$

n. $4 \div 0.2 = \underline{\hspace{2cm}}$

o. $2 \div 0.4 = \underline{\hspace{2cm}}$

p. $\frac{1}{2} + \frac{50}{100} = \underline{\hspace{2cm}}$

q. $\frac{2}{5} + 0.4 = \underline{\hspace{2cm}}$

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

2. Select one addition, multiplication, and division example from problem 1. Explain or draw a picture to show how to find the answer without using the rules for operations with fractions.

3. Write any rules that you know for each of these operations on common and decimal fractions. You may use pictures or diagrams to help explain the rules.

a. Addition

b. Multiplication

c. Division

LESSON
3

FOCUS: Review operations with fractions and mixed numbers

MATERIALS: None

1. Solve the problems.

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

e. $5 \div \frac{2}{4} = \underline{\hspace{2cm}}$

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

b. $5 \div \frac{1}{2} = \underline{\hspace{2cm}}$

f. $8 \div \frac{2}{4} = \underline{\hspace{2cm}}$

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

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

g. $5 \div \frac{3}{6} = \underline{\hspace{2cm}}$

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

d. $3 \div \frac{2}{4} = \underline{\hspace{2cm}}$

h. $3 \div \frac{1}{4} = \underline{\hspace{2cm}}$

l. $1\frac{1}{8} \div \frac{2}{16} = \underline{\hspace{2cm}}$

2. Use mental maths to solve the problems.

a. $7\frac{1}{2} \div \frac{1}{2} = \underline{\hspace{2cm}}$

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

k. $7 \times 1\frac{1}{2} = \underline{\hspace{2cm}}$

b. $7\frac{1}{2} \div \frac{4}{8} = \underline{\hspace{2cm}}$

g. $1\frac{2}{4} + 3\frac{1}{2} = \underline{\hspace{2cm}}$

l. $4\frac{1}{2} \div 1\frac{1}{2} = \underline{\hspace{2cm}}$

c. $5\frac{1}{2} \div \frac{5}{10} = \underline{\hspace{2cm}}$

h. $4 \times 2\frac{2}{4} = \underline{\hspace{2cm}}$

m. $9 - \frac{1}{2} = \underline{\hspace{2cm}}$

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

i. $10 \div 2\frac{2}{4} = \underline{\hspace{2cm}}$

n. $9 + \frac{1}{2} = \underline{\hspace{2cm}}$

e. $4 \times 1\frac{1}{2} = \underline{\hspace{2cm}}$

j. $2 \times (2\frac{1}{2} + 2\frac{2}{4}) = \underline{\hspace{2cm}}$

o. $9\frac{1}{2} + 9\frac{1}{2} = \underline{\hspace{2cm}}$

3. Pick an equation from problem 2, and explain the process you used to find the answer mentally.

4. Find the missing number in each equation.

a. $(4\frac{1}{2} + 4\frac{3}{6} + 4\frac{5}{10} + 4\frac{4}{8}) \div m = 2$ $m = \underline{\hspace{2cm}}$

b. $(4 \times 4\frac{6}{12}) \div z = 2$ $z = \underline{\hspace{2cm}}$

c. $(5 \times \frac{1}{2}) + (5 \times \frac{3}{6}) \div y = 10$ $y = \underline{\hspace{2cm}}$