

Algebra Made Easy is a maths program designed to help you develop your problem-solving skills with algebra problems. Many of the lessons will ask you to use objects or draw pictures to solve the problems. We think that this will help you better understand how to work with algebra. Each time you solve a problem in this book, try to think of another problem that you could solve the same way. As you work in *Algebra Made Easy*, you will find that problem solving can be enjoyable.

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INTRODUCTION

'Algebra for all' is being heard across the country and yet many students enter secondary school without the necessary basic prerequisite skills to complete Algebra 1 successfully. One solution many have suggested is to develop these algebra readiness skills in years 4-9. This series is designed to accomplish that goal. The authors believe that algebra readiness should begin in the early years and then develop over a number of years. Likewise, we believe that the learning of new skills and concepts should begin at the concrete level, move to the pictorial or representational level, and finally to the verbalisation level. We have been careful to maintain the mathematical integrity of the skills and concepts covered while trying to create a series that will be interesting to and challenging for your students.

ORGANISATION

This book is made up of ten lessons. Six of the lessons are instructional and three are mixed review. A review lesson follows Lesson 2 and provides mixed practice of the skills in Lessons 1 and 2. A review lesson follows Lesson 4 and provides mixed practice for Lessons 1-4. A review lesson follows Lesson 6 and provides mixed practice for Lessons 1-6. This method ensures that, by the end of the book, students are using all the skills introduced in each lesson. The last lesson is an extension lesson, which incorporates many of the concepts developed in the book and provides additional opportunities for students to work more challenging problems.

INSTRUCTIONAL LESSON DESIGN

Each of the six instructional lessons focuses on a key concept in algebra. Each lesson has three major parts and can easily be covered in three or four class periods. Some students may move more quickly through the lessons, but be sure to provide enough time so that concept development can occur.

Part A of each lesson uses manipulatives to introduce the skill or skills. The manipulatives are items that are commonly found in classrooms. Take time beforehand to be sure that these manipulatives are available.

Part B of each lesson helps the student make the transition from the concrete, manipulative level to a pictorial, representational level. Students are asked for a pictorial application of the previous manipulative activity, which helps them internalise the process.

Part C of the lesson is the verbalisation, application level. Here students work on problems and may use manipulatives or pictorials if necessary.

HOW SHOULD ALGEBRA MADE EASY BE USED?

There are many ways to use this book, all of which should be considered supplemental to your existing program.

1. You may choose to use the lessons in place of similar lessons in your maths program.
2. You may choose to present one lesson each month as a change of pace in your approach.
3. You may choose to select a six-week period to have students concentrate on critical prealgebra skills.

What *is* important is that you integrate this book into your mathematics program in a way in which you are comfortable and from which your students will benefit.

LESSON 1

Adding and Subtracting Positive Integers

PART A

MATERIALS (per player):

- 1 die
- 6 cubes of one colour (for example, red)
- 6 cubes of one colour (for example, blue)
- 1 blank sheet of paper (record sheet)

Use the game board on this page to play. Each of the two players rolls his or her die. The player with the larger number plays first.

- STEP 1** The first player rolls the die to determine his or her first number on the game board. Starting at the zero on the game board, he or she places the same number of cubes as the number on the die. Use only one colour of cube. Record the number on the record sheet.
- STEP 2** On his or her own game board, the second player then does what the first player did in Step 1.
- STEP 3** The first player rolls his or her die again. Using a different-colour cube, he or she adds the second number of cubes to the cubes already on the game board. Record the number on the record sheet.
- STEP 4** The second player then does what the first player did in Step 3.
- STEP 5** Each player adds his or her two numbers and writes the sum on the record sheet. The winner of the round is the player with the larger number. In the case of a tie, the round is replayed. The winner is the player who has won more rounds after five rounds of play.

	12
	11
	10
	9
	8
	7
	6
	5
	4
	3
	2
	1
	0

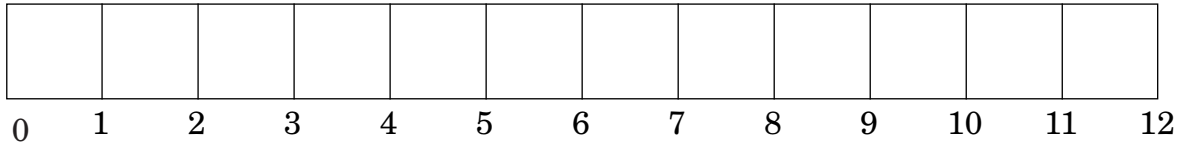
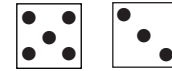
PART B

MATERIALS:

- 3 crayons (different colours)

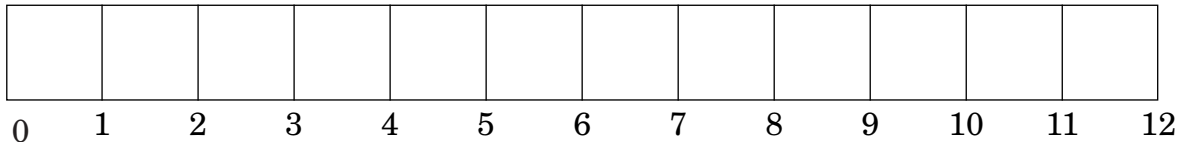
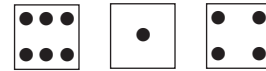
One-Step Problems

1. Look at the dice. Estimate the sum. Using two different-colour crayons, colour in the correct squares on the number line. Use the information on the number line to write a number sentence.



Estimate _____ + _____ = _____

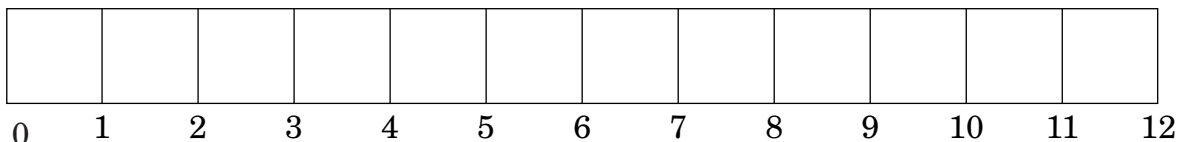
2. Look at the dice. Estimate the sum. Using three different-colour crayons, colour in the correct squares on the number line. Use the information on the number line to write a number sentence.



Estimate _____ + _____ + _____ = _____

Two-Step Problem

3. Look at the dice.



STEP 1

Use the first two dice to create an addition problem.

Estimate the sum. _____ Using two different-colour crayons, colour in the correct squares on the number line.

Use the information on the number line to complete the first part of the number sentence below.

STEP 2

Use the third die as the number to subtract from your sum.

Estimate the difference. _____ Then subtract the number by crossing out the squares on the number line.

Use the information on the number line to complete the number sentence below.

$$\underline{\quad} + \underline{\quad} = \underline{\quad} - \underline{\quad} = \underline{\quad}$$

LESSON 1 Adding and Subtracting Positive Integers

Pages 1–4

PART A, page 1

At this stage in number-sense development, students need to estimate their results. They need to look at these problems and equations as a whole and understand that estimation is a reasonable guess. This is a skill that will enable them to think through to attain reasonable answers and develop more advanced skills.

If cubes are not readily available, make copies of the number line on different-colour paper, and cut out squares of the different colours. These may be used instead of the cubes as manipulatives.

EXTENSION

1. Players may also estimate the sum or the difference after rolling the die for the second time and before placing the cubes.
2. Have students work with subtraction integers by rolling two dice to create a subtraction problem ($6 - 3 = \quad$). Instruct students to lay cubes on the number line to represent the higher number. Next, have them estimate the difference between the higher and lower numbers. Then have them remove from the number line the number of cubes represented by the lower number to find the correct answer.
3. Provide students with an extended number line. Players may use 3 dice and an additional 6 cubes of a different colour to use 3 addends rather than 2.
4. Provide students with an extended number line. Have students use different-colour cubes to practice adding and subtracting three, four, five, and six numbers.

PART B, page 2

1. $5 + 3 = 8$
2. $6 + 1 + 4 = 11$
3. $4 + 5 = 9 - 3 = 6$

PART B, page 3

1. $1 + 4 = 5$
2. $4 + 2 = 6$
3. $2 + 6 - 2 = 6$
4. $3 + 4 - 3 = 4$

PART C, page 4

1. b
2. d
3. c
4. a
5. Sample answer:
 $2 + 1 = 3$

