

INTRODUCTION

What is the **FOCUS** series?

FOCUS is a mathematics-strategy practice series. Each student book in the series provides brief instruction and concentrated practice for students in one targeted Mathematics Strategy. **FOCUS** also allows students the opportunity for self-assessment of their performance. It allows teachers the opportunity to identify and assess a student's level of mastery.

Six Mathematics Strategies featured in the **FOCUS** series:

- Building Number Sense
- Using Estimation
- Using Algebra
- Using Geometry
- Determining Probability and Averages
- Interpreting Graphs and Charts

The **FOCUS** series spans eight year levels, from year one to year eight. The introductory passages in each lesson are written at or below year level, allowing students to focus on the mathematics without struggling with the reading.

Book	Reading Level
Book A	at or below year one readability
Book B	at or below year two readability
Book C	at or below year three readability
Book D	at or below year four readability
Book E	at or below year five readability
Book F	at or below year six readability
Book G	at or below year seven readability
Book H	at or below year eight readability

What is Determining Probability and Averages, the Mathematics Strategy featured in this **FOCUS** book?

Determining probability involves finding the likelihood that an event will occur. Probability is determined by comparing a specific outcome with all of the possible outcomes in a given situation. In the early years, students study probability in terms of *more likely*, *less likely* and *equally likely* outcomes. As they progress, students learn to express probability in fraction form. The numerator represents a specific outcome, and the denominator represents the total number of possible outcomes. Students in the upper year levels also learn to express probability in percentage and decimal form.

Finding the average of a group of numbers provides information about how each number relates to the group as a whole. Students in years two to eight learn how to calculate averages. The addends that they work with increase in size and number as students progress through the year levels. In years seven and eight, students are introduced to several measures of central tendency. They learn to identify and calculate the mean, median, mode and range of a data set.

Students in year one learn important readiness concepts. They sort objects into groups. They practise sorting items by size, shape and colour. Students also combine sets into one group and then make equal groups.

In the middle years students learn to calculate the total number of possible combinations in a given situation. The number of possible combinations is determined by calculating the product of the numbers of items in the given categories.

What is in each student book?

There are 48 student books in the *FOCUS* series. There is one student book for each of the six Mathematics Strategies, at each of the eight mathematics levels. Each student book contains:

- *To the Student*

This introduces the program and should be read and discussed with students to make sure they understand what they are to do in the book.

- *Table of Contents*

- *Learn About (Modelled Practice)*

These two pages provide basic instruction and modelling in the understanding and application of the Mathematics Strategy. The Learn About should be read and discussed with students to make sure they understand the Mathematics Strategy. Additional tips for helping students understand and use the Mathematics Strategy are included in the Mathematics Strategy Tips for the Teacher on pages 12–13 of this teacher guide.

- *Lesson Preview (Guided Practice)*

These two pages include a sample problem and two selected-response questions with explanations of why each of the eight answer choices is correct or not correct. The Lesson Preview should be read, worked through and discussed with students to make sure they understand how to answer strategy-based questions.

- *20 Lessons (Independent Practice)*

Each two-page lesson contains one passage, four strategy-based selected-response questions and one strategy-based constructed-response writing question.

Selected-response questions: In each lesson, students apply the Mathematics Strategy and then choose the correct answers for four selected-response (multiple-choice) strategy-based questions. You should model how to answer these kinds of questions using information on the Lesson Preview pages.

Constructed-response writing questions:

In each lesson, students apply the Mathematics Strategy to solve a strategy-based question. You should model how to answer these kinds of questions by using one of the sample answers provided in the Answer Key.

- *Tracking Chart*

Students use this chart for noting their completion of and performance in each lesson.

- *Self-Assessments*

These five forms allow students the opportunity for self-assessment of their performance.

- *Answer Form*

Students may use this form to record their answers to the eighty selected-response questions and to indicate that they have answered each of the twenty constructed-response writing questions.

What is in each teacher guide?

There are 48 teacher guides in the *FOCUS* series, one for each student book. Each teacher guide contains:

- suggested instructions for using the *FOCUS* series effectively in the classroom
- Mathematics Strategy Tips for the Teacher, a facsimile of the Learn About on pages 2–3 of the student book, with tips for additional discussion related to understanding and using the Mathematics Strategy
- four reproducibles: three Teacher Assessments to be used for individual student assessment in the Mathematics Strategy and one Class or Group Performance Graph to be used for class or group assessment in the Mathematics Strategy
- summary of research that supports the *FOCUS* series
- a completed Answer Form for the eighty selected-response questions in the student book
- an Answer Key for the eighty selected-response questions, plus sample answers for the twenty constructed-response writing questions in the student book

How should I use the Mathematics Strategy Tips for the Teacher?

These pages contain a facsimile of the Learn About on pages 2–3 of the student book, along with extended information about the Mathematics Strategy, which you can use as a basis for in-depth discussion to make sure students understand the strategy and how to use it.

Where do students record their answers?

Students should fill in their answers to the selected-response questions on the Answer Form on page 53 of the student book. If students use the Answer Form, they may detach it from the book. Alternatively, students may fill in the correct answers directly on the student book page.

Students should write their answers to the constructed-response questions directly on the lines provided in the student book. Students who use the Answer Form for the selected-response questions should fill in the circle on the Answer Form to show that they have answered the constructed-response question, which is the fifth question in each lesson.

How should I use the *FOCUS* series in the classroom?

The *FOCUS* series can be used effectively in the classroom in several ways. Here is a suggestion for using the program in **whole class, large group, small group, paired** and **individual** formats.

To the Student

(inside front cover of the student book)

Read and discuss this with the whole class or large group to make sure students understand what they are to do in the book.

Learn About

(pages 2–3 of the student book)

Read the two pages of instruction in the Mathematics Strategy to the whole class or large group. Model using the Mathematics Strategy. Use information from the Mathematics Strategy Tips for the Teacher on pages 12–13 of this teacher guide to prompt additional in-depth discussion of the Mathematics Strategy, as appropriate. Make sure all students understand the features of the Mathematics Strategy and how to apply the Mathematics Strategy before they go on. The Learn About requires approximately 45 minutes.

Lesson Preview

(pages 4–5 of the student book)

Read the boxed directions to the whole class or large group. Emphasise what students should watch for as they read the problem. Have students read the problem individually. Guide the whole class or large group in answering the two selected-response questions. Then discuss why each answer choice is correct or not correct. Make sure all students understand how to answer the Mathematics Strategy questions before they go on. The Lesson Preview requires approximately 45 minutes.

Lessons

(pages 6–45 of the student book)

For each lesson, have students read the directions and the passage individually, in pairs or in small groups. Have students answer the selected-response questions and the constructed-response question individually, in pairs or in small groups.

Have students use the Tracking Chart on page 47 of the student book to note the date that they have finished each lesson. When the questions in all five lessons in a group have been corrected, have students note the number of correct responses for each lesson and then the number of correct responses for the whole group of lessons.

Each lesson, plus tracking, requires approximately 45 minutes. Allow students 30 minutes to read the passage and answer the questions, and allow 15 minutes to discuss the responses. Discuss the answers to the questions with the whole class or large group, or with pairs, small groups or individuals. (See **What is the correction procedure?** on page 4 of this teacher guide.)

Self-Assessment: When students have finished each group of five lessons, have them complete the appropriate Self-Assessment. When students have finished all twenty lessons, have them complete Self-Assessment 5. Each Self-Assessment requires approximately 20 minutes.

Discussion: When students have finished each group of five lessons, discuss their performance individually or in small groups. When students have finished all twenty lessons, discuss their performance individually or in small groups. Each discussion requires approximately 25 minutes.

MATHEMATICS STRATEGY TIPS FOR THE TEACHER

Using probability can help you predict whether something will happen.

At this level, students explore the probability of an event's occurring as more likely than, less likely than or equally likely as another event. For example, if there are more green blocks in a box than any other colour, the likelihood of picking a green block without looking into the box is *more likely* than that of picking any other colour block.

Organised lists, such as the charts on the Learn About page, can be used to determine the probability of events. One column lists the types of objects in a data set. The other column lists the number of each type of object. If one of the objects in the data set is chosen randomly, the greatest number in the chart indicates the most likely event. Conversely, the least number in the chart indicates the least likely event. Equal numbers in the chart indicate events that are equally likely to occur when items are selected randomly.

Spinners can be used to show probability in a variety of ways. The spinner on the Learn About page demonstrates probability by the sizes of the spinner sections. A spinner of this type is most likely to stop on the largest section and least likely to stop on the smallest section. Each time the spinner is spun, the spinner is equally likely to stop on sections of equal size. Some spinners have sections that are all of equal size, but the number of spaces displaying each label may differ. Draw a circular spinner that has 8 equal sections. Label 3 of the sections A, 2 of the sections B, 2 of the sections C and 1 section D. Discuss with students the likelihood of the spinner's stopping on each letter.

Learn About

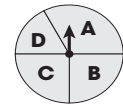
Determining Probability and Averages: Probability

Probability is the chance that something will happen. One event can be more likely than, less likely than, or equally likely to happen as another event.

The chart shows the number of crayons in a box. The probability of picking a red crayon is greatest. There are more red crayons than any other colour. The probability of picking a yellow crayon is least. There are fewer yellow crayons than any other colour.

This spinner has four sections. The spinner is most likely to stop on section A because it is the largest section. The spinner is least likely to stop on section D because it is the smallest section. The spinner is equally likely to stop on sections B and C because they are the same size.

Crayons	
Colour	Number
Red	8
Blue	5
Yellow	2
Green	7



Roger has a set of toy cars. Each car is about the same size and shape. Some of his toy cars have plastic wheels. Some have rubber wheels. Some have metal wheels. Roger picks a car from his toy box. What type of wheels is the car most likely to have?

Toy Cars	
Wheels	Number
Plastic	3
Rubber	7
Metal	4

There are more cars with rubber wheels. Roger is most likely to pick a car with **rubber wheels**.



Probability is the chance that something will happen. One event can be more likely than, less likely than, or equally likely to happen as another event.

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Explore the probability of events occurring in the classroom. Ask students to list the eye colours of students in the class, and write the number of students with eyes of each colour. Then ask a question such as this: "If we randomly pick a student from the class, are we more likely to pick a student with blue or brown eyes?" You may need to explain the concept of *random* by providing an example such as picking names from a bag. Encourage students to create their own questions. If students ask questions for which the outcomes are impossible, you might want to explain why such outcomes or events are impossible.