Adult Basic Education
Level II Mathematics

Mathematics 2013
Decimals

Curriculum Guide

Level II Mathematics Courses
Mathematics 2011: Whole Numbers
Mathematics 2012: Fractions
Mathematics 2013: Decimals
Mathematics 2014: Percents
Mathematics 2015: Interest
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Mathematics 2018: Statistics and Probability
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Mathematics 2020: Algebra Readiness II

Newfoundland
Labrador

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Introduction to Mathematics 2013: Decimals

This course is the third in a series of ten ABE Level II Mathematics courses. This course is recommended for students who have transitioned from ABE Level I into ABE Level II. Such students will likely need this course in order to develop the skills and confidence to continue in Level II and eventually progress to Level III. Likewise, students who left school without a junior high school education will benefit from this course as well. This course covers the basic mathematical operations involving decimal numbers including adding, subtracting, multiplying and dividing decimals. Students will also solve word problems involving decimal numbers.

Students may/may not have to complete all ABE Level II Mathematics courses. Students are only required to complete sufficient Level II Mathematics courses to ensure success in one of the Level III graduation profiles. For example, a Level II student intending to complete the Degree-Technical Profile (Academic) in Level III may need to complete more Level II Mathematics courses than a student intending to complete the General College Profile (General) in Level III.

Mathematics 2013: Decimals is divided into two units. The outcomes for this course are given below. By completing the **Required Work** in the Study Guide, students will fulfill the outcomes for this course.

The first unit, *Addition and Subtraction,* will cover the following course outcomes:

1.01	Convert between fractions and decimals.
1.02	Convert between decimals and fractions.
1.03	Add decimals.
1.04	Subtract decimals.
1.05	Solve word problems involving the addition and subtraction of decimals.

The second unit, *Multiplication and Division*, will cover the following course outcomes:

2.01	Multiply decimals.
2.02	Multiply decimals by multiples of 10.
2.03	Divide decimals by whole numbers.
2.04	Divide decimals by decimals.
2.05	Solve problems involving the multiplication and division of decimals.

To the Instructor

Students are required to complete two assignments and one final exam in this course. Instructors have flexibility to substitute another assignment and/or tests, or to adjust the evaluation scheme to meet the needs of individual students.

Curriculum Guide

Each new ABE Level II Mathematics course has a Curriculum Guide for the instructor and a Study Guide for the student. The Curriculum Guide includes the specific curriculum outcomes for the course. Suggestions for teaching, learning and assessment are provided to support student achievement of the outcomes. Some suggestions for teaching, learning and assessment will be repeated in the curriculum guides for the Mathematics courses when appropriate. Each Level II Mathematics course is divided into two units except **Mathematics 2019: Algebra Readiness I** and **Mathematics 2020: Algebra Readiness II**. The two pre-algebra courses are required for any Level II student, who has not successfully completed Grade 9 Mathematics, intending to do the academic mathematics stream in Level III. These two courses are more challenging and have more content than the other Level II Mathematics courses. Each unit is presented in the Curriculum Guide as a **two-page layout of four columns** as illustrated in the figure below.

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Curriculum Guide Organization
The Two-Page, Four-Column Spread

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Unit Number – Unit Title	
Outcomes	**Notes for Teaching and Learning**
Specific curriculum outcomes for the unit.	Suggested activities, elaboration of outcomes, and background information.

Unit Number – Unit Title	
Suggestions for Assessment	**Resources**
Suggestions for assessing students' achievement of outcomes.	Recommended resources that address outcomes.

Study Guide

The Study Guide provides the student with the name of the text required for the course and specifies the lessons and pages that the student will need to refer to in order to complete the **Required Work** for the course. It guides the student through the course by assigning relevant reading and exercises. Sometimes the Study Guide provides important points for students to think about, to remember or to note. The Study Guide is designed to give students some degree of independence in their work. Instructors should note, however, that there is material in the Curriculum Guide in the *Notes for Teaching and Learning* and *Suggestions for Assessment* columns that is not included in the Study Guide, and instructors will need to review this information and decide how to include it.

Resources

Recommended student resources for this course:

- *Prism Math Blue Student Workbook (Canadian Edition)*. McGraw-Hill Ryerson. 2005. ISBN 13: 978-0-07-096033-6 (10:0-07-096033-X). http://www.mcgrawhill.ca

Recommended instructor resources:

- *Prism Math Blue Teacher's Edition (Canadian Edition)*. McGraw-Hill Ryerson. 2005. ISBN 007096034-8 (9-780070-960343). http://www.mcgrawhill.ca

The *Prism Math Blue Student Workbook* is designed to help struggling students gain a solid understanding of and confidence in numeracy fundamentals. This is a non-grade specific text that is focused on easy-to-understand instructions as well as review materials and assessment opportunities. Feedback from Newfoundland and Labrador ABE instructors in 2010 indicated a desire for one Level II Mathematics student text, and this resource meets this purpose. This resource is also used in adult learning settings in other Atlantic jurisdictions.

To the Instructor

The *Prism Math Blue Teacher's Edition* mirrors the student workbook, but contains the following helpful additions:

- All answers are conveniently provided for each assigned exercise.
- Error Analysis at the bottom of each lesson gives suggestions for responding to and assessing student performance.
- Blackline Masters (BLM's) of chapter tests are contained in this resource. These masters can be photocopied and used by instructors for chapter tests/exams/etc.

Recommended Evaluation

Assigned Exercises	20%
Assignments	30%
Final Exam (entire course)	<u>50%</u>
	100%

The overall pass mark for the course is 50%.

Note: The evaluation scheme recommended above is presented as a suggestion. Institutions may choose an alternate evaluation scheme in order to meet the individual needs of adult learners. The Department of Education has no requirement that a final exam must be given in this course. Instructors/institutions can decide if a final exam is necessary based on their own policies and procedures.

Unit 1: Addition and Subtraction —Suggestions for Teaching, Learning and Assessment

Outcomes	Notes for Teaching and Learning
1.01 Convert between fractions and decimals. 1.02 Convert between decimals and fractions. 1.03 Add decimals. 1.04 Subtract decimals. 1.05 Solve word problems involving the addition and subtraction of decimals.	• There are two basic methods for writing a fraction as a decimal: 1) change the fraction to an equivalent fraction with a denominator of 10, 100, or 1000, and 2) divide the numerator by the denominator. • Ensure that students understand that it is possible to describe part of a whole in three ways: 1) as a fraction, 2) as a decimal, and 3) as a percent (will be covered in **Mathematics 2014: Percents**). • Students can use hundredths grids (10 X 10 grids) to model relationships between fractions and decimals. • Students can use number lines to show the relationships among fractions, decimals and percents. • Students should keep the decimal points aligned when adding and subtracting decimals. • Ensure students understand how to use zero as place holders when adding and subtracting decimals.

Unit 1: Addition and Subtraction —Suggestions for Teaching, Learning and Assessment

Suggestions for Assessment	Recommended resources that address outcomes.
- Instructors may ask students to complete the *Chapter 3 Pre-test* to determine their prior knowledge of mathematical operations with decimals. - If a student scores an acceptable grade on the pre-test, it is unnecessary for the student to complete the course as competency will be established. The student should show all calculations on the pre-test, and complete it without using a calculator. It is recommended that this grade be 80% or above. - Instructors can use the grade on the pre-test as the final grade for the course. This grade can be entered on the ABE database as part of the official ABE transcript. - Instructors should follow the suggestions given in **Lesson Follow-up and Error Analysis** section found in the *Teacher's Edition*. This section is written in blue and is at the bottom of the page containing each lesson. - Answers for all exercises and word problems are contained in the *Teacher's Edition*. Instructors can quickly assess and provide feedback on student performance. - A chapter test Blackline Master (BLM) corresponding to this unit is found in the assessment section of the *Teacher's Edition* (near the end of the book).This BLM is suitable to be administered to students as part of the official evaluation for the course. Answers are also provided in the *Teacher's Edition*. - Instructors can use their professional judgement to design their own assessment tools (additional exercises and word problems, assignments, tests, exams, etc) to meet the individual needs of students.	*Prism Math (Blue)*, page 66. Answers on the same pages of the *Prism Math (Blue) Teacher's Edition*. *Prism Math (Blue) Teacher's Edition*, pages 265-277.

Unit 2: Multiplication and Division —Suggestions for Teaching, Learning and Assessment

Outcomes	Notes for Teaching and Learning
2.01 Multiply decimals. 2.02 Multiply decimals by multiples of 10. 2.03 Divide decimals by whole numbers. 2.04 Divide decimals by decimals. 2.05 Solve problems involving the multiplication and division of decimals.	• Students should understand that multiplying decimals is done in the same manner as multiplying whole numbers. • Show students that it is necessary to line up the numbers on the right when multiplying decimals—you do not line up the decimal points. • Starting on the right, multiply each digit in the top number by each digit in the bottom number. Carry numbers as required. • Add the products and place the decimal point in the answer by starting at the right and moving a number of places equal to the sum of decimal places in both numbers multiplied. • Ensure students understand short cuts for multiplying by powers of 10. Explain to students that it is a good idea to insert zeros when there are not enough places to move the decimal point. • Ensure students understand that when dividing decimals by whole numbers, the decimal point in the quotient should be directly above the decimal point in the dividend. • Ensure students understand the correct way to divide decimals by decimals. Students should understand that it is necessary to convert the number you are dividing by to a whole number first. This is done by shifting the decimal point of both numbers to the right.

Unit 2: Multiplication and Division —Suggestions for Teaching, Learning and Assessment	

Suggestions for Assessment	**Recommended resources that address outcomes.**
• Instructors may ask students to complete the *Chapter 3 Pre-test* to determine their prior knowledge of mathematical operations with decimals. • If a student scores an acceptable grade on the pre-test, it is unnecessary for the student to complete the course as competency will be established. The student should show all calculations on the pre-test, and complete it without using a calculator. It is recommended that this grade be 80% or above. • Instructors can use the grade on the pre-test as the final grade for the course. This grade can be entered on the ABE database as part of the official ABE transcript. • Instructors should follow the suggestions given in **Lesson Follow-up and Error Analysis** section found in the *Teacher's Edition*. This section is written in blue and is at the bottom of the page containing each lesson. • Answers for all exercises and word problems are contained in the *Teacher's Edition*. Instructors can quickly assess and provide feedback on student performance. • A chapter test Blackline Master (BLM) corresponding to this unit is found in the assessment section of the *Teacher's Edition* (near the end of the book).This BLM is suitable to be administered to students as part of the official evaluation for the course. Answers are also provided in the *Teacher's Edition*. • Instructors can use their professional judgement to design their own assessment tools (additional exercises and word problems, assignments, tests, exams, etc) to meet the individual needs of students.	• *Prism Math (Blue)*, page 66. Answers on the same pages of the *Prism Math (Blue) Teacher's Edition*. • *Prism Math (Blue) Teacher's Edition*, pages 265-277.