Math 12 Apprenticeship Course Outline

Material Covered:

The Mathematics Apprenticeship 12 course is divided into nine units and an inquiry:

Measuring
- Using measuring tools
- Metric/Imperial conversions

Calculating
- Nets and surface area
- Volume
- Trigonometry & right triangles
- Sine Law/Cosine Law

Drawing
- Isometric drawing
- Orthographic drawing

Inquiry
- Business Finances

Textbook:

The course uses three textbooks.

- *Mathematics for Apprenticeship and Workplace 10* (ISBN 978-0-17-650271-3, Nelson)
- *Mathematics for Apprenticeship and Workplace 11* (ISBN 978-0-17-650416-8, Nelson)
- *Mathematics for Apprenticeship and Workplace 12* (ISBN 978-0-17-651963-6, Nelson)

Notebook:

Your notebook should be neatly organized, as this will help you study for tests. Label the unit and topic headings clearly at the top of the page. Answer questions fully, so that the information makes sense and can be used later for studying. Show which textbook and which page number the information comes from so you can look it up again easily.

Grading:

This course works on a mastery system. You must pass the mastery tests in each unit to the 80% level before you can go on. In addition, there are cumulative tests from time to time. These are tests you can only take once, so studying before them is essential to do well. Your final class mark for the course is based 60% on the mastery unit tests and 40% on the cumulative tests.

Goal:

The goal of this unit is to increase your abilities with using measuring tools

Objectives:

By the end of this unit you should be able to:

- Understand the difference between precision and uncertainty.
- Understand and apply the idea of significant digits.
- Understand the relationship between precision and accuracy.
- Understand and apply the concepts of uncertainty and tolerance in measurements.

What to Do in this Unit:

- This Unit uses **Chapter 2** in the textbook ***Mathematics for Apprenticeship and Workplace 12*****.**
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always Show FSS (Formula used, Substitution of knowns, Solution for unknown). You will be required to Show FSS on tests for full marks.

Chapter 2 – Mathematics for Apprenticeship and Workplace 12		
	Getting Started	All questions
	2.1	All questions
	2.2	All questions
	2.3	Optional. Not testable.
	Mid-Chapter Review	All questions
	2.4	All questions
	2.5	All questions
	Chapter Review	All questions

- When you are ready ask your teacher for the Unit 1 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to reinforce your abilities with converting between metric and Imperial measuring systems.

Objectives:

By the end of this unit you should be able to:

- Use Imperial and metric units for length.
- Estimate and measure length.
- Determine the midpoint of a line.
- Express Imperial units as metric.
- Express metric units as Imperial.

What to Do in this Unit:

- This Unit uses **Chapter 2** in the textbook ***Mathematics for Apprenticeship and Workplace 10*.**
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always Show FSS (Formula used, Substitution of knowns, Solution for unknown). You will be required to Show FSS on tests for full marks.

Chapter 2 – Mathematics for Apprenticeship and Workplace 10		
	Getting Started	All questions
	2.1	All questions
	2.2	All questions
	2.3	All questions
	Mid-Chapter Review	All questions
	2.4	All questions
	2.5	All questions
	2.6	All questions
	2.7	All questions
	2.8	Optional. Not testable.
	Chapter Review	All questions

- When you are ready ask your teacher for the Unit 2 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

- Go over your work from Units 1 and 2 in preparation for Cumulative Test #1. When you are ready to write it, ask your teacher. Remember, this test can only be taken once, so study hard and do your best.

Goal:

The goal of this unit is to reinforce your abilities with nets and surface area.

Objectives:

By the end of this unit you should be able to:

- Relate nets to surface area.
- Calculate the surface area of prisms, cylinders, pyramids, cones and spheres.
- Estimate surface area.
- Understand how dimension changes affect surface area.

What to Do in this Unit:

- This Unit uses **Chapter 3** in the textbook ***Mathematics for Apprenticeship and Workplace 11***.
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always Show FSS (Formula used, Substitution of knowns, Solution for unknown). You will be required to Show FSS on tests for full marks.

Chapter 3 – Mathematics for Apprenticeship and Workplace 11		
	Getting Started	All questions
	3.1	All questions
	3.2	All questions
	3.3	All questions
	Mid-Chapter	All questions
	3.4	All questions
	3.5	All questions
	3.6	All questions
	3.7	Optional. Not testable.
	Chapter Review	All questions

- When you are ready ask your teacher for the Unit 3 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to increase your skills calculating volume and capacity.

Objectives:

By the end of this unit you should be able to:

- Calculate the volume of prisms, cylinders, pyramids, cones, and spheres.
- Calculate the volume of composite objects.
- Determine and estimate volume.
- Understand how dimension changes affect volume.
- Determine capacity, and solve capacity problems.
- Estimate capacity.

What to Do in this Unit:

- This Unit uses **Chapter 4** in the textbook ***Mathematics for Apprenticeship and Workplace 11*****.**
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always Show FSS (Formula used, Substitution of knowns, Solution for unknown). You will be required to Show FSS on tests for full marks.

Chapter 4 – Mathematics for Apprenticeship and Workplace 11		
	Getting Started	All questions
	4.1	All questions
	4.2	All questions
	4.3	All questions
	4.4	All questions
	4.5	All questions
	Mid-Chapter Review	All questions
	4.6	All questions
	4.7	Optional. Not testable.
	4.8	All questions
	4.9	All questions
	4.10	All questions
	Chapter Review	All questions

- When you are ready ask your teacher for the Unit 4 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to increase your skills with trigonometry.

Objectives:

By the end of this unit you should be able to:

- Know and apply the Pythagorean Theorem.
- Calculate lengths using Sine, Cosine and Tangent.
- Calculate angles using Sine, Cosine and Tangent.
- Solve right triangle problems.

What to Do in this Unit:

- This Unit uses **Chapter 8** in the textbook ***Mathematics for Apprenticeship and Workplace 10*****.**
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always Show FSS (Formula used, Substitution of knowns, Solution for unknown). You will be required to Show FSS on tests for full marks.

Chapter 8 – Mathematics for Apprenticeship and Workplace 10		
	Getting Started	All questions
	8.1	All questions
	8.2	All questions
	8.3	All questions
	Mid-Chapter	All questions
	8.4	All questions
	8.5	All questions
	8.6	All questions
	8.7	All questions
	8.8	Optional. Not testable.
	Chapter Review	All questions

- When you are ready ask your teacher for the Unit 5 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to increase your skills with solving triangles using the Sine Law and Cosine Law.

Objectives:

By the end of this unit you should be able to:

- Use the Sine Law to solve for missing information in triangles.
- Use the Cosine Law to solve for missing information in triangles.
- Know when to choose the Sine Law and when to choose the Cosine Law.

What to Do in this Unit:

- This Unit uses **Chapter 9** in the textbook ***Mathematics for Apprenticeship and Workplace 12*.**
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always Show FSS (Formula used, Substitution of knowns, Solution for unknown). You will be required to Show FSS on tests for full marks.

Chapter 9 – Mathematics for Apprenticeship and Workplace 12		
	Getting Started	All questions
	9.1	All questions
	9.2	All questions
	9.3	Optional. Not testable.
	Mid-Chapter	All questions
	9.4	All questions
	9.5	All questions
	Chapter Review	All questions

- When you are ready, ask your teacher for the Unit 6 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

- Go over your work from Units 3, 4, 5 and 6 in preparation for Cumulative Test #2. When you are ready to write it, ask your teacher. Remember, this test can only be taken once, so study hard and do your best.

Goal:

The goal of this unit is to learn how to create isometric drawings of 3-D objects.

Objectives:

By the end of this unit you should be able to:

- Draw isometric diagrams of a variety of 3-D objects.

What to Do in this Unit:

- This Unit doesn't use a textbook. Ask your teacher for the Unit 7 Workbook, and complete all the work in it.

- When you are ready ask your teacher for the Unit 7 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to learn how to create orthographic drawings of 3-D objects.

Objectives:

By the end of this unit you should be able to:

- Choose how many of the six orthographic views are required to accurately portray a 3-D object.
- Use each of the line styles (visible, hidden) correctly.
- Make an accurate and complete two dimensional drawing of a 3-D object, including at least front, top, and right-side views.

What to Do in this Unit:

- This Unit doesn't use a textbook. Ask your teacher for the Unit 8 Workbook, and complete all the work in it.

- When you are ready ask your teacher for the Unit 8 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

- Go over your work from Units 7 and 8 in preparation for Cumulative Test #3. When you are ready to write it, ask your teacher. Remember, this test is one chance only, so do your best.

Goal:

The goal of this unit is to conduct an inquiry into a question about an aspect of business finances.

Objectives:

By the end of this unit you will have:

- Chosen an inquiry question on some aspect of business finances that is interesting to you.
- Conducted researched your inquiry question.
- Presented your findings to your teacher via your chosen medium.

What to Do in this Unit:

- Ask your teacher for the Unit 9 Worksheet, and complete the work there.
- Your inquiry presentation will act as the test for this unit, so be sure to do a thorough job on it.

- **Congratulations! You've finished Mathematics 12 Apprenticeship!**