Science 9 Course Outline

MATERIAL COVERED

The Science 9 course is divided into four broad themes:

- **Reproduction**
- **Atoms, Elements and Compounds**
- **Characteristics of Electricity**
- **Space Exploration**

TEXTBOOK

The course uses the textbook *BC Science PROBE 9 (ISBN 0-17-629066-4,* Nelson*)*

OTHER USEFUL RESOURCES

- *BC Science PROBE 9* website: www.science.nelson.com/bcscienceprobe9/centre.html

COURSE DESIGN

The covers the material in the same sequence as the chapters in the textbook. Cumulative tests cover more than one chapter at a time, and occur at the end of each of the four broad themes.

TRY THIS & INVESTIGATIONS

Not all classrooms are equipped with science equipment. Your teacher will tell you whether you are required to do the TRY THIS activities and INVESTIGATIONS in each chapter. **If you don't have the lab facilities, you are still required to read the content covered in each TRY THIS activity and INVESTIGATION**, as it will usually have vocabulary that will appear on tests.

EVALUATION

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 at the end of each broad theme. **These are tests you can take only once, so studying before them is essential to doing well**. Your final mark for the course is based 60% on mastery tests and 40% on cumulative tests.

Science 9 Unit 1

GOAL

The goal of this chapter is to learn about the nature of science and scientific inquiry.

OBJECTIVES

While completing this unit you will:

- Explain how the scientific method is an organized way of learning about the natural world.
- Describe how the nature of a scientific question determines the method used by scientists to investigate it.
- Understand how science and technology are two very different, but related fields that often advance together.

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 1**.

- Ask your teacher for the **Unit 1 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

GOAL

The goal of this unit is to learn about cell growth and reproduction.

OBJECTIVES

While completing this unit you will:

- Understand that the functions of cell growth are repair and reproduction
- Describe the key role played by DNA in normal cell functions and cell division
- Describe how the normal cell cycle includes the normal cell functions and cell division
- Understand how mutations in a cell's DNA can cause diseases like cancer
- Describe how some organisms reproduce asexually through cell division

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 2.**

- Ask your teacher for the **Unit 2 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

GOAL

The goal of this unit is to learn about sexual reproduction.

OBJECTIVES

While completing this unit you will:

- Know that meiosis is the process that produces sex cells
- Understand that the joining of genetic material from two parents is called sexual reproduction
- Learn that sexual reproduction is responsible for the incredible diversity amongst members of the same species
- Investigate the advantages and disadvantages of asexual and sexual reproduction
- Learn about the variety of strategies organisms use for successful sexual reproduction
- Investigate reproductive technologies

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 3.**

- Ask your teacher for the **Unit 3 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

GOAL

The goal of this unit is learn about human reproduction.

OBJECTIVES

While completing this unit you will:

- Understand that male and female humans have specialized sexual organs.
- Know that it takes nine months for a human to develop from zygote to baby
- Investigate how sex chromosomes determine the gender of a baby
- Learn how errors in meiosis can result in changes to both the gametes and the offspring
- Investigate technologies that can identify potential problems and allow humans to successfully reproduce

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 4.**

- Ask your teacher for the **Unit 4 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

- **Reread** the chapters assigned for Units 1–4 and go over your worksheets in preparation for Cumulative Test 1. To check your understanding of this section, you should complete the **Unit A Review** beginning on page 144.

- When you are ready, ask your teacher for Cumulative Test #1. **Remember, you may only write this test once**, so you have to study hard to do well on it.

GOAL

The goal of this unit is learn more about the properties and changes of matter.

OBJECTIVES

While completing this unit you will:

- See how matter can be classified as pure substances or mixtures
- Learn how pure substances can be identified
- Understand how a physical change alters a substance's state or form, but not its composition
- Understand how a chemical change alters a substance's composition, creating new substances
- Investigate the kinetic molecular theory and how it explains the nature and behaviour of matter

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 5**.

- Ask your teacher for the **Unit 5 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

GOAL

The goal of this unit is learn more about the elements and their classification in the periodic table.

OBJECTIVES

While completing this unit you will:

- Learn how ancient chemistry was practical, but short on the understanding of matter
- Investigate how the universal naming system for elements and compounds was developed
- Know how to classify elements into the three categories: metals, non-metals, and metalloids
- Learn how the periodic table makes sense of the elements by grouping together those with the same properties

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 6**.

- Ask your teacher for the **Unit 6 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

GOAL

The goal of this unit is learn more about atomic theory and how it explains the invisible.

OBJECTIVES

While completing this unit you will:

- Know that matter is made up of atoms
- Understand how the atomic theory has changed with new discoveries
- Learn how elements can be classified by using their properties
- Learn how the chemical and physical properties are determined by an atom's structure

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 7**.

- Ask your teacher for the **Unit 7 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

GOAL

The goal of this unit is learn more about ionic compounds, their names, and formulas.

OBJECTIVES

While completing this unit you will:

- Learn how elements combine in exact proportions to create compounds
- Understand how the formula for an ionic compound can be determined from its name
- Understand how the name for an ionic compound can be determined from its formula
- Learn how chemical families are groups of elements with similar chemical and physical properties

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 8**.

- Ask your teacher for the **Unit 8 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

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

- **Reread** the chapters assigned for Units 5–8 and go over your worksheets in preparation for Cumulative Test 2. To check your understanding of this section, you should complete the **Unit B Review** beginning on page 266.

- When you are ready, ask your teacher for Cumulative Test #2. **Remember, you may only write this test once**, so you have to study hard to do well on it.

GOAL

The goal of this unit is learn more about static electricity.

OBJECTIVES

While completing this unit you will:

- Learn how static charges can build up on an object
- Understand how friction, conduction, and induction charge objects
- Know how an electric force between static charges can either attract or repel the charges
- The discharge of static electricity can be dangerous or useful

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 9**.

- Ask your teacher for the **Unit 9 Worksheets**.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 9 Test. Remember, you must get 80% to pass, so studying hard is essential.

GOAL

The goal of this unit is learn more about current electricity.

OBJECTIVES

While completing this unit you will:

- Know that electric charges in a circuit flow from an energy source to a device that uses them
- Understand that current and voltage can be measured by meters
- Investigate Ohm's law and how it relates resistance, voltage, and current in a circuit
- Investigate how series and parallel circuits differ

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 10**.

- Ask your teacher for the Unit 10 Worksheets.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 10 Test. Remember, you must get 80% to pass, so studying hard is essential.

GOAL

The goal of this unit is learn more about using electricity.

OBJECTIVES

While completing this unit you will:

- Learn how electrical energy can be converted into other types of energy
- Understand how electrical power is the rate at which electrical energy is transformed into another type of energy
- Both renewable and non-renewable sources can produce electrical energy
- Learn how to determine energy consumption

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 11**.

- Ask your teacher for the Unit 11 Worksheets.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 11 Test. Remember, you must get 80% to pass, so studying hard is essential.

- **Reread** the chapters assigned for Units 9–11 and go over your worksheets in preparation for Cumulative Test 3. To check your understanding of this section, you should complete the **Unit C Review** beginning on page 360.

- When you are ready, ask your teacher for Cumulative Test #3. **Remember, you may only write this test once**, so you have to study hard to do well on it.

GOAL

The goal of this unit is learn more about our solar system.

OBJECTIVES

While completing this unit you will:

- Know how we can get clues to the Earth's motions by observing the night sky
- Investigate several phenomena of the Earth–Moon system
- Learn what evidence is the basis for theories on the formation of the solar system
- Learn about the unique characteristics of planets in our solar system

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 12**.

- Ask your teacher for the Unit 12 Worksheets.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 12 Test. Remember, you must get 80% to pass, so studying hard is essential.

GOAL

The goal of this unit is learn more about the universe and its stars.

OBJECTIVES

While completing this unit you will:

- Know how technology has helped our understanding of the universe
- Understand how nuclear fusion powers stars and is the force behind other stellar phenomena
- Learn how a star's mass determines the stages of its life cycle
- Investigate how structure and characteristics distinguish galaxies, star clusters, and nebulas

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 13**.

- Ask your teacher for the Unit 13 Worksheets.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 13 Test. Remember, you must get 80% to pass, so studying hard is essential.

- When you are ready, ask your teacher for Cumulative Test #4. **Remember, you may only write this test once**, so you have to study hard to do well on it.

GOAL

The goal of this unit is learn more about the tools used by astronomers.

OBJECTIVES

While completing this unit you will:

- Learn about the early tools used by astronomers
- Investigate the different types of telescopes used by modern astronomers
- Understand how computers are essential to modern astronomy
- Know why space probes are sent to explore planets and other objects

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 14**.

- Ask your teacher for the Unit 14 Worksheets.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.
- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**
- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 14 Test. Remember, you must get 80% to pass, so studying hard is essential.

GOAL

The goal of this unit is learn more about exploring space.

OBJECTIVES

While completing this unit you will:

- Know that the technology for travel beyond our solar system hasn't been developed yet
- Know that new technologies are under development
- Understand the ethical issues associated with space travel
- Learn what further space exploration is planned for the coming decades

WHAT TO DO IN THIS UNIT

- This unit uses the textbook BC Science Probe 9, **Chapter 15**.

- Ask your teacher for the Unit 15 Worksheets.

- In the textbook, read **all** of the Chapter, and once you are done, answer the questions on the Unit Worksheets.

- **Remember to ask your teacher if you are required to do the *TRY THIS* activities and *INVESTIGATIONS* in this Chapter.**

- If your teacher tells you to, or if you feel you need further practice, do **all** the Check Your Understanding questions through out the chapter.
- For a final review, do the Chapter Review questions at the end of the chapter.
- Check out the website! www.science.nelson.com/bcscienceprobe9/centre.html Your teacher will know the password if your school has signed up for access.

- When you are ready, ask your teacher for the Unit 15 Test. Remember, you must get 80% to pass, so studying hard is essential.

- **Reread** the chapters assigned for Units 12-15 and go over your worksheets in preparation for Cumulative Test 4. To check your understanding of this section, you should complete the **Unit D Review** beginning on page 510.

- When you are ready, ask your teacher for Cumulative Test #4. **Remember, you may only write this test once**, so you have to study hard to do well on it.