Science 10 Course Outline

Material Covered:

The course is comprised of the following four themes:

DNA
- DNA helps us investigate living things
- Passing heredity information to a new generation
- Natural and artificial selection influence change
- Manipulating genes

Energy
- Properties of energy
- Transforming energy
- Effects of energy transformation on Earth and us

Chemistry
- Chemical processes require energy change
- Changes to atoms in a chemical reaction
- Energy and chemical processes
- Atom rearrangement in chemical reactions

Universe Formation
- Making sense of the universe using only our eyes
- Technology helps us understand the universe
- Explaining the universe using the Big Bang theory

Textbook:

BC Science Connections 10 ISBN 13: 978-0-17-686093-6 (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 what page number in the textbook the information comes from so you can look it up again easily.

Projects:

Each topic has a final test but there is also the option to do a project. You may choose to showcase your knowledge by taking a test, doing a project, or a combination of both. Each section has suggested topics for you to investigate called inquiries in the textbook. Or, you can negotiate your own topic with your teacher. Be sure to get permission first if you are investigating your own topic!

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 class mark for the course is based 60% on the mastery unit tests or projects and 40% on the projects.

Theme:

The four topics in the DNA Theme examine how DNA is the foundation for the unity and diversity of living things.

Goal:

The goal of this unit is to investigate how an understanding of DNA helps us investigate living things.

Key Concepts:

While completing this unit you will investigate how:

- DNA is the reason for the variation in living things.
- Nucleotides linked in specific order is the structure of DNA.
- DNA exists in chromosomes containing thousands of genes.
- DNA's structure is vital to passing on information.
- The different genetic make-up of living things is reflected in life's diversity.

What to Do in this Unit:

- This unit uses Topic 1.1 in the *BC Science Connections 10* textbook.

- Ask your teacher for the Unit 1 Worksheet.

- Read Topic 1.1 beginning on page 8. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.

- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

Theme:

The four topics in the DNA Theme examine how DNA is the foundation for the unity and diversity of living things.

Goal:

The goal of this unit is to investigate how hereditary information is passed on to the next generation.

Key Concepts:

While completing this unit you will investigate how:

- Genes pass on inherited traits to offspring from parents.
- Punnett squares can be used to show the probability of inheriting a trait.
- In codominance, both alleles are expressed.
- In incomplete dominance, alleles aren't dominant or recessive.
- Some inherited traits are due to alleles on the sex chromosomes.

What to Do in this Unit:

- This unit uses Topic 1.2 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 2 Worksheet.
- Read Topic 1.2 beginning on page 24. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

Theme:

The four topics in the DNA Theme examine how DNA is the foundation for the unity and diversity of living things.

Goal:

The goal of this unit is to investigate how natural and artificial selection influence population changes.

Key Concepts:

While completing this unit you will investigate how:

- DNA mutations are responsible for genetic diversity.
- Natural selection favours traits that make an organism better adapted to its environment.
- New species can result from natural selection.
- Mutations can be caused by environmental factors.
- Humans can select desired characteristics in an organism

What to Do in this Unit:

- This unit uses Topic 1.3 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 3 Worksheet.
- Read Topic 1.3 beginning on page 44. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

Theme:

The four topics in the DNA Theme examine how DNA is the foundation for the unity and diversity of living things.

Goal:

The goal of this unit is to investigate how and why manipulation of an organism's genes occurs.

Objectives:

While completing this unit you will investigate how:

- DNA can be copied, modified, and inserted into other organisms.
- There are many uses for DNA technology.
- There are ethical questions and risks associated with biotechnology.

What to Do in this Unit:

- This unit uses Topic 1.4 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 4 Worksheet.
- Read Topic 1.4 beginning on page 70. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

- The cumulative assessment for this theme is an inquiry project into a topic of your choosing. Ask your teacher for the Inquiry Project #1 worksheet, then read and complete the work there.

Theme:

The four topics in the Chemistry Theme examine how chemical processes require energy change as atoms are rearranged.

Goal:

The goal of this unit is to investigate how chemical processes are part of our lives.

Objectives:

While completing this unit you will investigate how:

- Applications of chemistry are around you everywhere.
- Safe handling of chemicals helps us and our environment.

What to Do in this Unit:

- This unit uses Topic 2.1 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 5 Worksheet.
- Read Topic 2.1 beginning on page 102. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

Theme:

The four topics in the Chemistry Theme examine how chemical processes require energy change as atoms are rearranged.

Goal:

The goal of this unit is to investigate what happens to atoms in a chemical reaction.

Objectives:

While completing this unit you will investigate how:

- Atoms bond to form ionic or covalent compounds.
- Those bonds can be broken, rearranged, and new ones formed.
- Mass can't be created or destroyed in chemical reactions.
- What happens in a chemical reaction can be represented by a chemical equation.

What to Do in this Unit:

- This unit uses Topic 2.2 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 6 Worksheet.
- Read Topic 2.2 beginning on page 118. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

Theme:

The four topics in the Chemistry Theme examine how chemical processes require energy change as atoms are rearranged.

Goal:

The goal of this unit is to investigate how energy is involved in chemical processes.

Objectives:

While completing this unit you will investigate how:

- Matter and energy interact in physical and chemical changes.
- Energy is transferred between chemical reactions and the surroundings.

What to Do in this Unit:

- This unit uses Topic 2.3 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 7 Worksheet.
- Read Topic 2.4 beginning on page 138. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

Theme:

The four topics in the Chemistry Theme examine how chemical processes require energy change as atoms are rearranged.

Goal:

The goal of this unit is to investigate how atoms rearrange in different types of chemical reactions.

Objectives:

While completing this unit you will investigate how:

- Compounds break down in decomposition reactions and form in synthesis reactions.
- Elements replace other elements in replacement reactions.
- Heat and light are released in most combustion reactions.
- Acids react with bases in neutralization reactions.

What to Do in this Unit:

- This unit uses Topic 2.4 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 8 Worksheet.
- Read Topic 2.4 beginning on page 154. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then 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.

- The cumulative assessment for this theme is an inquiry project into a topic of your choosing. Ask your teacher for the Inquiry Project #2 worksheet, then read and complete the work there.

Theme:

The four topics in the Energy Theme examine how energy is conserved and how its transformation affects living things and the environment.

Goal:

The goal of this unit is to investigate what the properties of energy are.

Objectives:

While completing this unit you will investigate how:

- Energy can produce change in system.
- Energy comes in different forms.
- Energy can be transformed or transferred.
- Different forms of energy have different causes.

What to Do in this Unit:

- This unit uses Topic 3.1 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 9 Worksheet.
- Read Topic 3.1 beginning on page 192. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then when you are ready, ask your teacher for the Unit 9 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Theme:

The four topics in the Energy Theme examine how energy is conserved and how its transformation affects living things and the environment.

Goal:

The goal of this unit is to investigate how energy is transformed.

Objectives:

While completing this unit you will investigate how:

- Energy is transformed in chemical reactions.
- Energy is transformed in nuclear reactions.
- Energy is transformed when light energy interacts with matter.

What to Do in this Unit:

- This unit uses Topic 3.3 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 10 Worksheet.
- Read Topic 3.3 beginning on page 212. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then when you are ready, ask your teacher for the Unit 10 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Theme:

The four topics in the Energy Theme examine how energy is conserved and how its transformation affects living things and the environment.

Goal:

The goal of this unit is to investigate how energy transformation affects global systems and humans.

Objectives:

While completing this unit you will investigate how:

- Earth is a system with energy transformation.
- The transformation and transfer of solar and thermal energy heats the Earth's atmosphere.
- Earth's temperature is moderated by energy transformation and transfer.
- Ecosystems can be harmed by energy transformation and transfer.
- Energy transformation has benefits and risks.
- Technology can reduce the risks of energy transformation.
- We can learn to reduce the harm from energy transformation.

What to Do in this Unit:

- This unit uses Topic 3.3 and 3.4 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 11 Worksheet.
- Read Topic 3.3 beginning on page 242 followed by topic 3.4 beginning on page 264. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then when you are ready, ask your teacher for the Unit 11 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

- The cumulative assessment for this theme is an inquiry project into a topic of your choosing. Ask your teacher for the Inquiry Project #3 worksheet, then read and complete the work there.

Theme:

The four topics in the Universe Formation Theme examine how the formation of the universe can be explained by the Big Bang theory.

Goal:

The goal of this unit is to investigate what the universe is and how to make sense of it.

Objectives:

While completing this unit you will investigate how:

- Different peoples have different concepts of "universe."
- How we make sense of the universe depends on who we are, when we are, and what we know.

What to Do in this Unit:

- This unit uses Topic 4.1 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 12 Worksheet.
- Read Topic 4.1 beginning on page 292 and 4.2 beginning on page 300. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then when you are ready, ask your teacher for the Unit 12 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Theme:

The four topics in the Universe Formation Theme examine how the formation of the universe can be explained by the Big Bang theory.

Goal:

The goal of this unit is to investigate how we have learned a lot about the universe using only our eyes, and how technology has expanded our knowledge and understanding of the universe.

Objectives:

While completing this unit you will investigate how:

- A variety of objects appear in the sky in mostly predictable ways.
- The celestial sphere helps describe the appearance and motion of objects we see.
- We have invented devices that extend and enhance our sense of sight.
- We know that our galaxy is just one of billions of galaxies in the universe.
- There are vast distances separating stars and galaxies.
- We can understand star's life cycles by understanding their properties.

What to Do in this Unit:

- This unit uses Topics 4.2 and 4.3 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 13 Worksheet.
- Read Topic 4.2 beginning on page 300 and 4.3 beginning on page 320. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then when you are ready, ask your teacher for the Unit 13 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Theme:

The four topics in the Universe Formation Theme examine how the formation of the universe can be explained by the Big Bang theory.

Goal:

The goal of this unit is to investigate how the Big Bang theory helps explain what we know about the universe.

Objectives:

While completing this unit you will investigate how:

- The Big Bang theory is based on redshift and cosmic background radiation evidence.
- The Big Bang theory helps us describe how the universe formed and changed over time.
- There is much about the universe we can't explain yet.

What to Do in this Unit:

- This unit uses Topic 4.4 in the *BC Science Connections 10* textbook.
- Ask your teacher for the Unit 14 Worksheet.
- Read Topic 4.4 beginning on page 352. Remember it is best to read the whole chapter to get an overview of the content before you attempt to answer the questions on the worksheet.
- Answer the questions on the worksheet and be sure you know the definitions of the words in bold found throughout the chapter. At least some of them are sure to be on the test!

- If you have chosen to skip the Student Inquiry portion of the worksheet, then when you are ready, ask your teacher for the Unit 14 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

- The cumulative assessment for this theme is an inquiry project into a topic of your choosing. Ask your teacher for the Inquiry Project #4 worksheet, then read and complete the work there.

Congratulations! You've finished Science 10!