

Mapping Cambridge Secondary 1 Science (Stages 7–9) to Florida Science Standards (Grades 6–8)

Introduction

Cambridge International Examinations has mapped the Cambridge Secondary 1 Science (Stages 7–9) to Florida Science Standards (Grades 6–8). This mapping document shows where the Florida Science standards are covered in the Cambridge Secondary 1 Science Framework and schemes of work.

The Cambridge Secondary 1 Framework provides a comprehensive set of progressive learning objectives for Science. The objectives detail what the learner should know or what they should be able to do in Science in Stages 7 to 9 (the equivalent of the US Grades 6 to 8) of secondary education. They provide a structure for teaching and learning and a reference against which learners' ability and understanding can be checked. Each learning objective has a unique curriculum framework code, e.g. **7Ep1**. These codes appear in the Cambridge Teacher Guide, schemes of work and other published resources. Codes in red indicate where learning objectives are mapped to a different grade from the equivalent Cambridge stage, e.g. where **8Bh3** (Cambridge Stage 8) is mapped to Grade 6 (rather than Grade 7). Cambridge learning objectives may be mapped to more than one Florida grade. Some Florida content may map more explicitly to Cambridge Primary Science.

The Cambridge Secondary 1 Science Framework is divided into four strands: Scientific enquiry, Biology, Chemistry and Physics. The scientific enquiry learning objectives may be met through teaching the content in the other three strands and are therefore listed separately at the beginning of each grade/stage. The scientific enquiry learning objectives are only mapped to individual Florida science standards where there is an explicit link. They are italicised for easy identification, e.g. *7Ep1 Be able to talk about the importance of questions, evidence and explanations.*

Cambridge Secondary 1 Science Teacher Guide Appendix D – Opportunities for ICT outlines where in the Cambridge Secondary 1 Curriculum Framework opportunities for using ICT may be used if the equipment is available. A copy of the Teacher Guide and schemes of work, can be found at <https://cambridgesecondary1.cie.org.uk/>

Contents (click on page number)

Florida Grade 6	2
Florida Grade 7	12
Florida Grade 8	22

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
Key ideas and details	Framework – learning objectives	Scheme of work – units
	<p>Scientific enquiry learning objectives:</p> <p><i>7Ep1 Be able to talk about the importance of questions, evidence and explanations.</i></p> <p><i>7Ep2 Make predictions and review them against evidence.</i></p> <p><i>7Ep3 Suggest ideas that may be tested.</i></p> <p><i>7Ep4 Outline plans to carry out investigations, considering the variables to control, change or observe.</i></p> <p><i>7Ep5 Make predictions referring to previous scientific knowledge and understanding.</i></p> <p><i>7Ep6 Identify appropriate evidence to collect and suitable methods of collection.</i></p> <p><i>7Ep7 Choose appropriate apparatus and use it correctly.</i></p> <p><i>7Eo1 Make careful observations including measurements.</i></p> <p><i>7Eo2 Present results in the form of tables, bar charts and line graphs.</i></p> <p><i>7Eo3 Use information from secondary sources.</i></p> <p><i>7Ec1 Make conclusions from collected data, including those presented in a graph, chart or spreadsheet.</i></p> <p><i>7Ec2 Recognise results and observations that do not fit into a pattern, including those presented in a graph, chart or spreadsheet.</i></p> <p><i>7Ec3 Consider explanations for predictions using scientific knowledge and understanding and communicate these.</i></p> <p><i>7Ec4 Present conclusions using different methods.</i></p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
EARTH AND SPACE SCIENCE		
SC.6.E.6.1 Describe and give examples of ways in which Earth's surface is built up and torn down by physical and chemical weathering, erosion, and deposition.		
SC.6.E.6.2 Recognize that there are a variety of different landforms on Earth's surface such as coastlines, dunes, rivers, mountains, glaciers, deltas, and lakes and relate these landforms as they apply to Florida.		
SC.6.E.7.1 Differentiate among radiation, conduction, and convection, the three mechanisms by which heat is transferred through Earth's system.	9Pe2 Identify and explain the thermal (heat) energy transfer processes of conduction, convection and radiation.	Unit 9.8 Chemicals and Thermal Energy
SC.6.E.7.2 Investigate and apply how the cycling of water between the atmosphere and hydrosphere has an effect on weather patterns and climate.		
SC.6.E.7.3 Describe how global patterns such as the jet stream and ocean currents influence local weather in measurable terms such as temperature, air pressure, wind direction and speed, and humidity and precipitation.		
SC.6.E.7.4 Differentiate and show interactions among the geosphere, hydrosphere, cryosphere, atmosphere, and biosphere.		
SC.6.E.7.5 Explain how energy provided by the sun influences global patterns of atmospheric movement and the temperature differences between air, water, and land.		Although the effect of energy from the sun on global patterns is not explicitly referenced, this content could be integrated into Unit 7.3 Energy Transformations.

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
SC.6.E.7.6 Differentiate between weather and climate.		
SC.6.E.7.7 Investigate how natural disasters have affected human life in Florida.		
SC.6.E.7.8 Describe ways human beings protect themselves from hazardous weather and sun exposure.		
SC.6.E.7.9 Describe how the composition and structure of the atmosphere protects life and insulates the planet.		
LIFE SCIENCE		
SC.6.L.14.1 Describe and identify patterns in the hierarchical organization of organisms from atoms to molecules and cells to tissues to organs to organ systems to organisms.	7Bc6 Understand that cells can be grouped together to form tissues, organs and organisms.	Unit 7.1 Living Things <i>Although hierarchical organisation of atoms to molecules is not explicitly referenced, this content could be integrated into Unit 8.2 Elements, Mixtures and Compounds.</i>
SC.6.L.14.2 Investigate and explain the components of the scientific theory of cells (cell theory): all organisms are composed of cells (single-celled or multi-cellular), all cells come from pre-existing cells, and cells are the basic unit of life.		Although cell theory is not explicitly referenced, this content could be integrated into Unit 7.1 Living Things.
SC.6.L.14.3 Recognize and explore how cells of all organisms undergo similar processes to maintain homeostasis, including extracting energy from food, getting rid of waste, and reproducing.	7Bc5 Relate the structure of some common cells to their functions. Secondary sources can be used.	Unit 7.1 Living Things Homeostasis is not included in in the Cambridge Secondary 1 curriculum.

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
SC.6.L.14.4 Compare and contrast the structure and function of major organelles of plant and animal cells, including cell wall, cell membrane, nucleus, cytoplasm, chloroplasts, mitochondria, and vacuoles.	7Bc3 Identify the structures present in plant and animal cells as seen with a simple light microscope and/or a computer microscope. 7Bc4 Compare the structure of plant and animal cells.	Unit 7.1 Living Things Although functions of organelles are not explicitly referenced, this content could be integrated into Unit 7.1 Living Things.
SC.6.L.14.5 Identify and investigate the general functions of the major systems of the human body (digestive, respiratory, circulatory, reproductive, excretory, immune, nervous, and musculoskeletal) and describe ways these systems interact with each other to maintain homeostasis.	7Bh2 Recognise the positions and know the functions of the major organ systems of the human body. Secondary sources can be used. 7Bh1 Explore the role of the skeleton and joints and the principle of antagonistic muscles. 8Bh3 Recognise the organs of the alimentary canal and know their functions. Secondary sources can be used. 8Bh8 Recognise the basic components of the respiratory system and know their functions. 8Bh5 Recognise and model the basic components of the circulatory system and know their functions. 8Bh13 Describe the human reproductive system, including the menstrual cycle, fertilisation and foetal development.	Unit 7.1 Living Things Unit 7.1 Living Things Unit 8.1 Obtaining Food Unit 8.4 Respiration and Circulation Unit 8.4 Respiration and Circulation Unit 8.7 Reproduction and Growth Excretory, immune and nervous systems are not included in the Cambridge Secondary 1 curriculum.

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Florida Grade 6	Stage 7	
SC.6.L.14.6 Compare and contrast types of infectious agents that may infect the human body, including viruses, bacteria, fungi, and parasites.	7Bc2 Know about the role of micro-organisms in the breakdown of organic matter, food production and disease, including the work of Louis Pasteur.	Unit 7.4 Microorganisms and Disease Although parasites are not explicitly referenced, this content could be integrated into Unit 7.4 Microorganisms and Disease.
SC.6.L.15.1 Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains.	7Bv3 Classify animals and plants into major groups, using some locally occurring examples. 7Bv1 Understand what is meant by a species.	Unit 7.6 Putting Things into Groups Domains are not included in the Cambridge Secondary 1 curriculum.
NATURE OF SCIENCE		
SC.6.N.1.1 Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.	<i>7Ep3 Suggest ideas that may be tested.</i> <i>7Eo3 Use information from secondary sources.</i> <i>7Ep2 Make predictions and review them against evidence.</i> <i>7Ep4 Outline plans to carry out investigations, considering the variables to control, change or observe.</i> <i>8Ep4 Plan investigations to test ideas.</i> <i>7Eo1 Make careful observations including measurements.</i> <i>7Eo2 Present results in the form of tables, bar charts and line graphs.</i> <i>7Ec1 Make conclusions from collected data,</i>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
	<i>including those presented in a graph, chart or spreadsheet.</i> <i>7Ec3 Consider explanations for predictions using scientific knowledge and understanding and communicate these.</i>	
SC.6.N.1.2 Explain why scientific investigations should be replicable.		
SC.6.N.1.3 Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each.		
SC.6.N.1.4 Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.	<i>9Ec6 Compare results and methods used by others.</i>	
SC.6.N.1.5 Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.	<i>8Ep1 Discuss the importance of developing empirical questions which can be investigated, collecting evidence, developing explanations and using creative thinking.</i>	
SC.6.N.2.1 Distinguish science from other activities involving thought.		
SC.6.N.2.2 Explain that scientific knowledge is durable because it is open to change as new evidence or interpretations are encountered.		

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
SC.6.N.2.3 Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals.	<p>9Cp4 Talk about the contribution of scientists. Secondary sources can be used.</p> <p>7Bh3 Research the work of scientists studying the human body.</p> <p>9Be2 Research the work of scientists studying the natural world. Secondary sources can be used.</p> <p><i>9Ep3 Discuss the way that scientists work today and how they worked in the past, including reference to experimentation, evidence and creative thought.</i></p> <p>9Cp1 Describe the structure of an atom and learn about the methods and discoveries of Rutherford.</p>	<p>Unit 9.2 The Periodic Table and Preparing Salts</p> <p>Unit 7.4 Microorganisms and Disease</p> <p>Unit 9.7 Ecology</p> <p>Unit 9.2 The Periodic table and Preparing Salts</p>
SC.6.N.3.1 Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life.		
SC.6.N.3.2 Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws.		
SC.6.N.3.3 Give several examples of scientific laws.		

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
SC.6.N.3.4 Identify the role of models in the context of the sixth grade science benchmarks.		
PHYSICAL SCIENCE		
SC.6.P.11.1 Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.	7Pe1 Understand that energy cannot be created or destroyed and that energy is always conserved. 7Pe2 Recognise different energy types and energy transfers.	Unit 7.3 Energy Transformations
SC.6.P.12.1 Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.	8Pf1 Calculate average speeds, including through the use of timing gates. 8Pf2 Interpret simple distance/time graphs. 8Eo1 Take appropriately accurate measurements. 8Eo4 Present results as appropriate in tables and graphs.	Unit 8.9 Forces and Magnets
SC.6.P.13.1 Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.	7Pf1 Describe the effects of forces on motion, including friction and air resistance. 7Pf2 Describe the effect of gravity on objects. Secondary sources can be used. 8Pm1 Describe the properties of magnets.	Unit 7.9 Forces and their Effects Unit 7.9 Forces and their Effects Unit 8.9 Forces and Magnets

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
SC.6.P.13.2 Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are.	7Pf2 Describe the effect of gravity on objects. Secondary sources can be used.	Unit 7.9 Forces and their Effects
SC.6.P.13.3 Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.	7Pf1 Describe the effects of forces on motion, including friction and air resistance.	Unit 7.9 Forces and their Effects Investigating unbalanced forces on the speed and/or direction of objects is not included in the Cambridge Secondary 1 curriculum.
	<p>Stage 7 Curriculum Framework learning objectives not mapped (excluding Scientific Enquiry learning objectives):</p> <p>7Bp1 Recognise the positions, and know the functions of the major organs of flowering plants, e.g. root, stem, leaf.</p> <p>7Bc1 Identify the seven characteristics of living things and relate these to a wide range of organisms in the local and wider environment.</p> <p>7Be1 Describe how organisms are adapted to their habitat, drawing on locally occurring examples. Secondary sources can be used.</p> <p>7Be2 Draw and model simple food chains.</p> <p>7Be4 Discuss a range of energy sources and distinguish between renewable and non-renewable resources. Secondary sources can be used.</p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 6	Stage 7	
	<p>7Cp1 Distinguish between metals and non-metals.</p> <p>7Cc3 Use indicators to distinguish acid and alkaline solutions.</p> <p>7Pb1 Describe how the movement of the Earth causes the <i>apparent</i> daily and annual movement of the sun and the stars.</p> <p>7Pb4 Understand that the sun and other stars are sources of light and that planets and other bodies are seen by reflected light.</p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
Key ideas and details	Framework – learning objectives	Scheme of work – units
	<p>Scientific enquiry learning objectives:</p> <p><i>8Ep1 Discuss the importance of developing empirical questions which can be investigated, collecting evidence, developing explanations and using creative thinking.</i></p> <p><i>8Ep2 Test predictions with reference to evidence gained.</i></p> <p><i>8Ep3 Select ideas and turn them into a form that can be tested.</i></p> <p><i>8Ep4 Plan investigations to test ideas.</i></p> <p><i>8Ep5 Identify important variables; choose which variables to change, control and measure.</i></p> <p><i>8Ep6 Make predictions using scientific knowledge and understanding.</i></p> <p><i>8Eo1 Take appropriately accurate measurements.</i></p> <p><i>8Eo2 Use a range of equipment correctly.</i></p> <p><i>8Eo3 Discuss and control risks to themselves and others.</i></p> <p><i>8Eo4 Present results as appropriate in tables and graphs.</i></p> <p><i>8Ec1 Make simple calculations.</i></p> <p><i>8Ec2 Identify trends and patterns in results (correlations).</i></p> <p><i>8Ec3 Compare results with predictions.</i></p> <p><i>8Ec4 Identify anomalous results and suggest improvements to investigations.</i></p> <p><i>8Ec5 Interpret data from secondary sources.</i></p> <p><i>8Ec6 Discuss explanations for results using scientific knowledge and understanding. Communicate these clearly to others.</i></p>	

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Florida Grade 7	Stage 8	
	<i>8Ec7 Present conclusions to others in appropriate ways.</i>	
EARTH AND SPACE SCIENCE		
SC.7.E.6.1 Describe the layers of the solid Earth, including the lithosphere, the hot convecting mantle, and the dense metallic liquid and solid cores.	7Ce2 Research simple models of the internal structure of the Earth.	Unit 7.5 The Earth and Beyond
SC.7.E.6.2 Identify the patterns within the rock cycle and relate them to surface events (weathering and erosion) and sub-surface events (plate tectonics and mountain building).	7Ce1 Observe and classify different types of rocks and soils.	Not all of the content is explicitly referenced, but could be integrated into Unit 7.5 The Earth and Beyond
SC.7.E.6.3 Identify current methods for measuring the age of Earth and its parts, including the law of superposition and radioactive dating.	7Ce4 Discuss the fossil record as a guide to estimating the age of the Earth. 7Ce5 Learn about most recent estimates of the age of the Earth.	Unit 7.5 The Earth and Beyond
SC.7.E.6.4 Explain and give examples of how physical evidence supports scientific theories that Earth has evolved over geologic time due to natural processes.		
SC.7.E.6.5 Explore the scientific theory of plate tectonics by describing how the movement of Earth's crustal plates causes both slow and rapid changes in Earth's surface, including volcanic eruptions, earthquakes, and mountain building.		

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
SC.7.E.6.6 Identify the impact that humans have had on Earth, such as deforestation, urbanization, desertification, erosion, air and water quality, changing the flow of water.	7Be3 Discuss positive and negative influence of humans on the environment, e.g. the effect on food chains, pollution and ozone depletion. 9Be6 Describe and investigate some effects of human influences on the environment.	Unit 7.7 Habitats and Environment Unit 9.9 The Energy Crisis and Human Influences
SC.7.E.6.7 Recognize that heat flow and movement of material within Earth causes earthquakes and volcanic eruptions, and creates mountains and ocean basins.		
LIFE SCIENCE		
SC.7.L.15.1 Recognize that fossil evidence is consistent with the scientific theory of evolution that living things evolved from earlier species.	7Ce3 Examine fossils and research the fossil record.	Unit 7.5 The Earth and Beyond
SC.7.L.15.2 Explore the scientific theory of evolution by recognizing and explaining ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.	7Bv2 Investigate variation within a species. Secondary sources can be used. 9Bv4 Discuss the work of Darwin in developing the scientific theory of natural selection.	Unit 7.6 Putting Things into Groups Unit 9.7 Ecology
SC.7.L.15.3 Explore the scientific theory of evolution by relating how the inability of a species to adapt within a changing environment may contribute to the extinction of that species.		
SC.7.L.16.1 Understand and explain that every organism requires a set of instructions that specifies its traits, that this hereditary information (DNA) contains genes located in the chromosomes of each cell, and that heredity is the passage of these instructions from one generation to another.	9Bv2 Understand that organisms inherit characteristics from their parents through genetic material that is carried in cell nuclei.	Unit 9.7 Ecology DNA and chromosomes are not included in the Cambridge Secondary 1 curriculum.

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
SC.7.L.16.2 Determine the probabilities for genotype and phenotype combinations using Punnett Squares and pedigrees.		
SC.7.L.16.3 Compare and contrast the general processes of sexual reproduction requiring meiosis and asexual reproduction requiring mitosis.		
SC.7.L.16.4 Recognize and explore the impact of biotechnology (cloning, genetic engineering, artificial selection) on the individual, society and the environment.	9Bv3 Describe how selective breeding can lead to new varieties.	Unit 9.7 Ecology Apart from artificial selection (selective breeding) biotechnology is not included in the Cambridge Secondary 1 curriculum.
SC.7.L.17.1 Explain and illustrate the roles of and relationships among producers, consumers, and decomposers in the process of energy transfer in a food web.	9Be3 Explain and model food chains, food webs and energy flow.	Unit 9.7 Ecology
SC.7.L.17.2 Compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.		
SC.7.L.17.3 Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.	9Be5 Describe factors affecting the size of populations.	Unit 9.9 The Energy Crisis and Human Influences
NATURE OF SCIENCE		
SC.7.N.1.1 Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data,	7Eo3 Use information from secondary sources. 8Ep2 Test predictions with reference to evidence gained.	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
<p>interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.</p>	<p><i>8Ep3 Select ideas and turn them into a form that can be tested.</i></p> <p><i>8Ep4 Plan investigations to test ideas.</i></p> <p><i>8Ep5 Identify important variables; choose which variables to change, control and measure.</i></p> <p><i>8Ep6 Make predictions using scientific knowledge and understanding.</i></p> <p><i>8Eo1 Take appropriately accurate measurements.</i></p> <p><i>8Eo2 Use a range of equipment correctly.</i></p> <p><i>8Eo4 Present results as appropriate in tables and graphs.</i></p> <p><i>8Ec1 Make simple calculations.</i></p> <p><i>8Ec2 Identify trends and patterns in results (correlations).</i></p> <p><i>8Ec3 Compare results with predictions.</i></p> <p><i>8Ec6 Discuss explanations for results using scientific knowledge and understanding. Communicate these clearly to others.</i></p> <p><i>8Ec7 Present conclusions to others in appropriate ways.</i></p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
SC.7.N.1.2 Differentiate replication (by others) from repetition (multiple trials).	<i>9Eo1 Make sufficient observations and measurements to reduce error and make results more reliable.</i> <i>9Ec6 Compare results and methods used by others.</i>	
SC.7.N.1.3 Distinguish between an experiment (which must involve the identification and control of variables) and other forms of scientific investigation and explain that not all scientific knowledge is derived from experimentation.		
SC.7.N.1.4 Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.	<i>8Ep5 Identify important variables; choose which variables to change, control and measure.</i>	
SC.7.N.1.5 Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.		
SC.7.N.1.6 Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.	<i>8Ep1 Discuss the importance of developing empirical questions which can be investigated, collecting evidence, developing explanations and using creative thinking.</i>	
SC.7.N.1.7 Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.		

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
SC.7.N.2.1 Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.	7Pb3 Discuss the impact of the ideas and discoveries of Copernicus, Galileo and more recent scientists.	Unit 7.5 The Earth and Beyond
SC.7.N.3.1 Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that supports them.		
SC.7.N.3.2 Identify the benefits and limitations of the use of scientific models.		
PHYSICAL SCIENCE		
SC.7.P.10.1 Illustrate that the sun's energy arrives as radiation with a wide range of wavelengths, including infrared, visible, and ultraviolet, and that white light is made up of a spectrum of many different colors.	8PI5 Explain the dispersion of white light.	Not all of the content is explicitly referenced, but could be integrated into Unit 8.3 Light.
SC.7.P.10.2 Observe and explain that light can be reflected, refracted, and/or absorbed.	8PI3 Describe reflection at a plane surface and use the law of reflection. 8PI4 Investigate refraction at the boundary between air and glass or air and water. 8PI6 Explain colour addition and subtraction, and the absorption and reflection of coloured light.	Unit 8.3 Light
SC.7.P.10.3 Recognize that light waves, sound waves, and other waves move at different speeds in different materials.	8Ps1 Explain the properties of sound in terms of movement of air particles. 8PI1 Use light travelling in a straight line to	General properties of waves could be integrated into Unit 8.3 Light and/or Unit 8.6 Sound.

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
	explain the formation of shadows and other phenomena.	
SC.7.P.11.1 Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.	8Cs1 Show how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state, gas pressure and diffusion.	Unit 8.2 Elements, Mixtures and Compounds
SC.7.P.11.2 Investigate and describe the transformation of energy from one form to another.	7Pe2 Recognise different energy types and energy transfers.	Unit 7.3 Energy Transformations
SC.7.P.11.3 Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.		Although citing evidence to explain that energy cannot be created nor destroyed is not explicitly referenced, this content could be integrated into Unit 7.3 Energy Transformations.
SC.7.P.11.4 Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature.	9Pe2 Identify and explain the thermal (heat) energy transfer processes of conduction, convection and radiation.	Unit 9.8 Chemicals and Thermal Energy
	Stage 8 Curriculum Framework learning objectives not mapped (excluding Scientific Enquiry learning objectives): 8Bp2 Describe the absorption and transport of water and mineral salts in flowering plants. 8Bh1 Identify the constituents of a balanced diet and the functions of various nutrients.	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
	<p>Secondary sources can be used.</p> <p>8Bh2 Understand the effects of nutritional deficiencies.</p> <p>8Bh4 Understand the function of enzymes as biological catalysts in breaking down food to simple chemicals.</p> <p>8Bh6 Understand the relationship between diet and fitness.</p> <p>8Bh7 Discuss how conception, growth, development, behaviour and health can be affected by diet, drugs and disease.</p> <p>8Bh10 Explain gaseous exchange.</p> <p>8Bh11 Describe the effects of smoking. Secondary sources can be used.</p> <p>8Bh12 Discuss the physical and emotional changes that take place during adolescence.</p> <p>8Cp1 Describe and explain the differences between metals and non-metals.</p> <p>8Cp2 Give chemical symbols for the first twenty elements of the Periodic Table.</p> <p>8Cc1 Use a word equation to describe a common reaction. Secondary sources can be used.</p> <p>8Cc2 Describe chemical reactions which are</p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 7	Stage 8	
	<p>not useful, e.g. rusting.</p> <p>8Ps2 Recognise the link between loudness and amplitude, pitch and frequency, using an oscilloscope.</p> <p>8PI2 Describe how non-luminous objects are seen.</p> <p>8Pm2 Recognise and reproduce the magnetic field pattern of a bar magnet.</p> <p>8Pm3 Construct and use an electromagnet.</p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
Key ideas and details	Framework – learning objectives	Scheme of work – units
	<p>Scientific enquiry learning objectives:</p> <p><i>9Ep1 Discuss and explain the importance of questions, evidence and explanations, using historical and contemporary examples.</i></p> <p><i>9Ep2 Test explanations by using them to make predictions and then evaluate these against evidence.</i></p> <p><i>9Ep3 Discuss the way that scientists work today and how they worked in the past, including reference to experimentation, evidence and creative thought.</i></p> <p><i>9Ep4 Select ideas and produce plans for testing based on previous knowledge, understanding and research.</i></p> <p><i>9Ep5 Suggest and use preliminary work to decide how to carry out an investigation.</i></p> <p><i>9Ep6 Decide whether to use evidence from first hand experience or secondary sources.</i></p> <p><i>9Ep7 Decide which measurements and observations are necessary and what equipment to use.</i></p> <p><i>9Ep8 Decide which apparatus to use and assess any hazards in the laboratory, field or workplace.</i></p> <p><i>9Ep9 Use appropriate sampling techniques where required.</i></p> <p><i>9Eo1 Make sufficient observations and measurements to reduce error and make results more reliable.</i></p> <p><i>9Eo2 Use a range of materials and equipment and control risks.</i></p> <p><i>9Eo3 Make observations and measurements.</i></p> <p><i>9Eo4 Choose the best way to present results.</i></p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
	<p><i>9Ec1 Describe patterns (correlations) seen in results.</i></p> <p><i>9Ec2 Interpret results using scientific knowledge and understanding.</i></p> <p><i>9Ec3 Look critically at sources of secondary data.</i></p> <p><i>9Ec4 Draw conclusions.</i></p> <p><i>9Ec5 Evaluate the methods used and refine for further investigations.</i></p> <p><i>9Ec6 Compare results and methods used by others.</i></p> <p><i>9Ec7 Present conclusions and evaluation of working methods in different ways.</i></p> <p><i>9Ec8 Explain results using scientific knowledge and understanding. Communicate this clearly to others.</i></p>	
EARTH AND SPACE SCIENCE		
SC.8.E.5.1 Recognize that there are enormous distances between objects in space and apply our knowledge of light and space travel to understand this distance.		<p>Although this topic is not explicitly referenced, this content could be integrated into Unit 7.5 The Earth and Beyond.</p>
SC.8.E.5.10 Assess how technology is essential to science for such purposes as access to outer space and other remote locations, sample collection, measurement, data collection and storage, computation, and communication of information.		
SC.8.E.5.11 Identify and compare characteristics of the electromagnetic spectrum such as wavelength, frequency, use, and hazards and recognize its application to an understanding of planetary images and satellite photographs.		

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
SC.8.E.5.12 Summarize the effects of space exploration on the economy and culture of Florida.		
SC.8.E.5.2 Recognize that the universe contains many billions of galaxies and that each galaxy contains many billions of stars.		Although numbers of galaxies and stars are not explicitly referenced, this content could be integrated into Unit 7.5 The Earth and Beyond.
SC.8.E.5.3 Distinguish the hierarchical relationships between planets and other astronomical bodies relative to solar system, galaxy, and universe, including distance, size, and composition.		Although hierarchical relationships are not explicitly referenced, this content could be integrated into Unit 7.5 The Earth and Beyond.
SC.8.E.5.4 Explore the Law of Universal Gravitation by explaining the role that gravity plays in the formation of planets, stars, and solar systems and in determining their motions.		
SC.8.E.5.5 Describe and classify specific physical properties of stars: apparent magnitude (brightness), temperature (color), size, and luminosity (absolute brightness).		
SC.8.E.5.6 Create models of solar properties including: rotation, structure of the Sun, convection, sunspots, solar flares, and prominences.		
SC.8.E.5.7 Compare and contrast the properties of objects in the Solar System including the Sun, planets, and moons to those of Earth, such as gravitational force, distance from the Sun, speed, movement, temperature, and atmospheric conditions.	7Pb2 Describe the relative position and movement of the planets and the sun in the solar system.	Unit 7.5 The Earth and Beyond. Apart from position and movement, other properties of objects in the Solar System are not included in the Cambridge Secondary 1 curriculum.

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
SC.8.E.5.8 Compare various historical models of the Solar System, including geocentric and heliocentric.	7Pb3 Discuss the impact of the ideas and discoveries of Copernicus, Galileo and more recent scientists.	Unit 7.5 The Earth and Beyond.
SC.8.E.5.9 Explain the impact of objects in space on each other including: <ol style="list-style-type: none"> 1. the Sun on the Earth including seasons and gravitational attraction 2. the Moon on the Earth, including phases, tides, and eclipses, and the relative position of each body. 		
LIFE SCIENCE		
SC.8.L.18.1 Describe and investigate the process of photosynthesis, such as the roles of light, carbon dioxide, water and chlorophyll production of food release of oxygen.	8Bp1 Explore how plants need carbon dioxide, water and light for photosynthesis in order to make biomass and oxygen. 9Bp1 Define and describe photosynthesis, and use the word equation.	Unit 8.1 Obtaining Food Unit 9.1 Photosynthesis and Plant Growth
SC.8.L.18.2 Describe and investigate how cellular respiration breaks down food to provide energy and releases carbon dioxide.	8Bh9 Define and describe aerobic respiration, and use the word equation.	8.4 Respiration and Circulation

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
SC.8.L.18.3 Construct a scientific model of the carbon cycle to show how matter and energy are continuously transferred within and between organisms and their physical environment.		Although the carbon cycle is not explicitly referenced, this content could be integrated into Unit 9.7 Ecology.
SC.8.L.18.4 Cite evidence that living systems follow the Laws of Conservation of Mass and Energy.		
NATURE OF SCIENCE		
SC.8.N.1.1 Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.	<p><i>9Ep2 Test explanations by using them to make predictions and then evaluate these against evidence.</i></p> <p><i>9Ep4 Select ideas and produce plans for testing based on previous knowledge, understanding and research.</i></p> <p><i>9Ep5 Suggest and use preliminary work to decide how to carry out an investigation.</i></p> <p><i>9Ep6 Decide whether to use evidence from first hand experience or secondary sources.</i></p> <p><i>9Ep7 Decide which measurements and observations are necessary and what equipment to use.</i></p> <p><i>9Ep8 Decide which apparatus to use and assess any hazards in the laboratory, field or workplace.</i></p> <p><i>9Ep9 Use appropriate sampling techniques where required.</i></p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
	<p><i>9Eo1 Make sufficient observations and measurements to reduce error and make results more reliable.</i></p> <p><i>9Eo2 Use a range of materials and equipment and control risks.</i></p> <p><i>9Eo3 Make observations and measurements.</i></p> <p><i>9Ec1 Describe patterns (correlations) seen in results.</i></p> <p><i>9Ec2 Interpret results using scientific knowledge and understanding.</i></p> <p><i>9Ec3 Look critically at sources of secondary data.</i></p> <p><i>9Ec4 Draw conclusions.</i></p> <p><i>9Ec7 Present conclusions and evaluation of working methods in different ways.</i></p> <p><i>9Ec8 Explain results using scientific knowledge and understanding. Communicate this clearly to others.</i></p>	
<p>SC.8.N.1.2 Design and conduct a study using repeated trials and replication.</p>	<p><i>9Ep5 Suggest and use preliminary work to decide how to carry out an investigation.</i></p> <p><i>9Eo1 Make sufficient observations and measurements to reduce error and make results more reliable.</i></p> <p><i>9Eo3 Make observations and measurements.</i></p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
SC.8.N.1.3 Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim.	<p><i>8Ec6 Discuss explanations for results using scientific knowledge and understanding. Communicate these clearly to others.</i></p> <p><i>9Ec2 Interpret results using scientific knowledge and understanding.</i></p> <p><i>9Ec4 Draw conclusions.</i></p> <p><i>8Ec7 Present conclusions to others in appropriate ways.</i></p> <p><i>9Ec8 Explain results using scientific knowledge and understanding. Communicate this clearly to others.</i></p>	
SC.8.N.1.4 Explain how hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by the data.		
SC.8.N.1.5 Analyze the methods used to develop a scientific explanation as seen in different fields of science.		
SC.8.N.1.6 Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.	<p><i>7Ep1 Be able to talk about the importance of questions, evidence and explanations.</i></p> <p><i>9Ep4 Select ideas and produce plans for testing based on previous knowledge, understanding and research.</i></p> <p><i>7Ep5 Make predictions referring to previous scientific knowledge and understanding.</i></p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
	<i>8Ep6 Make predictions using scientific knowledge and understanding.</i> <i>7Ep6 Identify appropriate evidence to collect and suitable methods of collection.</i>	
SC.8.N.2.1 Distinguish between scientific and pseudoscientific ideas.		
SC.8.N.2.2 Discuss what characterizes science and its methods.		
SC.8.N.3.1 Select models useful in relating the results of their own investigations.		
SC.8.N.3.2 Explain why theories may be modified but are rarely discarded.		
SC.8.N.4.1 Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels.		
SC.8.N.4.2 Explain how political, social, and economic concerns can affect science, and vice versa.		
PHYSICAL SCIENCE		
SC.8.P.8.1 Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.	<i>8Cp3 Understand that elements are made of atoms.</i> 9Cp1 Describe the structure of an atom and learn about the methods and discoveries of	<i>Unit 8.2 Elements, Mixtures and Compounds</i> Unit 9.2 The Periodic Table and Preparing Salts

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
	Rutherford. 7Cs1 Show in outline how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state. 8Cs1 Show how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state, gas pressure and diffusion.	Unit 7.2 Solids, Liquids and Gases Unit 8.2 Elements, Mixtures and Compounds
SC.8.P.8.2 Differentiate between weight and mass recognizing that weight is the amount of gravitational pull on an object and is distinct from, though proportional to, mass.		See the Cambridge Primary Science curriculum.
SC.8.P.8.3 Explore and describe the densities of various materials through measurement of their masses and volumes.	9Pf2 Determine densities of solids, liquids and gases.	Unit 9.6 Moments, Pressure and Density
SC.8.P.8.4 Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.	7Cp2 Describe everyday materials and their physical properties.	Unit 7.6 Putting Things into Groups
SC.8.P.8.5 Recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.		Although the number of elements and compounds is not explicitly referenced, this content could be integrated into Unit 8.2 Elements, Mixtures and Compounds.

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
SC.8.P.8.6 Recognize that elements are grouped in the periodic table according to similarities of their properties.	9Cp3 Describe trends in groups and periods.	Unit 9.2 The Periodic Table and Preparing Salts
SC.8.P.8.7 Explore the scientific theory of atoms (also known as atomic theory) by recognizing that atoms are the smallest unit of an element and are composed of sub-atomic particles (electrons surrounding a nucleus containing protons and neutrons).	8Cp3 Understand that elements are made of atoms. 9Cp1 Describe the structure of an atom and learn about the methods and discoveries of Rutherford.	Unit 8.2 Elements, Mixtures and Compounds Unit 9.2 The Periodic table and Preparing Salts
SC.8.P.8.8 Identify basic examples of and compare and classify the properties of compounds, including acids, bases, and salts.	7Cc1 Use a pH scale. 7Cc2 Understand neutralisation and some of its applications. 8Cp4 Explain the idea of compounds. 8Cp5 Name some common compounds including oxides, hydroxides, chlorides, sulfates and carbonates. 9Cc2 Describe the reactivity of metals with oxygen, water and dilute acids. 9Cc5 Explain how to prepare some common salts by the reactions of metals and metal carbonates and be able to write word equations for these reactions.	Unit 8.8 Chemical Reactions
SC.8.P.8.9 Distinguish among mixtures (including solutions) and pure substances.	8Cp6 Distinguish between elements, compounds and mixtures.	Unit 8.2 Elements, Mixtures and Compounds

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
SC.8.P.9.1 Explore the Law of Conservation of Mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes.		Although this content is not explicitly referenced, it could be integrated into Unit 8.2 Elements, Mixtures and Compounds.
SC.8.P.9.2 Differentiate between physical changes and chemical changes.		See the Cambridge Primary Science curriculum.
SC.8.P.9.3 Investigate and describe how temperature influences chemical changes.	9Cc6 Give an explanation of the effects of concentration, particle size, temperature and catalysts on the rate of a reaction.	Unit 9.5 Reactivity and Rates of Reaction
	Stage 9 Curriculum Framework learning objectives not mapped (excluding Scientific Enquiry learning objectives): 9Bp2 Understand the importance of water and mineral salts to plant growth. 9Bp3 Understand sexual reproduction in flowering plants, including pollination, fertilisation, seed formation and dispersal. 9Be1 Explain the ways in which living things are adapted to their habitats. Secondary sources can be used. 9Be4 Explain the role of decomposers. 9Bv1 Use and construct keys to identify plants and animals. 9Cp2 Compare the structures of the first twenty	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
	<p>elements of the Periodic Table.</p> <p>9Cc1 Explore and explain the idea of endothermic processes, e.g. melting of ice, and exothermic reactions, e.g. burning, oxidation.</p> <p>9Cc3 Explore and understand the reactivity series.</p> <p>9Cc4 Give examples of displacement reactions.</p> <p>9Pf1 Explain that pressure is caused by the action of a force on an area.</p> <p>9Pf3 Explain pressures in gases and liquids (qualitative only).</p> <p>9Pf4 Know that forces can cause objects to turn on a pivot and understand the principle of moments.</p> <p>9Pm1 Describe electrostatics and the concept of charge, including digital sensors.</p> <p>9Pm2 Interpret and draw simple parallel circuits.</p> <p>9Pm3 Model and explain how common types of components, including cells (batteries), affect current.</p> <p>9Pm4 Explain how current divides in parallel circuits.</p> <p>9Pm5 Measure current using ammeters and voltage using voltmeters, including digital</p>	

Florida Science Standards	Cambridge Secondary 1 Science	
Florida Grade 8	Stage 9	
	meters. 9Pe1 Use knowledge of energy sources including fossil fuels and renewable energy resources to consider the world's energy needs, including research from secondary sources. 9Pe3 Explain cooling by evaporation.	

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