

Grade 8 Science and IPC TEKS Comparison

Color Coding:						
Readiness	Supporting	Not tested	Not addressed	Partially addressed	Addressed	Knowledge & Skills
Grade 8		Notes correlating Grade 8 to IPC		IPC		
(5) Matter and Energy. The student knows that matter is composed of atoms and has chemical and physical properties. The student is expected to:				(6) Science concepts. The student knows that relationships exist between the structure and properties of matter. The student is expected to:		
(A) describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud;	Valence electrons are mentioned in IPC 7 (B). Structure of atom and subatomic particles are not addressed in IPC		(A) examine differences in physical properties of solids, liquids, and gases as explained by the arrangement and motion of atoms, ions, or molecules of the substances and the strength of the forces of attraction between those particles;			
(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;	Valence electrons are addressed in IPC 7 (B). Protons are not addressed. Chemical properties are addressed in IPC 6(B), 6(C), and 6(D)		(B) relate chemical properties of substances to the arrangement of their atoms or molecules;			
(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements;	Periodic Table is addressed in IPC 6(D)		(C) analyze physical and chemical properties of elements and compounds such as color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity;			
(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts;	Chemical formulas are not addressed in IPC.		(D) relate the physical and chemical behavior of an element, including bonding and classification, to its placement on the Periodic Table; and			
(E) investigate how evidence of chemical reactions indicate that new substances with different properties are formed; and	Evidences of chemical changes are not addressed except for a change in energy addressed in IPC 7(D). Chemical changes are addressed in IPC 7 (B)		(E) relate the structure of water to its function as a solvent and investigate the properties of solutions and factors affecting gas and solid solubility, including nature of solute, temperature, pressure, pH, and concentration.			
(F) recognize whether a chemical equation containing coefficients is balanced or not and how that relates to the law of conservation of mass.	The law of conservation of mass is addressed in IPC 7 (C).		(7) Science concepts. The student knows that changes in matter affect everyday life. The student is expected to:			
			(A) investigate changes of state as it relates to the arrangement of particles of matter and			

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		energy transfer;
		(B) recognize that chemical changes can occur when substances react to form different substances and that these interactions are largely determined by the valence electrons;
		(C) demonstrate that mass is conserved when substances undergo chemical change and that the number and kind of atoms are the same in the reactants and products;
		(D) analyze energy changes that accompany chemical reactions such as those occurring in heat packs, cold packs, and glow sticks and classify them as exothermic or endothermic reactions;
		(E) describe types of nuclear reactions such as fission and fusion and their roles in applications such as medicine and energy production; and
		(F) research and describe the environmental and economic impact of the end-products of chemical reactions such as those that may result in acid rain, degradation of water and air quality, and ozone depletion.
PHYSICS		
(6) Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to:		(4) Science concepts. The student knows concepts of force and motion evident in everyday life. The student is expected to:
(A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion;	Addressed in IPC 4 (A)	(A) describe and calculate an object's motion in terms of position, displacement, speed, and acceleration;
(B) differentiate between speed, velocity, and acceleration; and	Addressed in IPC 4 (A)	(B) measure and graph distance and speed as a function of time using moving toys;
(C) investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action reaction such as in vehicle restraints, sports activities, amusement	Addressed in IPC 4 (C), (D), (E)	(C) investigate how an object's motion changes only when a net force is applied, including activities and equipment such as toy cars, vehicle restraints, sports activities, and classroom

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park rides, Earth's tectonic activities, and rocket launches.		objects;
		(D) assess the relationship between force, mass, and acceleration, noting the relationship is independent of the nature of the force, using equipment such as dynamic carts, moving toys, vehicles, and falling objects;
		(E) apply the concept of conservation of momentum using action and reaction forces such as students on skateboards;
		(F) describe the gravitational attraction between objects of different masses at different distances, including satellites; and
		(G) examine electrical force as a universal force between any two charged objects and compare the relative strength of the electrical force and gravitational force.
		(5) Science concepts. The student recognizes multiple forms of energy and knows the impact of energy transfer and energy conservation in everyday life. The student is expected to:
		(A) recognize and demonstrate that objects and substances in motion have kinetic energy such as vibration of atoms, water flowing down a stream moving pebbles, and bowling balls knocking down pins;
		(B) demonstrate common forms of potential energy, including gravitational, elastic, and chemical, such as a ball on an inclined plane, springs, and batteries;
		(C) demonstrate that moving electric charges produce magnetic forces and moving magnets produce electric forces;
		(D) investigate the law of conservation of energy;
		(E) investigate and demonstrate the movement

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		of thermal energy through solids, liquids, and gases by convection, conduction, and radiation such as in weather, living, and mechanical systems;
		(F) evaluate the transfer of electrical energy in series and parallel circuits and conductive materials;
		(G) explore the characteristics and behaviors of energy transferred by waves, including acoustic, seismic, light, and waves on water as they superpose on one another, bend around corners, reflect off surfaces, are absorbed by materials, and change direction when entering new materials;
		(H) analyze energy conversions such as those from radiant, nuclear, and geothermal sources; fossil fuels such as coal, gas, oil; and the movement of water or wind; and
		(I) critique the advantages and disadvantages of various energy sources and their impact on society and the environment.
EARTH AND SPACE SCIENCE		
(7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:		
(A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons;	Not covered in IPC	
(B) demonstrate and predict the sequence of events in the lunar cycle; and	Not covered in IPC	
(C) relate the position of the Moon and Sun to their effect on ocean tides.	Not covered in IPC	
(8) Earth and space. The student knows characteristics of the universe. The student is		

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expected to:		
(A) describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification;	Not covered in IPC	
(B) recognize that the Sun is a medium-sized star near the edge of a disc-shaped galaxy of stars and that the Sun is many thousands of times closer to Earth than any other star;	Not covered in IPC	
(C) explore how different wavelengths of the electromagnetic spectrum such as light and radio waves are used to gain information about distances and properties of components in the universe;	Addressed in IPC 5(G)	
(D) model and describe how light years are used to measure distances and sizes in the universe; and	Not covered in IPC	
(E) research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.	Not covered in IPC	
(9) Earth and space. The student knows that natural events can impact Earth systems. The student is expected to:		
(A) describe the historical development of evidence that supports plate tectonic theory;	Not covered in IPC	
(B) relate plate tectonics to the formation of crustal features; and	Not covered in IPC	
(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.	Not covered in IPC	
(10) Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to:		
(A) recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds and ocean currents;	Convection is covered in IPC 5 (E)	

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(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and	Not covered in IPC	
(C) identify the role of the oceans in the formation of weather systems such as hurricanes.	Not covered in IPC	
LIFE SCIENCE		
(11) Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. The student is expected to:		
(A) describe producer/consumer, predator/prey, and parasite/host relationships as they occur in food webs within marine, freshwater, and terrestrial ecosystems;	Not covered in IPC	
(B) investigate how organisms and populations in an ecosystem depend on and may compete for biotic and abiotic factors such as quantity of light, water, range of temperatures, or soil composition;	Not covered in IPC	
(C) explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and	Not covered in IPC	
(D) recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.	Not covered in IPC	

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Comments:

Typical time frame for Grade 8 Science:

Reporting Category 1 (Chemistry): 8 weeks

Reporting Category 2 (Physics): 4 weeks

Reporting Category 3 (Earth and Space Science): 6-8 weeks not covered in IPC

Reporting Category 4 (Life and Review): 3 weeks not covered in IPC

This document only correlates grade 8 science to IPC. Some correlation can be made between grade 6 science and IPC.

Supporting Standards from grade 6 and 7 must be reviewed before the grade 8 STAAR science test:

Grade 6: 9 supporting standards

Grade 7: 14 supporting standards

There are 15 student expectations in IPC that are not addressed in grade 8 science (however some are addressed in grade 6). There are 5 student expectations in IPC that are only partially addressed in grade 8 science.

Teacher Certifications for IPC:

- Junior High School (Grades 9-10 only), High School, Secondary, Grades 6-12, or Grades 9-12):
 - Physics
 - Science
 - Science, Composite
- Master Science Teacher (Grades 8-12)
- Mathematics/Physical Science/Engineering
 - Grades 6-12
 - Grades 8-12
- Physical science:
 - Grades 6-12
 - Grades 8-12
- Physics/Mathematics:
 - Grades 7-12
 - Grades 8-12
- Science
 - Grades 7-12
 - Grades 8-12