

§112.20. Science, Grade 8, Beginning with School Year 2010-2011.

	IPC Student Text	IPC Practice Book	IPC TE
(b) Knowledge and skills.			Activities/Projects
(1) Scientific investigation and reasoning. The student, for at least 40% of instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices. The student is expected to:			
(A) demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards; and	11, 18, 42, 72, 144, 152, 175	11, 175	CH4, CH7, CH9, CH12, CH14, CH15, CH17, CH18, CH23, CH24, CH25, CH28, CH31, CH32
(B) practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials.	78, 176, 183, 184, 185, 186	78, 183, 184, 185, 186	CH1, CH2, CH3, CH4, CH5, CH6, CH7, CH8, CH9, CH10, CH11, CH12, CH13, CH14, CH15, CH16, CH17, CH18, CH19, CH20, CH21, CH22, CH23, CH24, CH25,
(2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:			
(A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;	6, 8, 11, 109, 152	6, 8, 11, 152, 154	CH12, CH14, CH15, CH17, CH19, CH28

(B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;	11, 72, 128, 142, 152	11	CH12, CH14, CH15, CH19, CH28
(C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;	153, 154, 155	153, 154, 155	CH11, CH12, CH18
(D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and	11, 152	11, 152	CH19
(E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	11, 112, 117, 122, 123, 124	11, 117, 122, 125	CH14, CH15
(3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:			

(A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;	11, 42, 73, 111, 112, 119, 123, 124, 172	11, 111, 122, 169, 172	CH2
(B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;	17, 19, 20–25, 27–31, 33, 34, 35, 36, 37, 45–47, 56, 57, 61, 66, 67, 69, 73, 74, 80, 83, 88, 89, 93, 95, 105–107, 109, 115, 118, 120, 123, 126–132, 135–139, 142, 143, 145,	1, 5, 7, 8, 9, 12, 18, , 20, 21, 23, 27–32, 35, 36, 37, 42, 45–48, 52–55, 61, 65, 67, 68, 74, 75, 88, 91, 92, 94, 95, 96, 97, 99, 102–112, 116, 118–120, 122, 123,	CH2, CH3, CH4, CH5
(C) identify advantages and limitations of models such as size, scale, properties, and materials; and	10, 29, 33, 59, 73, 74, 88, 91, 118, 152, 155	10, 29, 30, 31, 32, 59, 88, 91	CH2
(D) relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.	4 ,13, 287, 38, 39, 56, 107	27, 38, 39, 56, 107	CH1, CH3
(4) Scientific investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. The student is expected to:			

(A) use appropriate tools to collect, record, and analyze information, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrosopes, timing devices, and other	11, 18, 59, 118, 152, 154, 155, 162	11, 29-32, 45, 46-48, 59, 60, 93, 94, 121-123, 129, 134, 137, 143, 145, 152, 154	CH2, CH4, CH12
(B) use preventative safety equipment, including chemical splash goggles, aprons, and gloves, and be prepared to use emergency safety equipment, including an eye/face wash, a fire blanket, and a fire extinguisher.	11, 18, 72, 128, 152	11, 72, 128, 152	CH14, CH15, CH17
(5) Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. 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;	23, 24, 25, 34-36, 46, 51	23, 24, 25, 35-36, 46, 47	CH5
(B) identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;	25, 26, 46	25, 26, 46	CH5

(C) interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements;	27, 29, 29, 30, 31, 33, 34, 35	27, 28, 29, 30, 31, 32, 33, 34, 35	CH6
(D) recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts;	52, 82, 83, 85	82, 83, 85	CH16
(E) investigate how evidence of chemical reactions indicate that new substances with different properties are formed; and	67, 84, 85, 86, 87	84, 85, 86	CH16, CH17
(F) recognize whether a chemical equation containing coefficients is balanced or not and how that relates to the law of conservation of mass.	82, 83, 85	82, 83, 85	
(6) Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. The student is expected to:			

(A) demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion;	97, 98, 100, 101, 102, 103, 104	97, 98, 100, 101, 102, 103, 104	CH22, CH23, CH24
(B) differentiate between speed, velocity, and acceleration; and	96, 97, 100	96, 97, 100	CH19, CH23
(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 park rides, Earth's tectonic activities, and rocket launches.	107, 110, 111, 112, 113	107, 111, 112, 113	CH19, CH23
(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;			

<p>(B) demonstrate and predict the sequence of events in the lunar cycle; and</p>			
<p>(C) relate the position of the Moon and Sun to their effect on ocean tides.</p>			
<p>(8) Earth and space. The student knows characteristics of the universe. The student is expected to:</p>			
<p>(A) describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification;</p>	15	15	
<p>(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;</p>			

(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;	127, 128, 129, 141	127, 128, 129, 131, 132, 141	CH19, CH27, CH28
(D) model and describe how light years are used to measure distances and sizes in the universe; and	141	141	
(E) research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.			
(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;	105-109	105-109	

(B) relate plate tectonics to the formation of crustal features; and	105-109	105-109	CH21
(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.			
(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;	144	144	
(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and			

(C) identify the role of the oceans in the formation of weather systems such as hurricanes.			
(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;			
(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;	78	78	
(C) explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and	78	78	

(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.	78	78	
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