

## Alignment to Texas Essential Knowledge and Skills

### Making Sense of Sensors

Lesson focuses on how sensors are used in many applications to gather information about our environment. This lesson focuses on the hygrometer, a sensor used to measure humidity. Through this lesson, students work in teams to design and build a hygrometer out of everyday items to measure humidity levels. The student hygrometers are not meant to be exact, but are expected to indicate a change. Students select from everyday items to build their hygrometer, test their machine using a spray bottle to increase humidity, evaluate the effectiveness of their system and those of other teams, and present their findings to the class.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	IPC	Chemistry
<b>Strand: Scientific Investigation and Reasoning</b>							
1.A Demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations including observing a schoolyard habitat.	1.A Demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations.	1.A Demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations.	1.A Demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards.	1.A Demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards.	1.A Demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards.	1.A Demonstrate safe practices during laboratory and field investigations.	1.A Demonstrate safe practices during laboratory and field investigations.
1.B Make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics.	1.B Make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans and plastic.	1.B Make informed choices in the conservation, disposal, and recycling of materials.	1.B Practice appropriate use and conservation of resources including disposal, reuse, or recycling of materials.	1.B Practice appropriate use and conservation of resources including disposal, reuse, or recycling of materials.	1.B Practice appropriate use and conservation of resources including disposal, reuse, or recycling of materials.	1.B Demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.	1.C Demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.
2.A Plan and implement descriptive investigations including asking and answering questions, making inferences, and selecting and using equipment or technology needed to solve a specific problem in the natural world.	2.A Plan and implement descriptive investigations, including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.	2.A Describe, plan and implement simple experimental investigations testing one variable.	2.A Plan and implement comparative and descriptive investigations by making observations, asking well- defined questions, and using appropriate equipment and technology.	2.A Plan and implement comparative and descriptive investigations by making observations, asking well- defined questions and using appropriate equipment and technology.	2.A Plan and implement comparative and descriptive investigations by making observations, asking well- defined questions, and selecting and using appropriate equipment and technology.	2.B Plan and implement investigate procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology.	2.E Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology; including graphing calculators, computers and probes, sufficient scientific glassware such as beakers, Erlenmeyer flasks, pipettes, graduated

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							cylinders, volumetric flasks, safety goggles, burettes, electronic balances and an adequate supply of consumable chemicals.
		2.B Ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.	2.B Design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology.	2.B Design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology.	2.B Design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and selecting and using appropriate equipment and technology.		
2.B Collect data by observing and measuring using the metric system and recognize differences between observed and measured data.	2.B Collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals, such as labeled drawings, writing, and concept maps.	2.C Collect information by detailed observations and accurate measuring.	2.C Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	2.C Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	2.C Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	2.C Collect data and make measurements with precision.	2.F Collect data and make measurements with accuracy and precision.
2.C Construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data.	2.C Construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data.	2.G Construct appropriate simple graphs, tables, maps, and charts using technology including computers to organize, examine, and evaluate information.	2.D Construct tables, using repeated trials and means to organize data and identify patterns.	2.D Construct tables and graphs, using repeated trials and means to organize data and identify patterns.	2.D Construct tables and graphs, using repeated trials and means, to organize data and identify patterns.		
2.D Analyze and interpret patterns in data to construct	2.D Analyze data and interpret patterns to	2.D Analyze and interpret information to	2.E Analyze data to formulate reasonable explanations,	2.E Analyze data to formulate reasonable explanations,	2.E Analyze data to formulate reasonable explanations,	2.D Organize, analyze, evaluate, make inferences,	2.H Organize, analyze, evaluate, make inferences,



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reasonable explanations based on evidence from investigations.	construct reasonable explanations from data that can be observed and measured.	construct reasonable explanations from direct (observable) and indirect (inferred) evidence.	communicate valid conclusions supported by the data, and predict trends.	communicate valid conclusions supported by the data, and predict trends.	communicate valid conclusions supported by the data, and predict trends.	and predict trends from data.	and predict trends from data.
2.F Communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion.	2.F Communicate valid, oral and written results supported by data.	2.F Communicate valid conclusions in both written and verbal forms.				2.E Communicate valid conclusions.	2.I Communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports and technology-based reports.
		3.C Draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works.	3.B Use models to represent aspects of the natural world such as a model of Earth's layers.	3.B Use models to represent aspects of the natural world such as human body systems, and plant and animal cells.	3.B Use models to represent aspects of the natural world such as an atom, a molecule, space or a geologic feature.		
3.D Connect grade level appropriate science concepts with the history of science, science careers and contributions of scientists.	3.D Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.	3.D Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.	3.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.	3.D Relate the impact of research on scientific thought and society, including history of science and contributions of scientists as related to the content.	3.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.	3.D Evaluate the impact of research on scientific thought, society, and the environment.	3.D Evaluate the impact of research on scientific thought, society, and the environment.
						3.E Describe connections between physics and chemistry and future careers.	3.F Research and describe the history of chemistry and contributions of scientists.
<b>Strand: Matter and Energy</b>							
5.A Measure, test, and record physical properties of matter including temperature, mass, magnetism, and the ability to sink or float.	5.A Measure, compare, and contrast physical properties of matter including size, mass, volume, states (solid, liquid,	5.A Classify matter based on physical properties including: mass, magnetism, physical state (solid, liquid, and				6.A Examine differences in physical properties of solids, liquids and gases as explained by the arrangement and motion of	4.C Compare solids, liquids, and gases in terms of compressibility, structure, shape, and volume.

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	gas), temperature, magnetism, and the ability to sink or float.	gas), relative density (sinking and floating), and solubility in water, and the ability to conduct or insulate thermal energy or electric energy.				atoms, ions or molecules of the substances and the strength of the forces of attraction between those particles.	
5.B Describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container.	5.B Predict the changes caused by heating and cooling, such as ice becoming liquid water and condensation forming on the outside of a glass of ice water	5.B Identify the boiling and freezing/melting points of water on the Celsius scale.				6.C Analyze physical and chemical properties of elements and compounds such as, color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity.	10.A Describe the unique role of water in chemical and biological systems.
5.C Predict, observe and record changes in the state of matter caused by heating or cooling.						7.A Investigate changes of state as it relates to the arrangement of particles of matter and energy transfer.	
<b>Strand: Force, Motion and Energy</b>							
6.C Observe forces such as magnetism and gravity acting on objects.	6.D Design an experiment to test the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.	6.D Design an experiment that tests the effect of force on an object.	8.B Identify and describe the changes in position, direction, and speed of an object when acted upon by unbalanced forces.			4.A Describe and calculate an object's motion in terms of position, displacement, speed and acceleration.	
			8.D Measure and graph changes in motion.				
<b>Strand: Earth and Space Science</b>							
8.A Observe, measure, record and compare day-to-day weather changes in different locations at the same time that include air temperature, wind	8.A Measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key.	8.B Explain how the Sun and the ocean interact in the water cycle.					



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direction and precipitation.	8.B Describe and illustrate the continuous movement of water above and on the surface of the Earth through the water cycle, and explain the role of the Sun as a major source of energy in this process.						