

Alignment to Texas Essential Knowledge and Skills

Classroom Paper Recycling

Lesson focuses on how engineers and others have developed and improved the manufacturing of recycled paper. Students work in teams to recycle and manufacture their own recycled paper while learning how recycled paper is manufactured on a larger scale in paper facilities. Student teams evaluate current processes for creating paper and develop improvement to the procedure.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	IPC	Physics
Strand: Scientific Investigation and Reasoning							
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.B 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.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 Plan and implement investigate procedures including asking questions, formulating testable hypotheses, and selecting equipment and technology.	2.E Design and implement investigative procedures including making observations, asking well-defined questions, formulating testable hypotheses, identifying variables, selecting appropriate equipment and technology, and evaluating numerical answers for reasonableness.
2.B Collect data by observing and measuring using the	2.B Collect and record data by observing and	2.C Collect information by detailed	2.C Collect and record data using the International System	2.C Collect and record data using the International System	2.C Collect and record data using the International System	2.C Collect data and make measurements with	2.H Make measurements with accuracy and

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metric system and recognize differences between observed and measured data.	measuring, using the metric system, and using descriptive words and numerals, such as labeled drawings, writing, and concept maps.	observations and accurate measuring.	of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.	precision.	precision and record data using scientific notation and International System (SI) units.
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.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 reasonable explanations based on evidence from investigations.	2.D Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.	2.D Analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence.	2.E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	2.E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	2.E Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.	2.D Organize, analyze, evaluate, make inferences, and predict trends from data.	2.J Organize and evaluate data and make inferences from data including the use of tables, charts, and graphs.
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.K Communicate valid conclusions supported by the data through various methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.
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 Explain the impacts of the scientific contributions of a variety of historical and contemporary scientists on scientific thought and society.

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Strand: Matter and Energy							
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, gas), temperature, magnetism, and the ability to sink or float.	5.A Classify matter based on physical properties including: mass, magnetism, physical state, relative density (sinking and floating), and solubility in water, and the ability to conduct or insulate thermal energy or electric energy.				6.C Analyze physical and chemical properties of elements and compounds such as, color, density, viscosity, buoyancy, boiling point, freezing point, conductivity, and reactivity.	
	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.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.	
5.D Explore and recognize that a mixture is created when two materials are combined, such as gravel and sand and metal and plastic paper clips.	5.C Compare and contrast a variety of mixtures and solutions such as rocks in sand, sand in water, or sugar in water.		5.D Identify the formation of a new substance by using the evidence of a possible chemical change such as production of a gas, change in temperature, production of a precipitate, or color change.			7.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	
						7.F Research and describe the environmental and economic impact of the end-products of chemical reactions such as those that	

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						may result in acid rain, degradation of water and air quality, and ozone depletion.	
Strand: Force, Motion and Energy							
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.					4.D Calculate the effect of forces on objects including the law of inertia, the relationship between force and acceleration, and the nature of force pairs between objects.
6.C Observe forces such as magnetism and gravity acting on objects.							
Strand: Earth and Space							
7.D Explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture, and how resources may be conserved.	7.C Identify and classify the Earth's renewable resources including air, plants, water, and animals, and nonrenewable resources including coal, oil, natural gas; and the importance of conservation.						