

CRM 1 Inquiry

Pacing

- 14 days
- Aug. 27-Sept. 14
- Weeks 1-3

DESIRED RESULTS

Making Meaning

The study of elementary science is multifaceted and requires a variety of student experiences to build understanding of the nature of science including the following:

- Understanding the nature and development of scientific knowledge.
- Participating safely and productively in scientific inquiry and discourse in lab and field experiences at varying degrees of independence.
- Knowing, using and interpreting scientific explanations of the natural world.
- Using scientific observations and tools to collect data to generate and evaluate evidence and explanations.

Transfer: Scientific literacy is established in learning to conduct an investigation and collect evidence from a variety of sources, develop an explanation from the data, and communicate and defend conclusions.

Enduring Understandings:

- Scientists raise questions about the world around them and seek answers by careful observation and investigation.
- Scientists give reasons (evidence) for their claims and conclusions and consider reasons suggested by others.
- Scientists keep a notebook as a thinking tool and use questions, diagrams, charts, graphs, conclusions, and wonderings to record and share their thinking.
- Scientists use tools and safety measures to investigate the natural world.

Essential Questions:

- How do we raise questions and seek answers about the world around us?
- How do we record and share our observations, thinking, and conclusions in science?
- What tools and safety measures do scientists use to investigate the natural world?

Essential Vocabulary

- accuracy/ precisión
- analyze / analizar
- beaker / vaso de precipitado
- calculator/ calculadora
- cameras / cámara
- charts / gráfico
- compare / comparar
- compass / brújula
- conclusion /conclusion
- container / contenedor
- data / datos
- evidence / evidencia
- experiment /experiment
- flow / fluir
- gloves / guantes
- graduated cylinder / cilindro graduado
- hot plate/ plato caliente
- hypothesis/hipótesis
- inference / inferencia

- investigate / investigar
- limitation /limitación
- map / mapa
- measure / medida
- microscope/ microscopio
- models / modelo
- property/ propiedad
- question/ pregunta
- reasonable/razonable
- reliable / confiable
- represent / representar
- results/resultado
- selecting / seleccionando
- spring scale / bascule de resorte
- stopwatch / cronómetro
- thermometer/termómetro
- triple beam balance/ balanza de los tres braza
- valid / válido
- variables /variables

Supporting Vocabulary Link

- [Elementary School Supporting Vocabulary](#)

Student Prerequisite Knowledge

Students should know:

- there is more than one way to answer a question.
- there are different types of investigations (comparative, descriptive, and experimental).
- only one variable can be tested at a time.
- evidence supports conclusions.
- scientific vocabulary is necessary to communicate findings and results.
- scientific thought is refined as technology increases our ability to observe and record more precise data.
- different tools help gather data about properties in order to compare, evaluate and classify matter.
- how, why, and when to use safety equipment appropriately.

Resources: AISD Module Kit, Model Lesson Portfolio, [STEMscopes](#), eBooks: Envisions Science Leveled Readers, Scott Foresman Text, [Science Notebook Resources](#)

ELPS: Mandated by Texas Administrative Code (19 TAC §74.4), click on the link for [English Language Proficiency Standards \(ELPS\)](#) to support English Language Learners.

TEKS Knowledge & Skills	Acquisition	
STAAR: RC = Reporting Category; DC = Dual Coded Skills; Readiness Standard ; Supporting Standard Concepts are addressed in another unit.	Students Will Know	Students Will Be Able To
4.1: Scientific investigation and reasoning. The student conducts classroom and outdoor investigations, following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:		
4.1A: demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations;	<ul style="list-style-type: none"> • Know safety rules, procedures, and proper attire for safety. 	<ul style="list-style-type: none"> • Follow classroom, lab, and outdoor safety procedures.
4.1B: demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations;	<ul style="list-style-type: none"> • Know appropriate procedures for disposal, recycling, and conservation of materials. 	<ul style="list-style-type: none"> • Dispose of or recycled materials in their daily life.
4.2: Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:		
4.2A: 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;	<ul style="list-style-type: none"> • Know how scientists answer their questions. • Know how to write a testable question. 	<ul style="list-style-type: none"> • Be able to formulate a testable question with one variable.
4.2B: 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; and concept maps;	<ul style="list-style-type: none"> • Know what tools and technology are appropriate for different investigations. 	<ul style="list-style-type: none"> • Use tools to collect accurate information. • Measure accurately.

4.2C: construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data;	<ul style="list-style-type: none"> • Graphs, charts, maps and tables are used to communicate differently. 	<ul style="list-style-type: none"> • Construct graphs, tables, charts, both manually and using technology.
4.2D: analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured;	<ul style="list-style-type: none"> • Explanations are justified by evidence. • Know the difference between direct and inferred evidence. 	<ul style="list-style-type: none"> • Analyze data (direct and indirect) and draw valid conclusions from the data.
4.2E: perform repeated investigations to increase the reliability of results;	<ul style="list-style-type: none"> • Reliability increases when investigations are repeated. 	<ul style="list-style-type: none"> • Repeat an investigation and gather more accurate data and more reliable results.
4.2F: communicate valid, oral, and written results supported by data.	<ul style="list-style-type: none"> • Know how to think, observe, communicate, and share data and findings like a scientist. • Science uses mathematics to represent patterns and data. 	<ul style="list-style-type: none"> • Communicate conclusions in a science notebook, lab reports, and share them orally with the class.
4.3: Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:		
4.3A: 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;	<ul style="list-style-type: none"> • Know the difference between a descriptive investigation and an experiment. 	<ul style="list-style-type: none"> • Evaluate scientific explanations to compare with evidence and conclusions.
4.3B: draw inferences and evaluate accuracy of services and product claims found in advertisements and labels such as for toys, food, and sunscreen;	<ul style="list-style-type: none"> • Know the need to evaluate the accuracy of promotional materials because some claims are made that are not based on scientific data. 	<ul style="list-style-type: none"> • Evaluate the validity of promotional claims.
4.3C: represent the natural world using models such as rivers, stream tables, or fossils and identify their limitations, including accuracy and size;	<ul style="list-style-type: none"> • Know the limitations of a model. • Scientists use models to understand things that are too large or far away to test. 	<ul style="list-style-type: none"> • Draw or develop a model that represents how something works or looks.
4.3D: connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.	<ul style="list-style-type: none"> • Science now connects with science in the past. • Scientists use technology and new data to refine their thinking. 	<ul style="list-style-type: none"> • Research scientists and understand their connection, contributions, and relevancy in the real world.

4.4 Scientific investigation and reasoning. The student knows how to use a variety of tools, materials, equipment, and models to conduct science inquiry. The student is expected to:		
<p>4.4A: collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, mirrors, spring scales, pan balances, triple beam balances, graduated cylinders, beakers, hot plates, meter sticks, compasses, magnets, collecting nets, and notebooks; timing devices, including clocks and stopwatches; and materials to support observation of habitats of organisms such as terrariums and aquariums;</p>	<ul style="list-style-type: none"> • Know the function and use of tools in science is to collect data and observations. • The units of measurement in science are in metrics. • Different tools measure different properties. • Analyzing the data gathered using tools gives us information we could not gather without tools. 	<ul style="list-style-type: none"> • Use tools including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, pan balances, triple beam balances, graduated cylinders, beakers, hot plates, meter sticks, timing devices including clocks and stopwatches, notebooks and materials to support observations.
<p>4.4B: use safety equipment as appropriate, including safety goggles and gloves.</p>	<ul style="list-style-type: none"> • Know how, why, and when to use safety equipment appropriately. 	<ul style="list-style-type: none"> • Wear appropriate safety equipment during investigations.

ASSESSMENT EVIDENCE	
Student Work Products/Assessment Evidence	
Performance Tasks	Other Evidence (i.e. unit tests, open ended exams, quiz, essay, student work samples, observations, etc.)
<ul style="list-style-type: none"> • Drawings of scientists/Descriptions of their work • Scientist Oral Report • Distinguish a testable question from other questions, a scientific question from a nonscientific question, and refine questions for investigation. • Skittles Inquiry labs • Data collection and analysis • Full Inquiry Investigation 	<p>Short Cycle Assessment</p> <ul style="list-style-type: none"> • <i>SCA Testing Window: September 17-21</i> • <i>Tested TEKS: 4.1, 4.2, 4.3, 4.4</i> <p>Additional Suggestions for Assessment</p> <ul style="list-style-type: none"> • Teacher observations, questioning, and evaluation of science notebook. • Use of safety rules and equipment • Teacher observations: management and use of tools • Tools foldable/web for science notebook • Students' use of evidence to support explanations and claims. • Note features, patterns, and discrepancies in thinking and data and ask question about them. • Solve problems and/or design a process to find out more information in order to solve the problem. • Self and peer evaluation of full inquiry Investigation.
LESSON PLANNING TOOLS	
<p>In the course of lesson planning, it is the expectation that teachers will include whole child considerations when planning such as differentiation, special education, English language learning, dual language, gifted and talented, social emotional learning, physical activity, and wellness.</p>	
<p>Model Lesson- Inquiry</p> <ul style="list-style-type: none"> • Scientists on Parade! • Tools, Journals, Safety, and Scientists through the Ages! • Scientists in Society • Skittle-tastic • The Big Melting Pot? • Vanishing Colors • Walk the Line • It's Getting Hot in Here <p>Suggested Pacing: (14 days) TEKS: 5.1, 5.2, 5.3, 5.4</p>	