CRM 1 Inquiry	**Pacing** • **9 days** • **Aug. 27-Sept.7** • **Week 1-2**

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

- absorb / absorbencia
- accuracy/ precisión
- analyze / analizar
- beaker / vaso de precipitado
- conclusion /conclusion
- container / contenedor
- data / datos
- evaluate / evaluar
- evidence / evidencia
- experiment /experiment
- flow / fluir
- gloves / guantes
- goggles/lentes de seguridad
- graduated cylinder / cilindro graduado
- hypothesis/hipótesis
- inference / inferencia investigate / investigar
- limitation /limitatión
- observe / observer
- predict / predecir
- property/ propiedad
- question/ pregunta
- reasonable/razonable
- reliable / confiable
- results/resultado
- stopwatch / cronómetro
- strength / fuerza
- 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: Karen Ostlund, *Putting It All Together Inquiry Unit*, 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**
5.1 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:		
5.1A: demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations.	• Know safety procedures, environmentally appropriate and ethical practices.	• Practice safety.
5.1B: make informed choices in the conservation, disposal, and recycling of materials.	• Know appropriate procedures for disposal, recycling, and conservation of materials.	• Make informed decisions in the use of materials.
5.2 Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:		
5.2A: describe, plan, and implement simple experimental investigations testing one variable.	• Only one variable can be tested at a time. • There are different types of investigations (comparative, descriptive, and experimental).	• Describe, plan, and implement investigations.
5.2B: ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.	• There is more than one way to answer a question. • A hypothesis contains an if/then statement.	• Ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology.
5.2C: collect information by detailed observations and accurate measuring. DC	• Different tools measure different properties of matter. • Attention to scale and accurate measurement is needed when making observations.	• Practice accurate reading of scale on tools. • Use tools to collect accurate information.

5.2D: analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence. DC	• Explanations are justified by evidence. • Know the difference between direct and inferred evidence.	• Analyze and interpret information. • Construct reasonable explanations from direct (observable) and indirect (inferred) evidence.
5.2E: demonstrate that repeated investigations may increase the reliability of results. DC	• Reliability increases when investigations are repeated.	• Repeat investigations to gain reliability.
5.2F: communicate valid conclusions in both written and verbal forms. DC	• Evidence supports conclusions. • Scientific vocabulary is necessary to communicate findings and results.	• Communicate valid conclusions using scientific vocabulary orally and in writing.
5.2G: construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information. DC	• Graphs, charts, maps and tables are used to communicate differently. • Graphs have axes and show patterns in data. • Tables contain rows and columns and are used to organize data for easy analysis.	• Represent scientific information using graphs, charts, maps and tables with and without technology. • Analyze graphic information to evaluate data and draw conclusions.
5.3 The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:		
5.3A: 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.	• Empirical evidence, logical reasoning, and testing are used to critique scientific explanations.	• Analyze, evaluate, and critique scientific explanations. • Examine all sides of scientific evidence of scientific explanations.
5.3B: evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels. DC	• Know the need to evaluate the accuracy of promotional materials because some claims are made that are not based on scientific data.	• Evaluate the validity of promotional claims.
5.3C: draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works. DC	• Know the limitations of a model.	• draw or develop a model that represents how something works or looks. • Draw to scale.
5.3D: connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists. DC	• Scientific thought is refined as technology increases our ability to observe and record more precise data.	• Connect science concepts to real world discoveries, innovations and careers.

5.4 Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:		
5.4A: collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, pan balances, triple beam balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices, including clocks and stopwatches; and materials to support observations of habitats or organisms such as terrariums and aquariums. DC	• Different tools help gather data about properties in order to compare, evaluate and classify matter. • Tools must be used safely. • Certain tools are used to help keep us safe.	• Identify each tool and know its use. • Accurately read the scale of the tool. • Choose tools accurately for safety. • Use a science notebook as a thinking tool. • Collect, record, and analyze information using tools.
5.4B: use safety equipment, including safety goggles and gloves. DC	• Know how, why, and when to use safety equipment appropriately.	• Use safety equipment appropriately.

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.)**
Putting It All Together Labs: • Directed Inquiry: Absorbency Lab Day 3 Guided Inquiry: Strength Lab Day 4 • Directed Inquiry: Absorbency Lab2 Day 5 • Guided Inquiry: Strength Lab2 Day 6 • Coupled Inquiry: Investigable Questions Day 7 • Full Inquiry: Planning, Conducting, Sharing the Results of an Investigation Day 8-10	**Short Cycle Assessment** • *SCA Testing Window: September 10-14* *Tested TEKS: 5.1, 5.2, 5.3, 5.4* **Additional Suggestions for Assessment** • Teacher observations: Use of safety rules and equipment • Teacher observations: management and use of tools • Tools foldable/web in Interactive Notebook • Students' use of evidence to support explanations and claim.

LESSON PLANNING TOOLS
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.
Model Lesson- *Inquiry* • Working as a Scientist- Descriptive Investigations • Experimental Investigations • Questions/ Planning an Investigation and Sharing Results Suggested Pacing: (9 days) TEKS: 5.1, 5.2, 5.3, 5.4