Colquitt County Science Pacing Guide SY 20-21

GRADE	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May

K	Intro into Engineering Design Process (EDP) -What is a Scientist -What is technology -Intro into journals and how scientist use journals GKIDS Rituals and Routines Community Helper Ideas Night and Day SKE1a,b	Night and Day Living and Non-living Classify Earth Materials (soil, rock, water, and air) Use tools to group rocks by their physical attributes. Night and Day SKE1a,b SKE2a,b,c SKL1a,b	Physical Properties of Matter, Motion SKP1a,b, and c SKP2 SKL1a, b	Living Things Plants and Animals SKL2 SKL1a and b
Standards	**SKE1. Obtain, evaluate, and communicate** observations about time patterns (day to night and night to day) and objects (sun, moon, stars) in the day and night sky. **a. Ask questions** to classify objects according to those seen in the day sky, the night sky, and both. **b. Develop a model** to communicate the changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day using pictures and words. (Clarification statement: Students are not expected to	**SKE1**. **Obtain, evaluate, and communicate** observations about time patterns (day to night and night to day) and objects (sun, moon, stars) in the day and night sky. **a. Ask questions** to classify objects according to those seen in the day sky, the night sky, and both. **b. Develop a model** to communicate the changes that occur in the sky during the day, as day turns into night, during the night, and as night turns into day using pictures and words. (Clarification statement: Students are not expected to	**SKP1**. **Obtain, evaluate, and communicate** information to describe objects in terms of the materials they are made of and their physical attributes. **a. Ask questions** to compare and sort objects made of different materials. (Common materials include clay, cloth, plastic, wood, paper, and metal.) **b. Use senses and science tools** to classify common objects, such as buttons or swatches of cloth, according to their physical attributes (color, size, shape, weight, and texture). **c. Plan and carry out** an	**SKL1**. **Obtain, evaluate, and communicate** information about how organisms (alive and not alive) and non-living objects are grouped. **a**. **Construct an explanation** based on observations to recognize the differences between organisms and nonliving objects. **b. Develop a model** to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes. **SKL2**. **Obtain, evaluate, and communicate** information to compare the

	understand the tilt of the Earth, rotation, or revolution.)	understand the tilt of the Earth, rotation, or revolution.) **SKE2. Obtain, evaluate, and communicate** information to describe the physical attributes of earth materials (soil, rocks, water, and air). **a. Ask questions** to identify and describe earth materials—soil, rocks, water, and air. **b. Construct an argument** supported by evidence for how rocks can be grouped by physical attributes (size, weight, texture, color). **c. Use tools to observe** and record physical attributes of soil such as texture and color **SKL1. Obtain, evaluate, and communicate** information about how organisms (alive and not alive) and non-living objects are grouped. **a. Construct an explanation** based on observations to recognize the differences between organisms and nonliving objects. **b. Develop a model** to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.	investigation to predict and observe whether objects, based on their physical attributes, will sink or float. **SKP2. Obtain, evaluate, and communicate** information to compare and describe different types of motion. **a**. **Plan and carry out** an investigation to determine the relationship between an object's physical attributes and its resulting motion (straight, circular, back and forth, fast and slow, and motionless) when a force is applied. (Examples could include toss, drop, push, and pull.) **b. Construct an argument** as to the best way to move an object based on its physical attributes. **SKL1. Obtain, evaluate, and communicate** information about how organisms (alive and not alive) and non-living objects are grouped. **a. Construct an explanation** based on observations to recognize the differences between organisms and nonliving objects. **b. Develop a model** to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.	similarities and differences in groups of organisms. **a. Construct an argument** supported by evidence for how animals can be grouped according to their features. **b. Construct an argument** supported by evidence for how plants can be grouped according to their features. **c**. **Ask questions and make observations** to identify the similarities and differences of offspring to their parents and to other members of the same species.

Resource Link	https://www.georgiastandards.org/Georgia-Standards/Pages/Science-Kindergarten.aspx SLDS-TRL Tab **GYSTC Supplemental Science Resource Guide Unit 3** **STATES Units** https://lor2.gadoe.org/gadoe/file/3447b786-b33c-42a8-8f29-584ba534ec2b/1/Kindergarten%20Science%20Instructional%20Segment%20Five%20Pacing%20Guide%20Time%20Patterns%20%26%20Organisms.pdf https://lor2.gadoe.org/gadoe/file/d5b03587-7034-4184-a81f-44b132290066/1/Kindergarten-Science-Instructional-Segment-5-Time-Patterns-%26-Organisms-with-supports.pdf GPB https://www.gpb.org/education/learn	https://www.georgiastandards.org/Georgia-Standards/Pages/Science-Kindergarten.aspx SLDS-TRL Tab **GYSTC Supplemental Science Resource Guide Unit 3, 5, 6** **STATE Units** https://lor2.gadoe.org/gadoe/file/3447b786-b33c-42a8-8f29-584ba534ec2b/1/Kindergarten%20Science%20Instructional%20Segment%20Five%20Pacing%20Guide%20Time%20Patterns%20%26%20Organisms.pdf https://lor2.gadoe.org/gadoe/file/d5b03587-7034-4184-a81f-44b132290066/1/Kindergarten-Science-Instructional-Segment-5-Time-Patterns-%26-Organisms-with-supports.pdf https://lor2.gadoe.org/gadoe/file/a3705f97-0281-4ff9-8478-c3a112e071df/1/Science-Kindergarten-Living-Non-Living-Pacing-Guide.pdf https://lor2.gadoe.org/gadoe/file/96290e25-d632-4713-8d2a-8b56c13ef967/1/Kindergarten-Science-Instructional-Segment-3-Living-Non-Living-with-supports.pdf https://lor2.gadoe.org/gadoe/f	https://www.georgiastandards.org/Georgia-Standards/Pages/Science-Kindergarten.aspx SLDS-TRL Tab **GYSTC Supplemental Science Resource Guide Unit 2 & 4** **STATE Units** https://lor2.gadoe.org/gadoe/file/0a47a184-4ebb-40da-b929-228270af20c5/1/Kindergarten%20Science%20Instructional%20Segment%20One%20Pacing%20Guide%20Properties%20of%20Matter%20.pd https://lor2.gadoe.org/gadoe/file/aef75ff3-9f70-4a0a-b09f-0d7fe60cc7ec/1/Kindergarten-Science-Instructional-Segment-1-Properties-of-Matter-with-supports.pdf https://lor2.gadoe.org/gadoe/file/3447b786-b33c-42a8-8f29-584ba534ec2b/1/Kindergarten%20Science%20Instructional%20Segment%20Five%20Pacing%20Guide%20Time%20Patterns%20%26%20Organisms.pdf https://lor2.gadoe.org/gadoe/file/d5b03587-7034-4184-a81f-44b132290066/1/Kindergarten-Science-Instructional-Segment-5-Time-Patterns-%26-	https://www.georgiastandards.org/Georgia-Standards/Pages/Science-Kindergarten.aspx SLDS-TRL Tab **GYSTC Supplemental Science Resource Guide Unit 1 & 7** **STATE Units** https://lor2.gadoe.org/gadoe/file/a3705f97-0281-4ff9-8478-c3a112e071df/1/Science-Kindergarten-Living-Non-Living-Pacing-Guide.pdf https://lor2.gadoe.org/gadoe/file/96290e25-d632-4713-8d2a-8b56c13ef967/1/Kindergarten-Science-Instructional-Segment-3-Living-Non-Living-with-supports.pdf https://lor2.gadoe.org/gadoe/file/3447b786-b33c-42a8-8f29-584ba534ec2b/1/Kindergarten%20Science%20Instructional%20Segment%20Five%20Pacing%20Guide%20Time%20Patterns%20%26%20Organisms.pdf https://lor2.gadoe.org/gadoe/file/d5b03587-7034-4184-a81f-44b132290066/1/Kindergarten-Science-Instructional-Segment-5-Time-Patterns-%26-Organisms-with-supports.pdf

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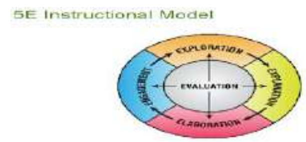
Possible District Approved Field Trips
Virtual field trips are offered with GYSTC

Grade	Trip	Standard
K	Destination Ag	SKL1 and SKL2a

What is STEM

STEM education is an interdisciplinary approach to learning which removes the traditional instructional setting of teaching isolated subjects and integrates science, technology, engineering and math into real world learning experiences for students.

5 E Instructional Model



The 5E instructional model is built on the idea that learners build on and construct new ideas on top of their old ones. Advantages of the 5E model include: Enhancing mastery of subject matter,Developing scientific reasoning, Understanding the complexity and ambiguity of empirical work, Developing practical skills, Understanding the nature of science, Cultivating interest in science and interest in learning science,Developing teamwork abilities.

Engagement	Exploration	Explanation	Extend/Elaboration	Evaluation
Teacher generates interest, assess prior knowledge, connects prior knowledge, sets instructional focus on the concept,	Students experience key concepts, learn new skills, asking question,reflect on their thinking and develop relationships and understanding of concepts	Connecting prior knowledge to new content/discoveries, use of academic language, teacher and students work together	Apply learning to similar situations, explain new situation with formal academic language,	Should be ongoing throughout the learning phase, shows evidence of accomplishment,Teacher, peer and self assessments

Teacher actions: Motivates, creates interest, raises questions, taps into prior knowledge	**Teacher actions:** Moves into a facilitator role, observes students, asks guiding questions, encourages teamwork, provides materials and resources, provide adequate time for students to engage with the materials	**Teacher actions:** Encourages students to explain understandings in their own words, provides explanations of definitions, laws, theories, ask clarifying questions, builds onto students understanding, provide a variety of instructional strategies, develop academic language, formative assessments to gauge understanding	**Teacher actions:** Provide an opportunity for students to apply their new gained information to enhance additional learning, remind students to look for alternative ways to solve the problem,providing guidance on perseverance	**Teacher actions:** Observes students, asks open-ended questions,assess students, encourages students to self assess
Student actions: Ask questions, attentive to teacher/classmates, makes connections to prior learning, self reflects on what they already know, what do they want to know	**Student actions:** Conducts experiments, activities, work with groups to make meaning of the problem, record observations, use journals, listen to others ideas,	**Student actions:** Explain solutions, critiques or ask further questions of others solutions,refers back to notes and journals to communicate findings and understanding, self assesses their own learning	**Student actions:** Generates interest in new learning, explore related content, records observations and interacts with peers to broaden one's o	**Student actions:** Self evaluates, uses academic language, demonstrates understanding of concept, solves problems
Example: Topic : Observe and describe the process of erosion, transportation, and deposition of the earth's land surface using natural phenomena and models	**Example:** Construct a model to investigate how these changes may have occurred. Provide materials so the students can construct their own model of a landscape. It	**Example:** Tell me what some of your prediction were before it rained on your landscape. (Record on board.) What actually happened to your landscape when it rained on it? (record so	**Example:** Using the same paint roller tray as the base for their landscape, have the groups of students plan a method to decrease or eliminate erosion. Students should draw a	**Example:** Have photographs representing each process and have students identify and explain why they identified it as such.

Materials : paint tray (the kind used for a paint roller), pieces of sod (enough for each group), potting soil, heavy clay like soil, Rainmaker (paper cup with about ten tiny holes poked in the bottom) , Water. Activity 1.bottom of slide under swing 2.end of splash guard by rain spout at entrance to door 3. path leading to the playground at the bottom of hill/slope Do you notice anything different about these areas? (They are just dirt; no grass is growing here.) What do you think caused these changes? (Students walking over them; water running through it)	should include a piece of sod, fine potting soil, and a heavy clay like soil. Have them use a paint roller tray as the base of the landscape. Do not put any landscape materials in the bottom well; it should remain empty. Once students have constructed their models, have them diagram and label their models and make a prediction as to what will happen if it "rains" on their landscape. One student pours a cup of water all at once into the rainmaker. Hold the rainmaker about 4 inches above the upper end of the landscape and slowly move it back and forth so the water "rains" down on the model landscape. Observe what happens to the landscape. When it is finished raining the students observe the final effects of the rain on their landscape. Have students go back to their predictions and record what actually happened.	you can make comparisons.) How is your landscape different after the rain than before it rained on it? What happened to the soil? Where did it go? Why did this happen? As students share their ideas and understandings, record key phrases on the board. Some phases that may be valuable to your later discussion may include:dirt and soil washed away,the soil collected at the bottom of the slope,the water hollowed out the soil, the rain carried the soil down the hill,when the water washed away the soil it formed a hole Relate their observations to the processes scientists observe over an extended period of time. Use student models to identify and label erosion and deposition. Have students work to create definitions for these terms. When you are sure students have a real understanding of the terms, formulate a final definition and post on board or chart in the	diagram of the model planned and label the materials used in their landscape. They should write a short explanation explaining why they think this will work to curb erosion. (Tell students that you will provide the same materials that they used today and they are responsible for supplying the rest of the materials to build their new landscape tomorrow.) Have students use a variety of resources and references to research various landmarks that are the result of these processes.	Have students take a walk in their own neighborhood tonight to find examples of each process. They should draw and write one sentence telling what they observed. Have students write their own definition and list an example for each process in their science journals.

		classroom for future reference. Demonstrate the process of transportation and lead students to understand that it is the movement of soil particles from one place to another. Refer to the list generated during the engagement and have students make connections; they should use the new terms to discuss and explain what they saw. Help them to understand that they just used water to simulate erosion, transportation, and deposition, but it can also be caused by wind, people, animals, etc.		

Science and Engineering Practices

Asking questions and defining problems	Developing and using models
A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world(s) works and which can be empirically tested. Engineering questions clarify problems to determine criteria for successful solutions and identify constraints to solve problems about the designed world. Both scientists and engineers also ask questions to clarify ideas.	A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations. Modeling tools are used to develop questions, predictions and explanations; analyze and identify flaws in systems; and communicate ideas. Models are used to build and revise scientific explanations and proposed

	engineered systems. Measurements and observations are used to revise models and designs.
Planning and carrying out investigations	Using mathematics and computational thinking
Scientists and engineers plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables or parameters. Engineering investigations identify the effectiveness, efficiency, and durability of designs under different conditions	In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; solving equations exactly or approximately; and recognizing, expressing, and applying quantitative relationships. Mathematical and computational approaches enable scientists and engineers to predict the behavior of systems and test the validity of such predictions.
Analyzing and interpreting data	Constructing explanations and designing solutions
Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data. Scientists identify sources of error in the investigations and calculate the degree of certainty in the results. Modern technology makes the collection of large data sets much easier, providing secondary sources for analysis. Engineering investigations include analysis of data collected in the tests of designs. This allows comparison of different solutions and determines how well each meets specific design criteria— that is, which design best solves the problem within given constraints. Like scientists, engineers require a range of tools to identify patterns within data and interpret the results. Advances in science make analysis of proposed solutions more efficient and effective.	The end-products of science are explanations and the end-products of engineering are solutions. The goal of science is the construction of theories that provide explanatory accounts of the world. A theory becomes accepted when it has multiple lines of empirical evidence and greater explanatory power of phenomena than previous theories. The goal of engineering design is to find a systematic solution to problems that is based on scientific knowledge and models of the material world. Each proposed solution results from a process of balancing competing criteria of desired functions, technical feasibility, cost, safety, aesthetics, and compliance with legal requirements. The optimal choice depends on how well the proposed solutions meet criteria and constraints.
Engaging in argument from evidence	Obtaining, evaluating, and communicating information
Argumentation is the process by which evidence-based conclusions and solutions are reached. In science and engineering, reasoning and argument based on evidence are essential to identifying the best explanation for a natural phenomenon or the best solution to a design	Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be

problem. Scientists and engineers use argumentation to listen to, compare, and evaluate competing ideas and methods based on merits. Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to evaluate claims	done in multiple ways: using tables, diagrams, graphs, models, and equations as well as orally, in writing, and through extended discussions. Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs