

Elementary Science Lesson Plan

Objective	The students will make their own hand held wind turbine.
TEKS	<p>§112.11. Science, Kindergarten, Adopted 2017.</p> <p>(a) Introduction.</p> <p>(2) Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process."</p> <p>(3) Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.</p> <p>(b) Knowledge and skills.</p> <p>(9) Organisms and environments. The student knows that plants and animals have basic needs and depend on the living and nonliving things around them for survival. The student is expected to:</p> <p>(A) differentiate between living and nonliving things based upon whether they have basic needs and produce offspring; and</p> <p>(B) examine evidence that living organisms have basic needs such as food, water, and shelter for animals and air, water, nutrients, sunlight, and space for plants.</p> <p>§112.12. Science, Grade 1, Adopted 2017.</p> <p>(a) Introduction.</p> <p>(1) In Grade 1, students observe and describe the natural world using their five senses. Students do science as inquiry in order to develop and enrich their abilities to understand the world around them in the context of scientific concepts and processes. Students develop vocabulary through their experiences investigating properties of common objects, earth materials, and organisms.</p> <p>(A) A central theme in first grade science is active engagement in asking questions, communicating ideas, and exploring with scientific tools in order to explain scientific concepts and processes like scientific investigation and reasoning; matter and energy; force, motion, and energy; Earth and space; and organisms and environment. Scientific investigation and reasoning involves practicing safe procedures, asking questions about the natural world, and seeking answers to those questions through simple observations and descriptive investigations.</p> <p>(B) Matter is described in terms of its physical properties, including relative size and mass, shape, color, and texture. The importance of light, heat, and sound energy is identified as it relates to the students' everyday life. The location and motion of objects are explored.</p> <p>(b) Knowledge and skills.</p> <p>(7) Earth and space. The student knows that the natural world includes rocks, soil, and water that can be observed in cycles, patterns, and systems. The student is expected to:</p>

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- (A) observe, compare, describe, and sort components of soil by size, texture, and color;
- (B) identify and describe a variety of natural sources of water, including streams, lakes, and oceans; and
- (C) identify how rocks, soil, and water are used to make products.

§112.13. Science, Grade 2, Adopted 2017.

(b) Knowledge and skills.

(1) Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures. The student is expected to:

(B) identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal.

(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:

(A) observe, describe, and compare rocks by size, texture, and color;

(B) identify and compare the properties of natural sources of freshwater and saltwater; and

(C) distinguish between natural and manmade resources.

§112.14. Science, Grade 3, Adopted 2017.

(a) Introduction.

(4) In Grade 3, students learn that the study of science uses appropriate tools and safe practices in planning and implementing investigations, asking and answering questions, collecting data by observing and measuring, and by using models to support scientific inquiry about the natural world.

(A) Within the physical environment, students recognize that patterns, relationships, and cycles exist in matter. Students will investigate the physical properties of matter and will learn that changes occur. They explore mixtures and investigate light, sound, and thermal energy in everyday life. Students manipulate objects by pushing and pulling to demonstrate changes in motion and position.

(B) Within the natural environment, students investigate how the surface of Earth changes and provides resources that humans use. As students explore objects in the sky, they describe how relationships affect patterns and cycles on Earth. Students will construct models to demonstrate Sun, Earth, and Moon system relationships.

(C) Within the living environment, students explore patterns, systems, and cycles within environments by investigating characteristics of organisms, life cycles, and interactions among all components of the natural environment. Students examine how the environment plays a key role in survival. Students know that when changes in the environment occur organisms may thrive, become ill, or perish.

§112.15. Science, Grade 4, Adopted 2017.

(a) Introduction.

(4) The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing

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information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary, in the context of physical, earth, and life sciences.

(b) Knowledge and skills.

(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:

(A) demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations; and

(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.

§112.16. Science, Grade 5, Adopted 2017.

(a) Introduction

(1) In Grade 5, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(A) Within the physical environment, students learn about the physical properties of matter, including magnetism, physical states of matter, relative density, solubility in water, and the ability to conduct or insulate electrical and heat energy. Students explore the uses of light, thermal, electrical, and sound energies.

(b) Knowledge and skills.

(2) Scientific investigation and reasoning. The student uses scientific methods during laboratory and outdoor investigations. The student is expected to:

(A) describe, plan, and implement simple experimental investigations testing one variable;

(B) ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology;

(C) collect information by detailed observations and accurate measuring;

(D) analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence;

(E) demonstrate that repeated investigations may increase the reliability of results;

(F) communicate valid conclusions in both written and verbal forms;

STAAR

Answer:

A

These questions will need to be modified for the grade that will be using them. These were pulled straight from the STAAR test.

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9 Some buildings and homes are heated by energy produced from an alternative to fossil fuels. Which of these is an example of a building or home heated using an alternative energy source?

- A** A home heated by energy generated by a hydroelectric dam
- B** A building that has emergency electric generators that run on gasoline
- C** A home heated by energy produced from a coal power plant in a city
- D** A building that has furnaces powered by natural gas

Answer:

H

14 Which list contains only processes that must occur in order for fossil fuels to form?

- F** Formation of faults, burial, glacier formation
- G** Organism growth, burial, volcanic eruptions
- H** Organism growth, burial, compaction
- J** Erosion, burial, earthquakes

18 A student is asked to design a sleeve for a cup that will insulate thermal energy and not feel hot to the touch when the cup is filled with hot liquid.



The student has four materials to choose from. Which of these materials is least useful as an insulator?

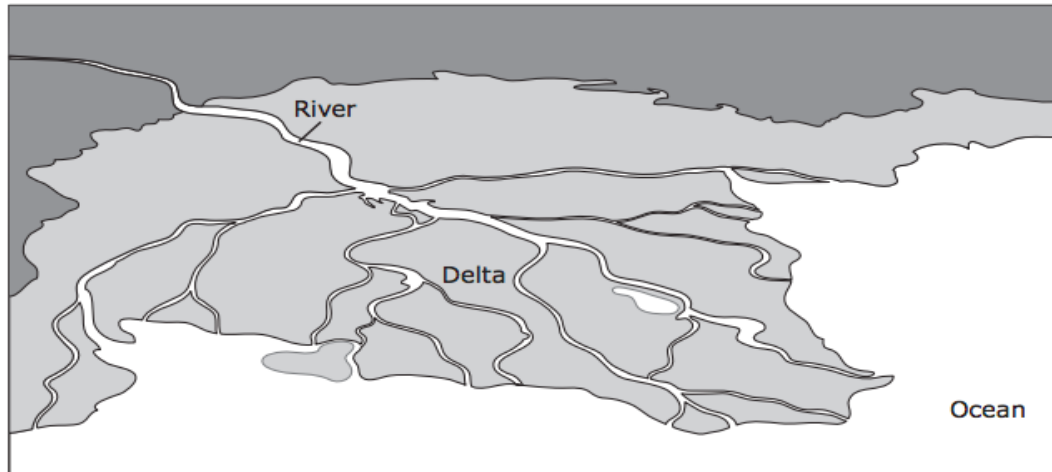
- F** Cardboard
- G** Aluminum
- H** Rubber
- J** Plastic

Answer:

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G

20 The size and shape of a delta can change over time.



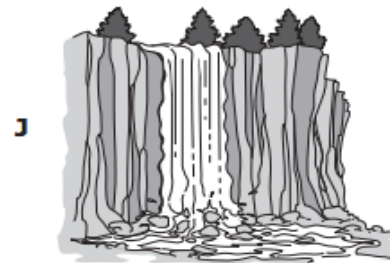
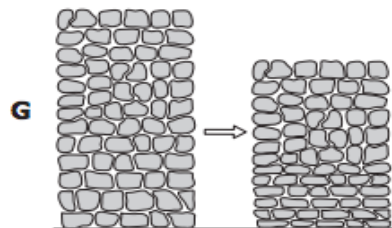
The size and shape of this delta over time are NOT likely to be changed by —

- F** the number and height of tides along the shore
- G** the amount and size of sediments carried by the river and streams
- H** the amount of hunting and fishing in the delta
- J** the number and size of waves from the ocean that reach the shore

Answer:

H

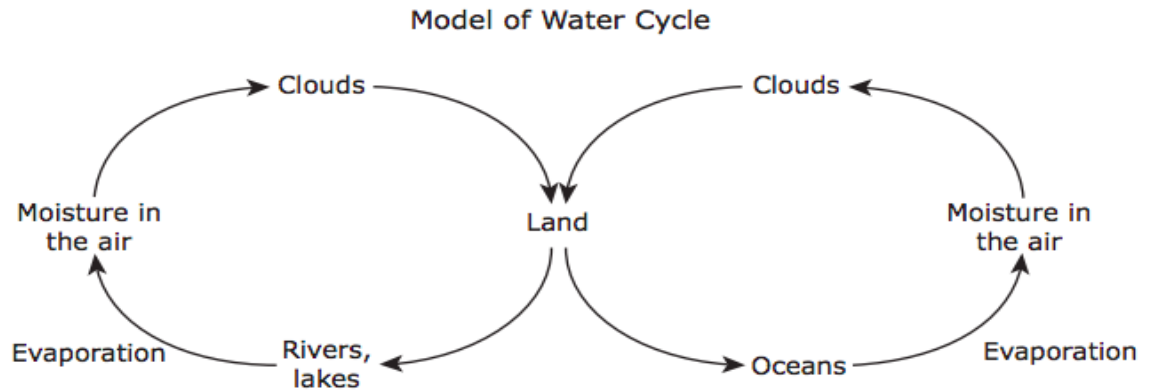
28 Which diagram models the process of compaction leading to the formation of sedimentary rock?



Answer:

G

36 The model below shows where water can be found during different stages of the water cycle.



What should be added to the diagram to better explain the water cycle?

- F** Soil to trap water from runoff
- G** The sun to provide energy for evaporation
- H** Rocks to release thermal energy
- J** Plants to provide oxygen in the atmosphere

Answer:

G

Struggling Learners

- The struggling learners will already have the pinwheel pieces cut out.
- The struggling learners will be able have a buddy for the worksheet.

Advanced Learners

- The advanced learners will create the pinwheel without the written instructions.
- The advanced learners will work on the pinwheel and worksheet independently.

Helpful Links

[Oil and Gas](#) [how to create a pinwheel](#)

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Engage	While students are walking into the classroom have a fan blowing on them. Once everyone is in their seat, ask them if they would like their own fan. Ask the students if they have seen the giant white fans in the fields? If they have, let this discussion move forward with a few students' inputs on the wind turbines.
Explore	Explain to the students what the giant fans are. Explain to the students how the turbines work.
Explain	Based on the earlier question, if the students would like their own fan. Ask if they would like the fan if it did not cool them? Most students will say yes. (hopefully)
Elaborate	Begin the creating process of the wind turbine.
Evaluate	If the students follow instructions to the best of their ability, their true evaluation will be if they finished their wind turbine.