

STAAR CONNECTION™ Developmental Series™

Science
5
teacher



KAMICO®
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STAAR CONNECTION™

Science
5
teacher

Developmental Series™

XXVIII/i/MMXV
Version 1



KAMICO®
Instructional Media, Inc.

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**Texas Essential Knowledge and Skills
Grade 5 Science**

**Reporting Category 1:
Matter and Energy**

The student will demonstrate an understanding of the properties of matter and energy and their interactions.

Grade 5

- (5.5) **Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to
- (A) classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, and gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy; **Readiness Standard**
 - Physical Fitness 15
 - Assessment 21

 - (B) identify the boiling and freezing/melting points of water on the Celsius scale; **Supporting Standard**
 - How's the Temperature? 25
 - Assessment 28

 - (C) demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand; and **Supporting Standard**
 - All Mixed Up 31
 - Assessment 36

 - (D) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water. **Supporting Standard**
 - What's the Solution? 38
 - Assessment 52

Grade 3

(3.5) **Matter and energy.** The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to

(C) predict, observe, and record changes in the state of matter caused by heating or cooling. **Supporting Standard**

What's My State?	55
Assessment	59

Reporting Category 2: Force, Motion, and Energy

The student will demonstrate an understanding of force, motion, and energy and their relationships.

Grade 5

(5.6) **Force, motion, and energy.** The student knows that energy occurs in many forms and can be observed in cycles, patterns, and systems. The student is expected to

(A) explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy; **Readiness Standard**

Energize Your Name!	63
Assessment	64

(B) demonstrate that the flow of electricity in circuits requires a complete path through which an electric current can pass and can produce light, heat and sound; **Readiness Standard**

Electricity Makes It Happen	66
Assessment	78

(C) demonstrate that light travels in a straight line until it strikes an object or travels through one medium to another and demonstrate that light can be reflected such as the use of mirrors or other shiny surfaces and refracted such as the appearance of an object when observed through water; and **Readiness Standard**

Changing Light	82
Assessment	86

(D) design an experiment that tests the effect of force on an object.

Supporting Standard Forced to Change	90
Assessment	96

Grade 3

- (3.6) **Force, motion, and energy.** The student knows that forces cause change and that energy exists in many forms. The student is expected to
- (B) demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons. **Supporting Standard**
- | | |
|-----------------------------|-----|
| Moving Takes Work | 100 |
| Assessment | 108 |

Reporting Category 3: Earth and Space

The student will demonstrate an understanding of components, cycles, patterns, and natural events of Earth and space systems.

Grade 5

- (5.7) **Earth and space.** The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to
- (A) explore the processes that led to the formation of sedimentary rocks and fossil fuels; **Readiness Standard**
- | | |
|----------------------|-----|
| Old Earth | 112 |
| Assessment | 118 |
- (B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice; **Readiness Standard**
- | | |
|-----------------------------|-----|
| Landform Jeopardy | 122 |
| Assessment | 131 |
- (C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels; and **Readiness Standard**
- | | |
|--|-----|
| Alternative Energy in Action | 134 |
| Assessment | 141 |
- (D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models.
- | | |
|--|-----|
| Supporting Standard What Happened Next? | 145 |
| Assessment | 151 |

(5.8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to	
(A) differentiate between weather and climate; Supporting Standard	
How Are They Different?	156
Assessment	159
(B) explain how the Sun and the ocean interact in the water cycle; Supporting Standard	
Interaction Match Game	163
Assessment	175
(C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky; and Readiness Standard	
Follow That Sun!	178
Assessment	183
(D) identify and compare the physical characteristics of the Sun, Earth, and Moon. Supporting Standard	
Calling EMS	186
Assessment	190

Grade 4

(4.7) Earth and space. The student knows that Earth consists of useful resources and its surface is constantly changing. The student is expected to	
(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants; and Supporting Standard	
Getting Soiled	192
Assessment	198
(C) identify and classify Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation. Supporting Standard	
Resourceful Earth	201
Assessment	207

(4.8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to	
(A) measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key;	
Supporting Standard Tomorrow's Weather Forecast Is	210
Assessment	214
(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process; and Supporting Standard	
Moving Water	219
Assessment	227
(C) collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time.	
Supporting Standard Pattern Play	230
Assessment	241

Grade 3

(3.7) Earth and space. The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to	
(B) investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides. Supporting Standard	
Rapidly Changing Earth	245
Assessment	253
(3.8) Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to	
(D) identify the planets in Earth's solar system and their position in relation to the Sun. Supporting Standard	
Planet Puzzle	256
Assessment	258

Reporting Category 4: Organisms and Environments

The student will demonstrate an understanding of the structures and functions of living organisms and their interdependence on each other and on their environment.

Grade 5

- (5.9) **Organisms and environments.** The student knows that there are relationships, systems, and cycles within environments. The student is expected to
- (A) observe the way organisms live and survive in their ecosystem by interacting with the living and non-living elements;
Readiness Standard Lean on Me 261
Assessment 263
 - (B) describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers;
Readiness Standard Flowing Food 266
Assessment 277
 - (C) predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways; and **Supporting Standard**
Before and After 281
Assessment 289
 - (D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals. **Supporting Standard**
Cycling Through Carbon Dioxide
and Oxygen 293
Assessment 298
- (5.10) **Organisms and environments.** The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to
- (A) compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals; **Readiness Standard**
Adapt to Survive 301
Assessment 305

(B) differentiate between inherited traits of plants and animals such as spines on a cactus or shape of a beak and learned behaviors such as an animal learning tricks or a child riding a bicycle; and	
Readiness Standard Inherited or Learned?	309
Assessment	317
(C) describe the differences between complete and incomplete metamorphosis of insects. Supporting Standard	
Morphing Insects	320
Assessment	324

Grade 3

(3.9) Organisms and environments. The student knows that organisms have characteristics that help them survive and can describe patterns, cycles, systems, and relationships within the environments. The student is expected to	
(A) observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem. Supporting Standard	
Ecosystem Life Support	327
Assessment	335
(3.10) Organisms and environments. The student knows that organisms undergo similar life processes and have structures that help them survive within their environments. The student is expected to	
(C) investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs. Supporting Standard	
Life Cycle Rummy	340
Assessment	351

Scientific Investigation and Reasoning Skills

These skills will not be listed under a separate reporting category. Instead, they will be incorporated into at least 40% of the test questions in reporting categories 1-4 and will be identified along with content standards.

Grade 5

- (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
- (A) demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations; and
 - Classroom and Outdoor Investigation Practices 356
 - Assessment 358
 - (B) make informed choices in the conservation, disposal, and recycling of materials.
 - Informed Choices in Resource Management 361
 - Assessment 369
- (5.2) **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; Paper Airplane Engineer 372
 - Assessment 377
 - (B) ask well-defined questions, formulate testable hypotheses, and select and use appropriate equipment and technology;
 - Paper Airplane Preflight Preparation 380
 - Assessment 382
 - (C) collect information by detailed observations and accurate measuring;
 - Paper Airplane Test Pilot 385
 - Assessment 389

(D)	analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence;	Paper Airplane Flight Analysis	393
		Assessment	397
(E)	demonstrate that repeated investigations may increase the reliability of results;	Repeating for Reliable Results	403
		Assessment	410
(F)	communicate valid conclusions in [both] written [and verbal] form[s]; and	Paper Airplane Conclusions and Refinements	414
		Assessment	415
(G)	construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information.	Paper Airplane Graphing for Understanding	420
		Assessment	422
(5.3)	Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to		
(A)	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;	Is That a Fact?	428
		Assessment	443
(B)	evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels;	Do They Expect Me to Buy That?	448
		Assessment	452
(C)	draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works; and	Ant Nest Diorama	457
		Assessment	460
		Flowing Pop	464
		Assessment	469

(D) connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.		
	Science Match-Up	474
	Assessment	487
(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		
(A) 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, and		
	Equipment Check	489
	Assessment	491
(B) use safety equipment, including safety goggles and gloves.		
	Safety Equipment Relay	496
	Assessment	499
Answer Key		502
Student Bubble Answer Sheet		518
Bubble Answer Key		523
Rulers		528
KAMICO® Product Information		529

Reporting Category 3: Earth and Space
TEKS 5.7B

Recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice.

ACTIVITY
Landform Jeopardy

Materials

Pictures and posters of different types of landforms (including deltas, canyons, sand dunes, valleys, drumlins, lakes, sink holes, and caverns) for the class
Landform Jeopardy setup guide for each pair of students
Landform Jeopardy game cards for each pair of students

Background

Earth's landforms are the result of slow changes to Earth's surface. Landforms are created by the constructive and destructive forces of wind, water, and ice. These forces are in continuous action. Weathering breaks down rocks. Erosion moves material to other areas. Deposition creates new landforms. The results of these slow changes are evident when we observe landforms such as deltas, canyons, sand dunes, and caverns that take time to develop.

Procedure

Display the pictures and posters of different landforms to students. Identify each landform, and explain how different forces slowly changed Earth's surface to create the landform. Allow students to identify the processes (i.e., wind, water, and/or ice) that provided the force to cause the changes.

Divide the class into pairs of students. If the class has an uneven number of students, the remaining student may join a pair of students and act as the "game host." Distribute a *Landform Jeopardy* setup guide and a deck of *Landform Jeopardy* game cards to each group of students. Players lay the cards facedown in front of themselves. Players arrange the cards in columns according to category (i.e., wind-shaped landforms, water-shaped landforms, and ice-shaped landforms). The cards with the lowest point values are placed at the top of each column, and values increase toward the bottom of the column. Players use the setup guide to help them lay out the cards.

The student with the greater number of letters in his or her full name is the first player, Player A. Player A names a category and a point value (e.g., "ice-shaped landforms for 5 points"). Player B picks up the card and, without letting Player A see the front of the card, reads the question on it to Player A. Player A answers the question, and Player B checks that answer against the answer printed at the bottom of the card.

If Player A is correct, (s)he earns the point(s) equal to the point value of the card. (S)He keeps the card. If the question is answered incorrectly, (s)he earns no points. Player B reads the correct answer, and the card is placed in a discard pile. In either case, it is Player B's turn to choose a card.

Play continues in this manner until all cards have been read. Players then add the points on their cards. The player with more points is the winner.

If a group of three students is playing the game, the "game host" is the reader for all of the questions. The "game host" is allowed to switch places with a player for a second round of the game.

LANDFORM JEOPARDY SETUP GUIDE

WIND-SHAPED LANDFORMS	WATER-SHAPED LANDFORMS	ICE-SHAPED LANDFORMS
2 POINTS	1 POINT	3 POINTS
3 POINTS	2 POINTS	4 POINTS
4 POINTS	3 POINTS	5 POINTS
5 POINTS	4 POINTS	6 POINTS
[Shaded]	5 POINTS	[Shaded]
[Shaded]	6 POINTS	[Shaded]

Landform Jeopardy Game Cards

**Wind-Shaped Landform
2 points**



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**Wind-Shaped Landform
3 points**



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**Wind-Shaped Landform
4 points**



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**Wind-Shaped Landform
5 points**



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**Water-Shaped Landform
1 point**



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**Water-Shaped Landform
2 points**



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Landforms shaped by wind are the result of wind erosion and deposition. When wind blows over the land, it moves sediment on the land surface through the air, or by bouncing, sliding, or rolling sediment over the surface. What is erosion by wind action called?

Answer: deflation

These landforms are most often found along beaches and in deserts. Constantly shifting and moving, these landforms occur when wind lifts sand particles from one area and deposits them in another area. What are these landforms called?

Answer: sand dunes

In some dry climate areas, such as in Arizona, constant winds erode sand and finer sediments and polish and shape the remaining pebbles and larger stones on the ground. The remaining stones look like a street surface covered with cobblestones. What is the name of this landform?

Answer: desert pavement

When wind picks up sediments finer than sand, such as particles of clay and silt, the sediments are sometimes deposited far from their source. These deposits help to form fertile soil. What is the name of the landform that is formed by fine particles deposited by wind?

Answer: loess deposits

This fan-shaped landform lies at the mouths of rivers. Sediment carried downstream by the moving river is deposited when the river enters a larger, nonflowing body of water. What is this landform?

Answer: delta

Moving water in a river can carry great amounts of energy. Erosion of the riverbed and banks over a long period can lower the river's course so much that the original land surface rests hundreds or even thousands of feet above the river. What is the name of this gorge-like landform that is created when a river cuts through the land?

Answer: canyon

**Water-Shaped Landform
3 points**



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**Water-Shaped Landform
4 points**



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**Water-Shaped Landform
5 points**



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**Water-Shaped Landform
6 points**



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**Ice-Shaped Landform
3 points**



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**Ice-Shaped Landform
4 points**



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Groundwater can erode soft rock like limestone through chemical weathering. In areas of high rainfall where limestone lies near the ground surface, underground caves can form. If the roof of the cave collapses, it creates a landform like a big hole in the ground. What is the name of this landform?

Answer: sinkhole

This landform is created when a river floods over its banks, depositing soil carried by the river from upstream areas. The landform is flat and contains rich, fertile soil that is frequently farmed. Name this landform.

Answer: floodplain

Ocean waves erode land, depositing sediment along a coast. During storms such as hurricanes, waves erode sand on the bottom of shallow water, depositing the sand in a strip of land above sea level. Many people build homes on this landform, despite the risk of having the strip of land eroded away during the next storm. Galveston Island and South Padre Island are two of these landforms along the Texas Gulf Coast. What are these landforms called?

Answer: barrier island

When a river flows through rock or sediment that erodes easily, the outer banks become more eroded and the inner banks accumulate with sediment deposits. Over time, the river's course bends back and forth, making loops that become more curved. What landform name is used to identify this looplike bend in the river?

Answer: meander

A valley glacier moves slowly down valleys between mountains. As the glacier moves, it breaks and carries rocks on the valley floor and sides. When the glacier eventually melts or retreats, it leaves behind curved walls in the valley, shaped like the letter U. What type of landform is left behind by the retreating or melted glacier?

Answer: U-shaped valley

Moving ice and rocks in a glacier erode land in their path. When a glacier eventually melts, it leaves behind a mixture of sediments called till. Till deposited along the edges of a glacier create a ridge. What is the name of this landform?

Answer: moraine

Ice-Shaped Landform
5 points



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Ice-Shaped Landform
6 points



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Glaciers moving over existing moraines may smooth them through the eroding action of ice and rocks. The resulting landform is a long, smooth mound of till shaped in the direction of the glacier's flow. What are these landforms called?

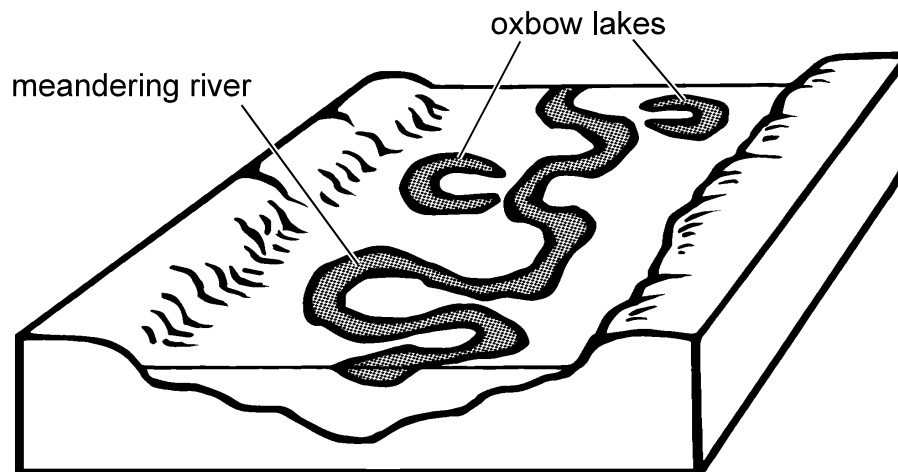
Answer: drumlins

Some glaciers cut valleys in a coastal region. A valley cut by a glacier will sometimes be filled by a rising sea, forming a long, narrow inlet. Many of these water-filled landforms can be found in Scandinavian countries like Norway and Finland. What are these landforms called?

Answer: fiord

Recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice.

- 1 Much of Earth's surface is shaped by the movement of water. Many landforms result from a river's ability to erode and deposit material from the finest sediment to the largest boulder. Which of the following landforms is **not** formed by water?
- A a sinkhole
 - B a barrier island
 - C a sand dune
 - D a canyon
- 2 Look at the flat area partly occupied by a meandering river.



What natural action flattens the surrounding land and enriches the soil?

- A Wind-driven sand erodes the high ground and fills the low areas.
- B Clay and silt are deposited in low areas every time the river floods.
- C Slow-moving river water carries clay and silt to low areas of the land.
- D Clay and silt from the riverbed are carried to the ocean.

- 3** The Mississippi River Delta is a large, fan-shaped landform at the mouth of the Mississippi River. The delta covers over three million acres. Which process changes Earth's surface to create landforms such as the Mississippi River Delta?
- A** Sediment carried downstream by moving water in rivers is deposited when the river enters a larger, nonflowing body of water.
 - B** Wind picks up fine sediments and carries them over the land surface and deposits them over a large, open area, such as a beach.
 - C** Fast-moving water in rivers erodes the riverbed and banks and widens the rivers until they form a fan-shaped delta.
 - D** Glaciers carrying large amounts of rock and sediment flow over land until they reach the ocean, where they deposit the rock and sediment as the glaciers melt.
- 4** The energy carried by fast-moving rivers erodes the riverbed and banks. Over a long period of time, the river's course is lowered hundreds or even thousands of feet, forming a gorge-like landform. Which landform is created when a river cuts through the land?
- A** an oxbow lake
 - B** a flood plain
 - C** a U-shaped valley
 - D** a canyon

- 5** Fjords are water-filled landforms that can be found in Alaska or in Scandinavian countries, such as Norway and Finland. Fjords are formed as a rising sea fills valleys in a coastal region. What force of nature cuts the valleys that are filled with water to become fjords?
- A** wind
 - B** glaciers
 - C** hurricanes
 - D** rivers
- 6** Sand dunes are found most often along beaches and in deserts. Sand dunes are constantly shifting and moving, changing their size and shape. Why are sand dunes a constantly-changing landform?
- A** Rivers flood regularly, moving loose sand from one area to another.
 - B** Humans constantly clear sand dune areas to make room for new construction.
 - C** Shifting winds constantly lift sand particles from one area and deposit them in another area.
 - D** Constant movement beneath Earth's surface shakes sand dunes, loosening and moving sand particles to different positions in the dunes.