

## Landforms of Illinois

**Grade Level:** 5 – 6

**Purpose:**

To introduce primary landforms of Illinois and how they were formed.

**Suggested Goals:**

Students will gain an understanding in how landforms are created.

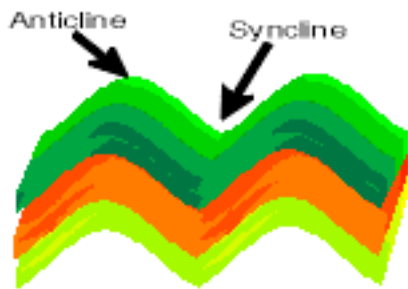
**Targeted Objectives:** As a result of this lesson students will:

- Gain an understanding of how landforms are created
- Understand what types of landforms are found in Illinois

**Background:**

What is a landform? A landform is a characteristically shaped feature of the earth's surface that is produced by natural forces. Here is a list of some common landforms:

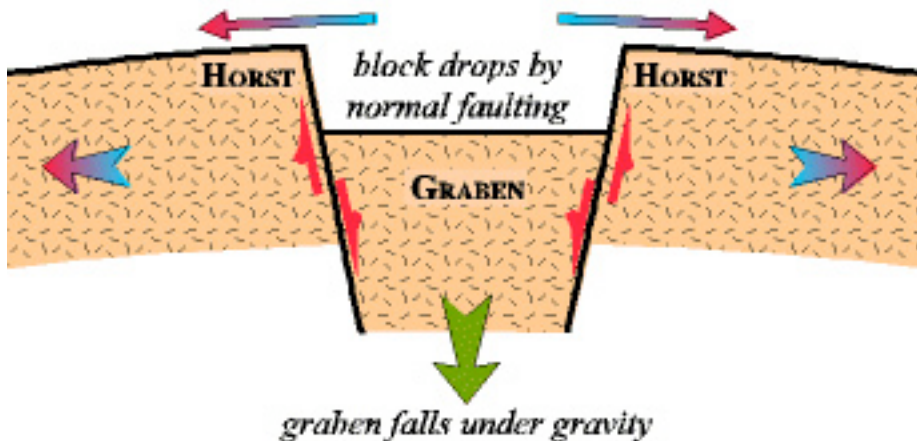
- **anticline**—a hill formed by the upward folding of a rock formation



- **beach**—the gently sloping shore of a body of water which is washed by waves, especially the parts covered by sand or pebbles
- **bluff**—a bank of sand or soil along the shore of rivers and lakes that rises steeply on the water side
- **braided stream**—a stream with a tangle of crisscrossing channels separated by sand bars or islands
- **cave**—a natural open space underground, large enough for a person to enter; most commonly occur by the dissolving of rocks, generally limestone
- **cliff**—a high, steep face of rock
- **cut bank**—the concave wall of a meandering stream that is maintained as a steep or even overhanging cliff by the water at its base
- **cuesta**—a ridge with a steep slope on one side and a gentle slope on the other side
- **delta**—a grouping of sediments accumulated where a stream flows into a body of standing water where its speed and transporting power are suddenly reduced; a "delta plain" is the upper surface of a delta

- **disconformity**—an unconformity in which the beds above the unconformity are parallel to the beds below the unconformity
- **dome**—an uplift or anticline-like structure, roughly circular in its outcrop exposure, in which beds dip gently away from the center in all directions
- **esker**—a winding ridge of layered drift material; forms in a glacial tunnel and, when ice melts, stands as a ridge up to 15m high
- **fault**—a crack or fracture in the earth's surface; movement along the fault can cause earthquakes or, in the process of mountain-building, can release underlying magma and permit it to rise to the surface
- **floodplain**—an area bordering a stream over which water spreads when the stream tops its banks
- **ground moraine**—till deposited from the main body of a glacier during its melting phase
- **hoodoo**—a column or pillar of rock produced by weathering in a region where heavy rainfall only falls sometimes; helped along when the rock layers are of varying hardness
- **joint**—a narrow crack in rock where there has been no significant movement of either side
- **kame**—layered drift material deposited in depressions and cavities in stagnant ice and then left behind as irregular, steep-sided hills when the ice melts
- **kame terrace**—a layered drift deposited between wasting glacier and adjacent valley wall; stands as a terrace when the glacier melts
- **karst**—a landscape that develops from the action of ground water in areas of easily dissolvable rocks; characterized by caves, underground drainage and sinkholes
- **kettle**—a kettle forms when a block of glacier ice breaks off from the front of the glacier during its retreat, and is buried by the sediment released from the glacier during melting
- **lake**—any standing body of inland water, generally of considerable size
- **landslide**—a general term for a slowly to very rapidly descending mass of rock or debris
- **levee**—a bank of sand and silt along stream bank built by deposits put down in small amounts during a series of floods
- **meander**—a sharp bend, loop, or turn in the path of a stream; when abandoned, called a meander scar or an oxbow
- **moraine**—a mound or ridge made largely of till
- **mound**—a low hill of earth, natural or artificial; in general, any prominent, isolated hill
- **natural bridge**—a natural stone arch that spans a valley of erosion
- **outwash**—beds of sand and gravel laid down by glacial melt water
- **outwash plain**—a plain underlain by outwash
- **overbank deposits**—sediments deposited from flood water on the floodplain
- **oxbow**—an abandoned meander, one that closes off and traps the stream
- **oxbow lake**—a lake in an abandoned meander
- **ravine**—a place which has been hollowed out by a stream of running water

- **rift (graben)**—an elongate crustal block that is dropped down between two fault systems. The Reelfoot Rift extends from Illinois southwest toward the Gulf of Mexico. The Reelfoot Rift continues to influence the central United States region. For example, the New Madrid Fault System lies within confines of the Reelfoot Rift. These faults are responsible for hundreds of earthquakes that occur in the central United States.



- **sand dune**—an accumulation of wind driven sand into a mounded shape
- **scarp**—a steep slope of some extent along the margin of a plateau, mesa, terrace, or bench
- **sinkhole**—a closed depression found on land surfaces that have limestone beneath; forms either by collapse of a cave roof or when water enlarges a crack in the limestone
- **sinking stream**—a stream that empties into the underground into a cave, usually through a sinkhole
- **slump**—a slippage of unstable material caused by erosion of weaker rock that underlies more resistant rock; may move in a matter of seconds or gradually slip over a period of several weeks
- **spit**—a sandy bar built out from the land into a body of water
- **spring**—a place where water flows naturally out of rock onto the land surface
- **stream terrace**—a relatively flat surface along a valley, with a steep bank separating it either from the floodplain, or from a lower terrace
- **structural basin**—a structure in which the beds dip toward a central point
- **syncline**—a valley formed by the downward folding of a rock formation (see diagram with *anticline*)
- **terminal moraine (end moraine)**—a ridge of till marking the farthest extent of a glacier
- **U-shaped valley**—a valley carved by glacier erosion and whose cross-valley profile has steep sides and a nearly flat floor, suggestive of a large letter "U"



- **unconformity**—a buried erosion surface separating two rock masses
- **valley**—any hollow or low-lying land bounded by hill or mountain range, and usually traversed by a stream or river which receives the drainage of the surrounding heights
- **valley train**—an outwash plain contained within valley walls

**Materials/Preparation:**

- Landform cards (one for each student)
- Geographic or topographic maps of Illinois
- Overhead markers
- Shoeboxes (one for each student)
- Rulers
- Baker's clay or model magic

**Procedure:**

**Part I:** Landform who am I?

Create landform cards for each student. Write a different landform of Illinois on each card, and tape the card to the back of each student. Using a standard "Twenty Questions" format, students will ask questions until they discover which landform they have. Once they have determined which landform they have they should tape it to the front of their shirt. You could create a word-wall (or use some other discussion technique which would draw on prior knowledge) with all of the information the students know about each of these landforms.

**Part II:** In groups of 3 to 4, have students research one of the landforms in the above list. Then, using one shoebox each, have the students create their landform in the shoeboxes using baker's dough or model magic. After each structure dries, students can discover what landform is in each box by using a ruler, a pencil, and graph paper to measure and draw the landform to determine which type is in each box. You might have them then present their landform to the class explaining its significance in Illinois.

**Part III:** Using a topographic map of Illinois, determine which landforms are in which areas of Illinois. The Internet may be used in this part also.

**Questions:**

How are the different landforms made (formed)?  
Which ones occur in Illinois?

**Extensions:** Email various schools in Illinois where different landforms occur for information and pictures of the landforms in their area.

**Assessment:** Students can develop a presentation of the various landforms discussed in this lesson.

**Lesson Specifics:**

- Skills—Students will need to use observation, inference, and data collection skills to complete the lab stations. Also, the students will need to use the Internet and a computer to access the assessment. Assessment of presentations will also be used.
- Duration—2 to 3 days
- Group size—Project may be completed individually or in groups of 3 or 4
- Setting—Classroom and computer lab with Internet access

**Illinois State Board of Education Goals and Standards:**

- 12.E.3b:** Describe interactions between solid earth, oceans, atmosphere and organisms that have resulted in ongoing changes of Earth.
- 17.B.3a:** Explain how physical processes including climate, plate tectonics, erosion, soil formation, water cycle, and circulation patterns in the ocean shape patterns in the environment and influence availability and quality of natural resources.

**Print Resources:**

- Wiggers, R. 1997. *Geology underfoot in Illinois*. Missoula, MT: Mountain Press Publishing Co.. Available from Illinois State Geological Survey Publications at <http://www.isgs.uiuc.edu/servs/pubs/pubzhome.htm> or phone (217) 244-2414

**Web Resources:**

- ISM GeologyOnline  
<http://geologyonline.museum.state.il.us>
- Landforms on Topographic Maps  
<http://www.csus.edu/indiv/s/slaymaker/Geol10L/landforms.htm>
- Landform images from Berkley  
<http://geoimages.berkeley.edu/GeoImages/Johnson/Landforms/Landforms.html>
- Fundamentals of Physical Geology  
<http://www.geog.ouc.bc.ca/physgeog/contents/11p.html>
- Illinois Surface Geology  
<http://www.isgs.uiuc.edu/nsdihome/webdocs/st-geolq.html>