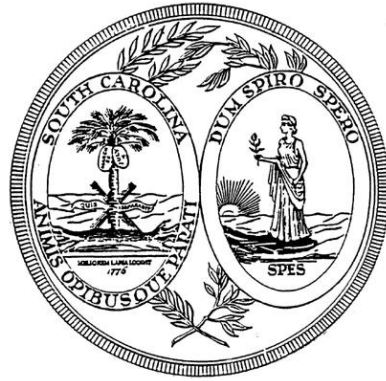


South Carolina Academic Standards and Performance Indicators for Science 2014



Instructional Unit Resource Earth Science

South Carolina Academic Standards and Performance Indicators for Science 2014

Earth Science Instructional Unit Resource

As support for implementing the *South Carolina Academic Standards and Performance Indicators for Science 2014*, the standards for Earth Science have been grouped into possible units. In the Overview of Units below, the titles for those possible units are listed in columns. Refer to the Overview document to note these unit titles and how Standards, Conceptual Understandings, Performance Indicators, Science and Engineering Practices, and Crosscutting Concepts align. Following the Overview of Units, an Instructional Unit document is provided that delivers guidance and possible resources in teaching our new *South Carolina Academic Standards and Performance Indicators for Science 2014*. The purpose of this document is to provide guidance as to how all the standards in this grade may be grouped into units and how those units might look. Since this document is merely guidance, districts should implement the standards in a manner that addresses the district curriculum and the needs of students. This document is a living document and instructional leaders from around the state will continuously update and expand these resource documents. These documents will be released throughout the 2016-2017 school year with the intentionality of staying ahead of instruction. Teachers should also note that links to the Standards document, A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas, the SEP Support Document, and the Support Document 2.0 are embedded throughout the Instructional Unit format for reference.

Acknowledgments

Jean Baptiste Massieu, famous deaf educator, made a statement that is now considered a French proverb. “Gratitude is the memory of the heart. Indeed, appreciation comes when you feel grateful from the depths of your heart. The head keeps an account of all the benefits you received and gave. But the heart records the feelings of appreciation, humility, and generosity that one feels when someone showers you with kindness.” It is with sincere appreciation that we humbly acknowledge the dedication, hard work and generosity of time provided by teachers and instructional leaders across the state that have made and are continuing to make the Instructional Unit Resources possible.

Earth Science Overview of Units

Unit 1		Unit 2		Unit 3	Unit 4	UNIT 5
EARTH SCIENCE: Astronomy		EARTH SCIENCE: Earth's Geosphere		EARTH SCIENCE: Paleobiosphere	EARTH SCIENCE: Atmosphere-Weather and Climate	EARTH SCIENCE: Hydrosphere
Standard		Standard		Standard	Standard	Standard
H.E.2		H.E.3		H.E.4	H.E.5	H.E.6
Conceptual Understanding		Conceptual Understanding		Conceptual Understanding	Conceptual Understanding	Conceptual Understanding
H.E.2.A	H.E.2.B	H.E.3A	H.E.3B	H.E.4A	H.E.5A	H.E.6A
Performance Indicators		Performance Indicators		Performance Indicators	Performance Indicators	Performance Indicators
H.E.2A.1	H.E.2B.1	H.E.3A.1	H.E.3B.1	H.E.4A.1	H.E.5A.1	H.E.6A.1
H.E.2A.2	H.E.2B.2	H.E.3A.2	H.E.3B.2	H.E.4A.2	H.E.5A.2	H.E.6A.2
H.E.2A.3	H.E.2B.3	H.E.3A.3	H.E.3B.3	H.E.4A.3	H.E.5A.3	H.E.6A.3
H.E.2A.4	H.E.2B.4	H.E.3A.4	H.E.3B.4	H.E.4A.4	H.E.5A.4	H.E.6A.4
H.E.2A.5		H.E.3A.5	H.E.3B.5	H.E.4A.5	H.E.5A.5	H.E.6A.5
		H.E.3A.6		H.E.4A.6	H.E.5A.6	H.E.6A.6
		H.E.3A.7		H.E.4A.7	H.E.5A.7	H.E.6A.7
		H.E.3A.8			H.E.5A.8	H.E.6A.8
						H.E.6A.9
*Science and Engineering Practices		*Science and Engineering Practices		*Science and Engineering Practices	*Science and Engineering Practices	*Science and Engineering Practices
S.1A.2	S.1A.6	S.1A.2	S.1A.5 S.1A.8	S.1A.2 S.1A.7	S.1A.2 S.1A.7	S.1A.1 S.1A.4
S.1A.4	S.1A.7	S.1A.3	S.1A.6 S.1B.1	S.1A.5 S.1A.8	S.1A.4	S.1A.2 S.1A.8
S.1A.5	S.1A.8	S.1A.4	S.1A.7	S.1A.6	S.1A.6	S.1A.3
*Crosscutting Concepts		*Crosscutting Concepts		*Crosscutting Concepts	*Crosscutting Concepts	*Crosscutting Concepts
1,2,3,4,5,7		1,2,4,6,7		1,2,3,4,5	1,2,5,6	2,3,4,5

**Teachers have the discretion to enhance the selected SEP's and CCC's.*

Unit Title
Earth's Hydrosphere
Standard
http://ed.sc.gov/scdoe/assets/file/agency/ccr/Standards-Learning/documents/South_Carolina_Academic_Standards_and_Performance_Indicators_for_Science_2014.pdf
H.E.6 The student will demonstrate an understanding of Earth's freshwater and ocean systems.

Conceptual Understanding					
H.E.6A. Water is an essential resource on Earth. Organisms (including humans) on Earth depend on water for life. Its unique physical and chemical properties are important to the dynamics of Earth systems. Multiple factors affect the quality, availability, and distribution of Earth's water.					
New Academic Vocabulary					
Some students may need extra support with the following academic vocabulary in order to understand what they are being asked to understand and do. Teaching these terms in an instructional context is recommended rather than teaching the words in isolation. A great time to deliver explicit instruction for the terms would be during the modeling process. Ultimately, the student should be able to use the academic vocabulary in conversation with peers and teachers. These terms are pulled from the essential knowledge portion of the Support Doc 2.0 (http://ed.sc.gov/instruction/standards-learning/science/support-documents-and-resources/) and further inquiry into the terms can be found there.					
Alluvial Basin	Aquifer	Aquitard	Bedrock Basin	Beach Nourishment	Breakwater
Caverns	Chemosynthesis	Coriolis effect	Deep Current	Discharge	Drainage Basin
Erosion	Flood	Glacier	Gravel	Gradients	Groin
Groundwater	Hot Spring	Hydrothermal vent	Ice-Cap	Infrared Radiation	Jetty
Karst topography	lake	Longshore Current	Nonpoint source pollution	Ocean	Ocean Pollution
Lake	Precipitation	Point source pollution	pond	Run Off	Salinity
Photosynthesis	Water cycle	Velocity			
Sand	Seawall	Silt	Sinkholes	Spring	Stream Bed

Surface Current	Tide	Turbidity Current	Upwelling	Water Cycle	Watershed
Water Table	Zone of Aeration	Zone of Saturation			
Performance Indicators Text highlighted below in orange and <i>italicized/underlined</i> shows connections to SEP's.					
H.E.6A.1 <u>Analyze and interpret data</u> to describe and compare the physical and chemical properties of saltwater and freshwater. H.E.6A.2 <u>Obtain and communicate information to explain</u> how location, movement, and energy transfers are involved in making water available for use on Earth's surface (including lakes, surface-water drainage basins, freshwater wetlands, and groundwater zones). H.E.6A.3 <u>Plan and conduct controlled scientific investigations</u> to determine how a change in stream or flow might affect areas of erosion and deposition of a meandering alluvial stream. H.E.6A.4 <u>Analyze and interpret data</u> of a local drainage basin to predict how changes caused by human activity and other factors influence the hydrology of the basin and amount of water available for use in the ecosystem. H.E.6A.5 <u>Analyze and interpret data</u> to describe how the quality of the water in drainage basins is influenced by natural and human factors (such as land use, domestic and industrial waste, weather/climate conditions, topography of the river channel, pollution, or flooding). H.E.6A.6 <u>Develop and use models</u> to explain how groundwater processes affect limestone formations leading to the formation of caves and karst topography. H.E.6A.7 <u>Obtain and communicate information</u> to explain how the convection of ocean water due to temperature and density influence the circulation of oceans. H.E.6A.8 <u>Develop and use models</u> to describe how waves and currents interact with the ocean shore. H.E.6A.9 <u>Ask questions</u> about the designs of devices used to control and prevent coastal erosion and flooding and evaluate the designs in terms of the advantages and disadvantages required for solving the problems.					
*Science and Engineering Practices Support for the guidance, overviews of grade level progressions, and explicit details of each SEP can found in the Science and Engineering Support Doc (http://ed.sc.gov/scdoe/assets/File/Instruction/standards/Science/Support%20Documents/Complete_2014SEPsGuide_SupportDoc2_0.pdf). It is important that teachers realize that the nine science and engineering practices are not intended to be used in isolation. Even if a performance indicator for a given standard only lists one of the practices as a performance expectation, scientists and engineers do not use these practices in isolation, but rather as part of an overall sequence of practice. When educators design the learning for their students, it is important that they see how a given performance expectation fits into the broader context of the other science and engineering practices. This will allow teachers to provide comprehensive, authentic learning experiences through which students will develop and demonstrate a deep understanding of scientific concepts.					
H.E.1A.1 <u>Ask questions</u> to (1) generate hypotheses for scientific investigations; (2) refine models, explanations, or designs; or (3)					

extend the results of investigations or challenge scientific arguments or claims.

H.E.1A.2 Develop and use models to (1) understand or represent phenomena, processes, and relationships; (2) test devices or solutions; or (3) communicate ideas to others.

H.E.1A.3 Plan and conduct controlled scientific experiments to answer questions, test hypotheses, and develop explanations: (1) formulate scientific questions and testable hypotheses based on credible scientific information; (2) identify materials, procedures, and variables; or (3) use appropriate lab equipment, technology, and techniques to collect qualitative and quantitative data; and (4) record and represent data in an appropriate form. Use appropriate safety procedures

H.E.1A.4 Analyze and interpret data from informational texts and data collected from investigations using a range of methods (such as tabulation, graphing, or statistical analysis) to (1) reveal patterns and construct meaning; (2) support or refute hypotheses, explanations, claims, or designs; or (3) evaluate the strength of conclusions.

H.E.1A.8 Obtain and evaluate scientific information to (1) answer questions; (2) explain or describe phenomena; (3) develop models; (4) evaluate hypotheses, explanations, claims, or designs; or (5) identify and/or fill gaps in knowledge. Communicate using the conventions and expectations of scientific writing or oral presentations by (1) evaluating grade-appropriate, primary or secondary scientific literature or (2) reporting the results of student experimental design.

***Cross Cutting Concepts** (<http://www.nap.edu/read/13165/chapter/8>)

The link above provides support from the Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas (2012). The text in **blue** and ***italicized/underlined*** below provides a brief explanation of how the specific content ties to the CCC's.

2. **Cause and effect: Mechanism and explanation** The National Research Council (2012) states that “events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts” (p. 84).

Human dumping of toxic waste can have an immediate (acute) effect on stream biota at high enough levels. This can lead to the elimination of sensitive species and disrupting ecosystem balance over time.

3. **Scale, proportion, and quantity:** The National Research Council (2012) states that “in considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system’s structure or performance” (p. 84). ***Water flow can be strong enough to suspend particles in the water column as they move downstream, or simply push them along the bottom of a waterway.***

4. **Systems and system models:** The National Research Council (2012) states that “Defining the system under study—specifying its boundaries and

making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering” (p. 84). *The ocean is a major player in the Earth system. It is in constant motion. Winds drive currents on the ocean surface and these currents in turn mix down into the ocean depths and drive Earth's weather patterns.*

5. *Energy and matter:* The National Research Council (2012) states that “tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems’ possibilities and limitations” (p. 84). *The water cycle describes the existence and movement of water on, in, and above the Earth. Earth's water is always in movement and is always changing states, from liquid to vapor to ice and back again.*

**Teachers have the discretion to enhance the selected SEP’s and CCC’s.*

Prior Knowledge

- 3.E.4 Water
- 5.E.3 Oceans, watershed, basin, pollution, current
- 6.E.2 Water cycle, solar energy, convection
- 7.P.2B.1 Physical and chemical properties
- 8.E.5 Weathering, erosion, and deposition
- 8.E.6 Impacts of catastrophic events - flooding

Subsequent Knowledge

- H.C.5 Acids
- H.B.6B Global climate

Possible Instructional Strategies/Lessons

Strategies and lessons that will enable students to master the standard and/or indicator.

- H.E.6A.1
 - Will an Ice Cube Melt Faster in Freshwater or Saltwater?: Students evaluate whether fresh or salt water will cause an ice cube to melt faster and evaluate why. This source can be found at <https://blossoms.mit.edu/sites/default/files/video/guide/Ice-CubeMelt-Teacher-Guide.pdf>.

- H.E.6A.1
 - Density differences due to Salinity: Students or teachers can model and evaluate the density of fresh and salt water by testing whether or not an egg will sink or float. This source can be found at <https://explorable.com/salt-water-egg-experiment>.
 - Open Water: Students will complete a project-based learning activity where they are told they are stranded in a raft and have no fresh water and no help in sight. The teacher will decide what items are found in the boat. The students must create a solar still to make fresh water in order to survive. The students are responsible for designing and testing their own devices. The teacher will need to research solar still designs to develop a list of items for the boat, keeping in consideration the various items that would allow the students to design and create solar stills. An article for the teacher that discusses the various design of solar stills to help in the decision making process for materials to be included in the raft can be found at <https://www.hindawi.com/journals/isrn/2012/569381/>.
 - A Drop in the Bucket: This activity can be done as a demonstration or lab to have students model and calculate amount of water, freshwater, and available potable water. This source can be found at <http://www.miseagrant.umich.edu/lessons/lessons/by-broad-concept/earth-science/water-quantity/324-2/hwater>.
- H.E.6A.2
 - The Incredible Journey: Through rolling dice and moving around the classroom, students model behavior of a molecule of water as it cycles through the water cycle. This source can be found at http://files.dnr.state.mn.us/education_safety/education/project_wet/sample_activity.pdf.
 - Water Cycle Model: Students build a model to demonstrate the water cycle and answer questions based on their observations. This source can be found at https://www.ucar.edu/learn/1_1_2_4t.htm.
 - Comparative Study of Surface Water Quality: Students will test and evaluate the quality of various surface waters. This source can be found at https://www.vrg.org/environment/Lesson_Plans_Grades_9-12.doc.

- A River Runs Through It: Students are given portions of a river and are told they must have certain criteria on their plot of land. At the end, all pieces are put together and they can see how their plan has impacted communities downriver, as well as what consequences result in their communities based on the decisions of those upriver. This source can be found at http://d32ogoqmya1dw8.cloudfront.net/files/NAGTWorkshops/environmental/activities/river_runs_through_activity_1337709711.pdf.
- Readers' Theater: Water Cycle: Students model the water cycle by partaking in "characters" that represent different parts of the water cycle. This activity can strengthen lower-level readers' skills. This source can be found at <http://www.enchantedlearning.com/rt/weather/watercycle.shtml>.

- H.E.6A.3

- Fieldwork with Rivers: This activity includes fieldwork opportunities for measuring and evaluating features of streams/rivers. This source can be found at <http://www.rgs.org/OurWork/Schools/Fieldwork+and+local+learning/Fieldwork+techniques/Rivers.htm>.
- Determining Stream Velocity and Discharge: Students calculate and determine velocity and discharge of a stream. This source can be found at <http://www.hrwc.org/wp-content/uploads/2014/02/StreamSpeedDischarge.pdf>.

- H.E.6A.4

- SC Drainage Basin Activity: Students model and evaluate how the SC drainage basins work to move water from areas of higher elevations to lower elevations. This source can be found at http://ci.coastal.edu/research/gk-12/media/plans/high_school/topography_scaquarium.pdf.
- Where do Rivers Go?: This activity determines how the water flows through the watershed. Students can extend this assignment by evaluating local and state environmental policies that impact watersheds. They may also use the recent flooding and weather impacts (October flood 2015 and Hurricane Matthew October 2016) to evaluate what was observed, and why it occurred, as well as future planning. This source can be found at http://www.cosee-se.org/files/southeast/WheredoRiversgo_Lesson1.pdf.

- H.E.6A.5

- Watershed Research: Students research specific watersheds and indicate point and nonpoint sources of pollution. They present the material to the class and together develop an understanding of South Carolina's overall water quality. This source can be found at <http://www.carolana.com/SC/Tr>.
- How Does Land Use Affect Water Infiltration and Runoff?: Students use a model to simulate how various land uses affect rates of runoff and infiltration. Extension opportunities are present in this lesson. This source can be found at <http://omp.gso.uri.edu/ompweb/doe/teacher/pdf/act10.pdf>.
- What is Groundwater Doing to the Neighborhood?: Students evaluate the impact polluted groundwater can have on humans. The dangers of groundwater pollution is that we cannot easily detect it, nor easily clean it up. Extension may involve clips from Erin Brockovich, or interviews with the real Erin Brockovich found on youtube. This source can be found at <http://www.wef.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=2553>.
- Water Pollution: What Can We Do?: Students model a body of water that receives various sources of pollution. Extension for 9-12 graders include microbial contamination. This source can be found at <http://omp.gso.uri.edu/ompweb/doe/teacher/pdf/act9.pdf>.
- How to Clean up an Oil Spill: Students develop and describe techniques to clean up oil spills in the ocean. Extension for 9-12 graders includes determining different densities of oil and how that may affect clean-up efforts. This source can be found at <http://omp.gso.uri.edu/ompweb/doe/teacher/pdf/act13.pdf>.

- H.E.6A.6

- Karst Topography Paper Model: Students build and manipulate a paper model of Karst topography that will teach them about sinkholes, caves, and springs, and understand how water moves underground. This source can be found at http://nature.nps.gov/geology/education/StudentPages_karsttopography_New.pdf.

- Building a Sugar Karst Cave (Sinkhole): Students build terrain with sugar cubes, then allow “groundwater” to dissolve and erode material away to model how a sinkhole can form. This source can be found at <http://educationpossible.com/geography-activities-make-sugar-karst-cave-sinkhole/>.

- H.E.6.A.7

- Climate and Currents: Students receive information concerning ocean current formation and how the sun drives the system. They then must map winds and currents and then create ocean current cards based on their descriptions. See pages 1-27. This source can be found at <http://www.cosee-west.org/oceanglobe/pdf/climatecurents/currentsentire.pdf>.
- Ocean Currents and Coastal Temperatures: Students collect data about air and water temperatures to evaluate the impact each has upon each other. This is a lead-in to discussing the driver of ocean currents driven by convection. This source can be found at https://er.jsc.nasa.gov/seh/Ocean_Planet/activities/ts1ssac4.pdf.
- Colorful Convection Currents: This can be done as a demonstration or a lab where students model temperature OR density differences impacting currents and movement. Colored water should indicate either hot/cold (in activity), or salt/fresh (NOT in activity). This source can be found at <http://www.stevespanglerscience.com/lab/experiments/colorful-convection-currents/>.

- H.E.6A.8

- Coastal Erosion: Students plot data referring to sand volume. Extension beyond graphing requires them to infer what this data means about the coastlines. Apply the inferences to South Carolina coasts. Students can then research how SC beaches are faring with sea level rise. What can they expect to happen in the future? This source can be found at <https://www.arm.gov/education/teacher-tools/lessons/coastal-erosion>.
- Who Moved the Beach?: This activity uses NOAA exploration into shoreline erosion. This source can be found at http://oceanservice.noaa.gov/education/classroom/lessons/09_coastmanag_erosion.pdf.

- H.E.6A.8 and H.E.6A.9
 - Where's the Beach?: Students evaluate processes of the beach and erosional and depositional processes because of waves, tides, and currents as well as coastal preservation attempts. This source can be found at <http://www.norwichcsd.org/Downloads/lab%20-%20COASTAL%20EROSION.pdf>.
- H.E.6A.9
 - Erosion...can you fight it?: This lesson requires students to determine energy in a wave, identify erosional defense structures, and design a form of shoreline defense and determine materials required to build their solution to the problem. This source can be found at <http://ciese.org/curriculum/tideproj/teachererosion/>.
 - Discovery: Flood!: The activity requires students to evaluate how soil will impact flood waters: Will it drain or pool? This can be adapted for the coastline and watersheds by requiring students to evaluate the soil types near those areas and then infer what would happen in the event of a flood in that area. This source can be found at <http://www.discoveryeducation.com/teachers/free-lesson-plans/flood.cfm>.

Resources

- AGI Surface Water: American Geosciences has articles and resources regarding surface water availability and effects on surface water. This source can be found at <http://www.americangeosciences.org/critical-issues/faq/what-is-surface-water-and-what-affects-its-availability>.
- USGS Freshwater Data: This site contains the USGS Surface-Water Data for the Nation. This source can be found at <http://waterdata.usgs.gov/nwis/sw>.
- USGS Streamflow Data: The USGS provides information about rivers, watersheds, and how they change and are studied. This source can be found at <http://water.usgs.gov/edu/watercyclestreamflow.html>.
- Stream Processes: This site contains information about how streams work, transport sediment, and how to identify ages of streams based on how they look. This source can be found at http://www.columbia.edu/~vid1/streams_basic.htm.

- Determining Channel Geometry and Flow Characteristics: This site provides equations and information regarding determining geometry and flow of rivers and streams. This source can be found at http://www.earthonlinemedia.com/ebooks/tpe_3e/fluvial_systems/channel_geometry_and_flow.html.
- Building a Stream Table: This can be done by the teacher, or by the students (to build a model) and then manipulated by students to demonstrate how water flows, rivers shape, and flooding may occur. This source can be found at <http://www.mrhollisterphoto.com/stream-table.html>.
- SC DNR River Basins: This website links to the South Carolina major river basins. Teachers may also consider downloading Google Earth to help students visualize the river basins. This source can be found at <http://www.dnr.sc.gov/water/river/basins.html>.
- DHEC: Water: This resource is about water quality and pollution for South Carolina. This source can be found at <http://www.scdhec.gov/HomeAndEnvironment/Water/>.
- Coastal Waccamaw Stormwater Education Consortium: This site contains several teacher and student resources and activities to teach about stormwater and water quality. This source can be found at <http://cwsec-sc.org/264/lessons-activities/>.
- NOAA Water Temperatures for Coastal Regions: This resource for coastal water temperatures can allow students to compare the differences and reasons for differences around our country. This source can be found at <https://www.nodc.noaa.gov/dsdt/cwtg/all.html>.
- Currents and Climate: This is a collection of lesson plans dealing with the formation of ocean currents and winds. This source can be found at <http://www.cosee-west.org/oceanglobe/pdf/climatecurrents/currentsentire.pdf>.
- Humans and Erosion: This is a series of lessons that can be used to discuss human impact on erosion. This source can be found at <http://www.weblessons.com/Teacher/guide.php?lessonID=554&dallaszoo>.

- **Watershed Research:** Students research specific watersheds and indicate point and nonpoint sources of pollution. They present the material to the class and together develop an understanding of South Carolina's overall water quality. This source can be found at <http://www.carolana.com/SC/Tr>.

Sample Formative Assessment Tasks/Questions

Additional sample formative assessment tasks/questions for grade bands are located at the end of each of the SEP Support Doc.

(http://ed.sc.gov/scdoe/assets/File/instruction/standards/Science/Support%20Documents/Complete_2014SEPsGuide_SupportDoc2_0.pdf)

- Present students with common or predictable misconceptions about pollution. Have students identify sources and extend their processes outward toward impact on local biotic factors as well as abiotic factors (for example, acidification and limestone in Florida).
- Give students index cards and ask them to answer a question on each side. Side 1: What is the main idea of the work we have done today? Side 2: What did you not understand?
- Quick Write: The strategy asks learners to respond in 2–10 minutes to an open-ended question or prompt posed by the teacher before, during, or after reading.
- Community Awareness: Discuss possible water quality issues/sources and write to local leaders to provide potential solutions.
- The Twitter Post: Have the students create a fake (could be real if you make an account for your class) twitter post in 140 characters or less answering a question or summarizing the lesson.
- Socratic seminar: Students read articles pertaining to topics in hydrology and come together for a Socratic seminar.
- Graphic organizers: <https://wvde.state.wv.us/strategybank/GraphicOrganizers.html>
- Inside-Outside Circle discussion or reading summary: <https://wvde.state.wv.us/strategybank/Inside-OutsideCircle.html>
- Four Corners check for Understanding: Students move themselves into corners of the room in a variety of ways including multiple choice (each corner is A, B, C, D), topics of discussion (strongly agree, agree, disagree, strongly disagree), personal understanding (completely understand, somewhat understand, somewhat unsure, completely lost).

- Individual whiteboards allow students to answer questions or perform calculations and show the teacher their understanding of a topic. Alternate forms of a similar assessment include Plickers or SMARTResponse clickers.
- Appointment Clocks allow students to have twelve different partners with which to meet and discuss a topic, or pair share. Teachers can tell students: “Meet with your ____:00 appointment and discuss ____.” This resource can be found at <https://wvde.state.wv.us/teach21/AppointmentClock.html>.

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