Watersheds & Weather *Teacher's Guide*

Students practice their skills while learning about watersheds, water level and rainfall.

Grade Level: Middle School

Subject Area/Course: Reading, Writing (Language Arts) and Math

Performance Objectives:

References are to the Next Generation Sunshine State Standards (2007).

Language Arts

LA.6.1.6.3	The student can use context clues to determine meanings of unfamiliar words.
LA.6.3.3.2	The student is able to create clarity and logic by rearranging words, sentences, and paragraphs, adding transitional words, incorporating sources directly and indirectly into writing, using generalizations where appropriate, and connecting conclusion to ending (e.g., use of the circular ending).
LA.6.2.2.3	The student will organize information to show understanding (e.g., representing main ideas within text through charting, mapping, paraphrasing, summarizing, or comparing/contrasting).
LA.7.1.7.3	The student can determine the main idea or essential message in grade-level or higher texts through inferring, paraphrasing, summarizing, and identifying relevant details.

Math

MA.8.A.6.4	Perform operations on real numbers (including integer exponents, radicals, percents, scientific notation, absolute value, rational numbers, and irrational numbers) using multi-step and real world problems.
MA.7.A.3.2	Add, subtract, multiply, and divide integers, fractions, and terminating decimals, and perform exponential operations with rational bases and whole number exponents including solving problems in everyday contexts.
MA.8.G.5.1	Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)) and dimensions including temperature, area, volume, and derived units to solve problems.
MA.6.S.6.1	Determine the measures of central tendency (mean, median, and mode) and variability (range) for a given set of data.
MA.8.A.1.6	Compare the graphs of linear and non-linear functions for real-world situations.

Academic Outcomes/Lesson Objectives:

- Students will read a selection accessible from the Seminole Watershed Atlas.
- Students will respond to FCAT-type questions or prompts in Reading, Writing, and Math.

Duration: One instructional period for the FCAT Practice, one instructional period for the website work

Teacher Background Information:

A watershed includes all of the lands and waters that drain into a particular location. Small areas drain into streams. These streams drain into rivers. Rivers drain into oceans. In this way, all water bodies are linked together. High levels of rainfall increase the volume of water in the watershed, increasing the overall water level. Since water level is impacted by rainfall, this means that weather systems, including prolonged drought, can affect the volume of water flowing through a watershed.

Teacher Website Resources:

- Sunshine State Standards can be found at http://www.cpalms.org/

Materials Needed:

Internet access with www.Seminole.WaterAtlas.org bookmarked, student pages for "Watersheds and Weather".

Safety: N/A

Vocabulary:

watershed
An area of land that collects, stores and transports all forms of precipitation.

gravity
(1) The fundamental force of attraction that all objects with mass have for each other; (2) the force of attraction of objects to the Earth.

drainage basin
Another name for a watershed.

hydrologist
A person who studies the science that deals with water as it occurs in the atmosphere, on the surface of the ground, and underground.

channel
The path that a river, stream, or other flowing water takes from a higher to lower point.

river basin
The watershed of a river; that area of land that drains into a river.

conservationist

A person who advocates or acts for the protection and preservation of the environment and wildlife.

KEY:

Reading

1. b. LA.E.1.3.3, Bloom's Taxonomy Level One
2. c. LA.A.1.3.2, Bloom's Taxonomy Level Two
3. b. LA.A.2.3.1, Bloom's Taxonomy Level One
4. a. LA.A.2.3.2, Bloom's Taxonomy Level Two

Writing For All – Use the rubric for Florida Writes! – 6 points

1. LA.B.2.3.3
2. LA.B.2.3.3
3. LA.B.2.3.3
4. LA.B.2.3.3

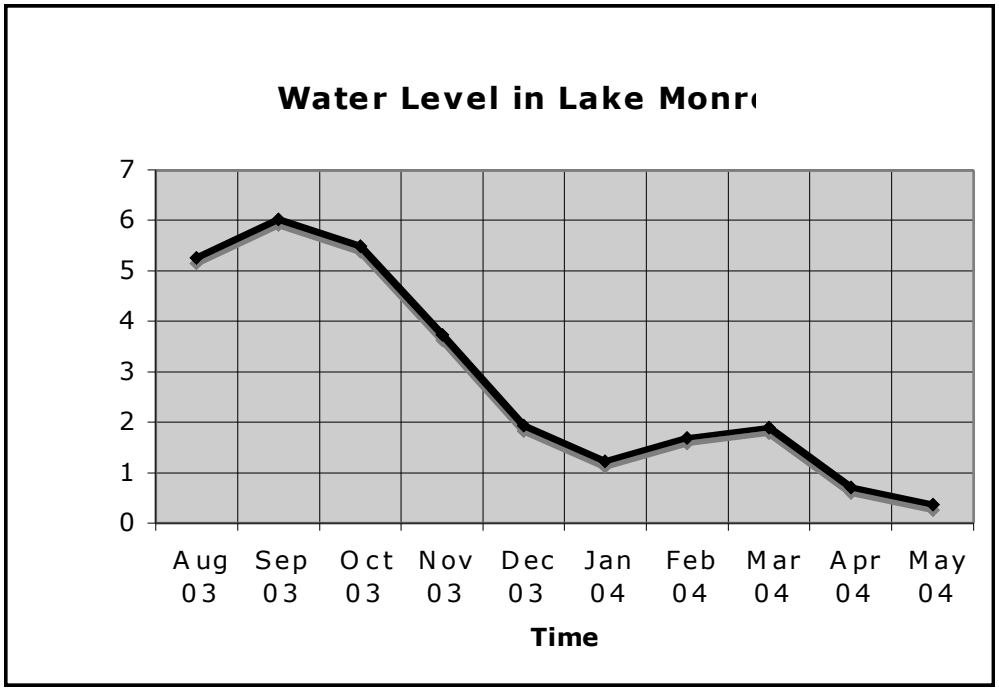
Math

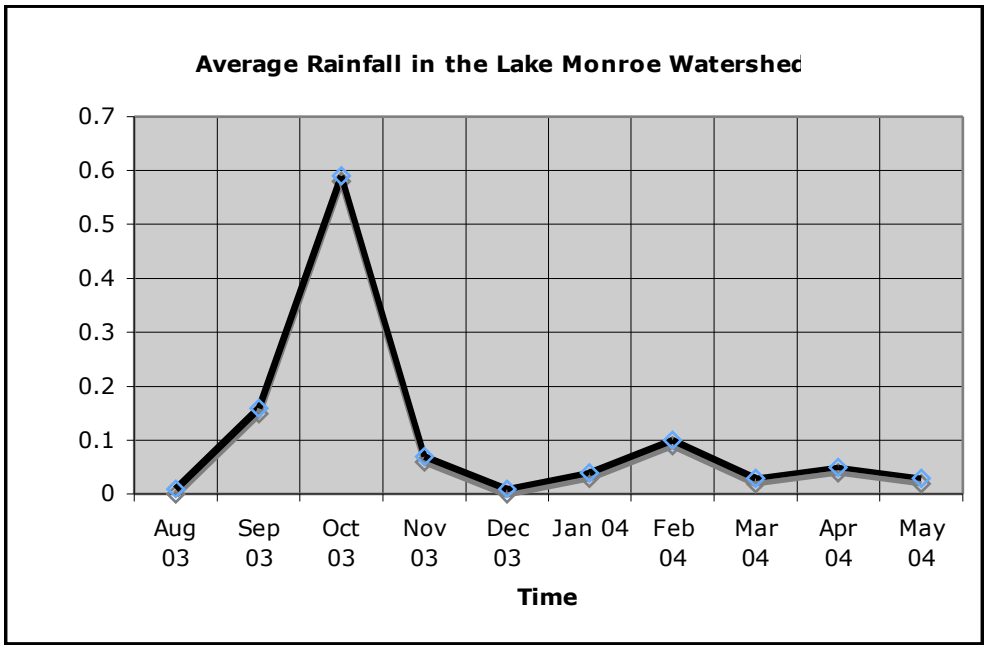
1. b. MA.B.2.3.2
2. d. MA.E.1.3.3
3. c. MA.D.1.3.1
4. Use the rubric for Extended Response Math Questions – 4 points MA.D.1.3.1

   Example of a Top-Score Response:

   It is not an exact correlation, but in general, when rainfall is lower, water level is also lower. When rain-fall is higher, water level is higher too. However, the August data does not match this pattern. More data is needed to confirm a correlation.

   (Example charts below)





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Procedure:

1. Preview this activity. Print copies for your students.
2. Preview the Seminole Water Atlas:
   a. Go to www.Seminole.WaterAtlas.org > Explore > Water Resources > Choose St. Johns River from the drop-down menu. Look over the General Info page.
   b. Then click on Hydrology > "Data Table and Graphs" for Water Level. Choose a station and check out the two-year graph. On the Hydrology page, click on "Learn More about Water Levels" and glance over the page for more information.
   c. Click on Water Levels & Flows > Data Tables and Graphs for both Flow and Water Level. Check out the two-year graph and review the information in "Learn More About" Flow and Water Level.
   d. To download flow and water level data, start at the bottom of the Water Levels & Flow page. Scroll Down and click on Advanced Data Features > Data Download and Advanced Graphing Tool> Accept> Surface Water Hydrology > Select Water Atlas and Water Body Name > Submit > Graph Data. Choose a sampling station with any 2-year period. With this data, you can compare flow and water level from this time with the data in the activity below.
   e. Click on Data & Mapping > Real-Time Data. (If no Real-Time Data station is in your watershed, click on Real-Time Data and then on the red star on the map closest to your location.) You can view and print 24 hours worth of rainfall data entered every 15 minutes (the two-day graph icon). Compare graphs of different watersheds to see scattered showers! (As an alternative, you can retrieve rainfall data from the Florida Automated Weather Network (FAWN) at http://fawn.ifas.ufl.edu/.)
3. Lead your students on a virtual tour of your watershed via the Seminole Water Atlas Website (outlined in 2 a-e above) after they have completed the FCAT Practice Activity. Or, print number 2 above as a student sheet for independent or small group exploration.
4. Using the information learned in the Skills Practice and the Water Atlas, discuss the watershed in which your school is located.