

Rainfall & Water Level Graphs *Teacher's Guide*

Students make and analyze graphs to discover relationships between rainfall and water level

Grade Level: Middle School and High School

Performance Objectives:

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

Science

SC.7.N.1.4 Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.

Math

MA.7.G.4.4 Compare, contrast, and convert units of measure between different measurement systems (US customary or metric (SI)), dimensions, and derived units to solve problems.

MA.912.S.3.2 Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following: bar graphs, line graphs, stem and leaf plots, circle graphs, histograms, box and whiskers plots, scatter plots, and cumulative frequency (ogive) graphs.

Academic Outcomes/Lesson Objectives:

- Students will demonstrate knowledge of the school server by navigating between web site and student folder.
- Students will create a data table using the website and Excel.
- Students will complete a graph showing data downloaded
- Students will create a word processing document and insert a graph and photo.
- Students will write a hypothesis and draw a conclusion.

Background Information For Teacher:

Water levels in Florida Lakes are influenced by rainfall. Stormwater may go directly into a lake or river through storm drains or directly from lawns. Rainwater also infiltrates (enters) and percolates (moves through) into the soil. Retention ponds hold stormwater, giving it time to seep into the ground. The groundwater seeps into lakes and rivers. During times of drought, lake levels fall. During times of heavy rainfall, lake levels rise.

The data students find will show water above average, dipping down below average during the droughts, and then back up again. Students can research local news media for reports and personal stories of rainfall and water levels during times of drought and flood.

Teacher Prep:

Explore the [Seminole County Water Atlas](#) website. Bookmark the site on student computers. Test out the activity using a nearby lake. Not all lakes have sufficient data for a graph. Some have too much, so you may need to pre-select the source and/or period of record. Different

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versions of software may have different commands to copy data and create graphs. Adjust the directions as needed. Students can then try other lakes of their choosing.

In this activity, students create a graph with Excel and write formulas to convert data. They create a hypothesis and use their graphs and to draw conclusions based on the data. They create a Microsoft Word document to organize the components. Directions for making a presentation in Power Point may be substituted.

In Part One, students will place a graph and a lake photo into a Word document. If students would rather have the lake photo as part of the graph, open the picture that was saved, copy, and paste it into the graph. Resize and position the photo. The picture will be part of the graph when transferred to the Word Document.

Duration: 1 to 2 class periods, depending on the number of waterbodies investigated and student skills in Excel, Word and/or PowerPoint.

Materials Needed: Computers connected to the Internet and www.Seminole.WaterAtlas.org bookmarked, student access to printer.

Safety: N/A

Vocabulary:

hydrology

The science that deals with water as it occurs in the atmosphere, on the surface of the ground, and underground.

variable

A quantity capable of assuming any of a set of values, or a symbol that represents such a quantity.

hypothesis

A specific, testable prediction about what you expect to happen, or what you are setting out to prove (or disprove), a tentative statement about the possible relationship between two or more conditions or variables.

conclusion

A statement that explains the findings of a scientific investigation or experiment.

Evaluation:

1. The student will demonstrate to the teacher the ability to move from one folder to another on the server.
2. The students will print out a copy of the completed data table, graph, observations and answers to the questions. The printout will also include a photo of the waterbody.

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Water Atlas Curriculum Lesson 34

3. Students will form a hypothesis, print additional graphs using the Water Atlas website graphing tool and a spreadsheet program, and draw conclusions.
4. The students will define the vocabulary words and use each correctly in a paragraph written about the activity.

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