

Temperatures & Dissolved Oxygen *Teacher's Guide*

GRADE LEVEL: 9th - 12th

SUBJECT AREA/COURSE: Science/Math

ACADEMIC OUTCOMES/LESSON OBJECTIVES:

- Students will determine what sensors measure and what they look like.
- Students will discover where sensors can be located.
- Students will obtain and analyze real-time data.
- Students will interpret graphs and draw conclusions.

TEACHER INFORMATION: Time measured on the Coastal Ocean Monitoring and Prediction System (COMPS) sites is recorded in UTC units. UTC stands for Universal Time Coordinated. Scientists all over the world use this unit to measure time because it is internationally recognized. Understand that the UTC time shown can be converted to EST (Eastern Standard Time) our local time by subtracting either 4 when we are in daylight savings time or subtracting 5 when we are not in daylight savings time. Daylight savings time is from 2a.m. on the 2nd Sunday in March to 2a.m. on the 2nd Sunday in November. DST is not observed in Puerto Rico, Hawaii, or Arizona, with the exception of the Navajo Nation, which does observe DST, even in Arizona. This explains why it is easier for scientists around the world to use UTC instead of manipulating time stamps on a regular basis.

Preview the student activity paying close attention to the times recorded on the graphs.

NOTE: As data is real time and sensors require maintenance, potential discrepancies may exist.

MATERIALS NEEDED: Internet access with www.Pinellas.WaterAtlas.org bookmarked, copies of student handout, calculator or pencil and paper if teacher requires work to be shown.

AUTHOR: Glenda J. Hurst - Modified by Anamarie Rivera from the original lesson plans created for the Environmental Distance Learning website.

TEACHER WEBSITE RESOURCES:

- Sunshine State Standards can be found at <http://www.fldoe.org/bii/curriculum/sss/>
- Information about FCAT can be found at <http://fcat.fldoe.org/>
- FCAT rubric information can be found at <http://fcat.fldoe.org/rubrcpag.asp>
- More FCAT-Friendly Activities, visit <http://pelotes.jea.com>

SUNSHINE STATE STANDARDS:

SCIENCE:

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| SC.912.L.17.2 | Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature. <i>Cognitive Complexity/Depth of Knowledge Rating: High</i> |
| SC.912.L.17.3 | Discuss how various oceanic and freshwater processes, such as currents, tides, and waves, affect the abundance of aquatic organisms. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i> |

Name:

Date:

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SCIENCE continued:

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| SC.912.N.1.1 | Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: <i>Cognitive Complexity/Depth of Knowledge Rating: High</i> |
| | 1. pose questions about the natural world, |
| | 2. conduct systematic observations, |
| | 3. examine books and other sources of information to see what is already known, |
| | 4. review what is known in light of empirical evidence, |
| | 5. plan investigations, |
| | 6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), |
| | 7. pose answers, explanations, or descriptions of events, |
| | 8. generate explanations that explicate or describe natural phenomena (inferences), |
| | 9. use appropriate evidence and reasoning to justify these explanations to others, |
| | 10. communicate results of scientific investigations, and |
| | 11. evaluate the merits of the explanations produced by others. |
| SC.912.N.1.3 | Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented. <i>Cognitive Complexity/Depth of Knowledge Rating: Low</i> |
| SC.912.N.1.7 | Recognize the role of creativity in constructing scientific questions, methods and explanations. <i>Cognitive Complexity/Depth of Knowledge Rating: Low</i> |
| SC.912.P.8.2 | Differentiate between physical and chemical properties and physical and chemical changes of matter. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i> |

MATH:

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| MA.912.A.2.2 | Interpret a graph representing a real-world situation. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i> |
| MA.912.S.3.1 | Read and interpret data presented in various formats. Determine whether data is presented in appropriate format, and identify possible corrections. <i>Cognitive Complexity/Depth of Knowledge Rating: Moderate</i> |
| | Formats to include: |
| | bar graphs |
| | line graphs |
| | stem and leaf plots |
| | circle graphs |
| | histograms |
| | box and whiskers plots |
| | scatter plots |
| | cumulative frequency (ogive) graphs |

Name:

Date: