Environmental Science and Applied Technology
7th/8th Grade California State Science Standards
Data Collection and the Air Quality Index (Newspapers in Education)

| Science Content to be Delivered | Through the Use of Technology |
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| Objective: Students will<br>• study the relationship between air quality and health<br>• create an informational brochure on the computer which includes Internet research on air quality and steps to improve air quality<br>• look at particulate matter under the microscope<br>• present data in brochure to class | • Introduce lesson on the interactive whiteboard with the objectives<br>• Toggle between document camera, computer, and microscope<br>• Use the reveal feature to introduce each objective<br>• |
| Introduction: How many of you suffer from asthma? Discuss the relationship between the air quality index and suggested outdoor activities | Place the weather section of the newspaper under the document camera, use the zoom feature and select the Averbox to isolate the Air Quality Index Chart. |
| Instruct students how to make informational brochures on computers: content to include graphics of AQI, ozone, links to websites, and captured pictures from particulate matter lab | • Use Numbers from IWorks to create brochure.<br>• Capture steps onto the Smartboard's Notebook feature<br>• Capture the AQI from the newspaper with the document camera access the memory and include image on brochure |
| • Conduct experiment to collect particulate matter over time<br>• Compare and contrast (continuous capture) | • Use the continuous feature on the document camera to project data from experiment<br>• Connect to light microscope to capture images<br>• Use the split screen and side by side feature to make comparisons<br>• Use USB microscope and the document camera to capture images<br>• Compare |
| Share project with class | Put the tools into the hands of the students and allow them to project their printed reports within the class or share by usingthe network feature. Students can use the thumbnail feature to toggle between |

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| | images. Students may also use the picture in picture when sharing comparisons |
| Student Products:<br>• Brochure<br>• Graphs and charts<br>• Digital and captured images<br>• Lab Results<br>• Oral presentations | • Document camera, microscope, computers, whiteboard, digital camera to record presentation. USB microscope |
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**Investigation and Experimentation**

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
    a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
    b. Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.
    c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
    d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
    e. Communicate the steps and results from an investigation in written reports and oral presentations.

**Investigation and Experimentation**

9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
    a. Plan and conduct a scientific investigation to test a hypothesis.
    b. Evaluate the accuracy and reproducibility of data.
    c. Distinguish between variable and controlled parameters in a test.
    d. Recognize the slope of the linear graph as the constant in the relationship y=kx and apply this principle in interpreting graphs constructed from data.
    e. Construct appropriate graphs from data and develop quantitative statements about the relationships between variables.
    f. Apply simple mathematic relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including speed = distance/time, density = mass/volume, force = pressure × area, volume = area × height).
    g. Distinguish between linear and nonlinear relationships on a graph of data.