TRANSPIRATION

NGSSS:

1. ***SC.8.N.1.1*** Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
2. ***SC.8.N.1.2:*** Design and conduct a study using repeated trials and replication.
3. ***SC.8.N.1.3:*** Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim.
4. ***SC8.N.1.6:*** Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.
5. ***SC.8.L.18.1:*** Describe and investigate the process of photosynthesis, such as the roles of light, carbon dioxide, water and chlorophyll; production of food; release of oxygen.

COMMON CORE:

CCSS.ELA-Literacy.RST.6-8.3
Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CCSS.ELA-Literacy.RST.6-8.4
Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
CCSS.ELA-Literacy.RST.6-8.7
Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CCSS.ELA-Literacy.RST.6-8.9
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

OBJECTIVES: Students investigate transpiration in a plant. They use the humidity sensor to record data on a plant's environmental conditions inside a closed system define transpiration and explains where it occurs. They also describe how a plant can control the rate of transpiration and explain different environmental conditions that affect the rate of transpiration.

SKILLS:

- Students gain experience conducting the following procedures:
- Setting up equipment and work area to measure the change in humidity and temperature.
- Measuring humidity and temperature over a 24-hour period.
- Use math skills to interpret and analyze data

MATERIALS:

- Eurosmart datalogger
- Humidity sensor
- Temperature sensor
- Gallon size self-sealing bag
- Small potted plant
- Aluminum foil
- Water
- Tape

DRIVING QUESTION: *What happens to a living plant throughout the day and night?*
LAB SUMMARY: Students will wrap the base of a plant so that the soil's water does not evaporate and can be taken up only by the plants roots. They will place the wrapped plant into the bag along with the temperature and humidity sensor. They will seal the bag and tape as necessary. They will put the plant in a sunny location and record the temperature and humidity every two minutes over a 24 hour period. Students will analyze their graphs and determine when plants transpire more and discuss how the plant avoid losing too much water. They may also discuss what environmental conditions control water loss in plants.