Lesson 3: Graphing Temperature

Content: Science and Math

PLANNING PHASE

Performance Objectives:
1. Students will be able to correctly read a thermometer.
2. Students will be able to recording temperature from various locations in the school and at home.
3. Students will be able to display data in a bar graph.
4. Students will be able to read, draw and interpret a temperature graph.

Lesson Outline
Overall Description:
The purpose of this lesson is to get the students familiar with collecting data and expressing them in temperature graphs.

National Standards: TESOL Standards
Oral and Written Language
Goal 1, Standard 3; Goal 2, Standard 1;

This lesson follows the Fairfax County Public Schools’ Middle School sixth, seventh and eight grade Program of Studies (POS), which expand the State of Virginia Standards for Learning (SOLs).

Standard 1: Students read and write a variety of forms
Benchmarks
MS 1.2. Students read and write for a variety of purposes.

Standard 2: Students use strategies to construct meaning when working with language.
Benchmarks
MS 2.4 Students use collaborative leaning strategies

Virginia Science Standards of Learning / Benchmarks, Indicators

6.1. The student will plan and conduct investigations in which
   a) precise and approximate measures are recorded;
   b) data are organized and communicated through graphical representation (graphs, charts)

TEACHING PHASE

(1) Preparation
Warm-Up Activity:
- The warm-up activity will focus on reviewing the content of Lesson 2. Students share their homework handout in a small group. They collected data of evening and morning temperatures inside and outside their homes.
Cooperative Strategy: Share results with small group/ class

Language Goals
Students will learn how to work in a cooperative group, listen to the answers of his peers, and share them with the class.

(2) Presentation

a. Activity 1: Collecting Temperature Data
- New vocabulary: data table, bar graph, analyze, conclude
- Teacher tells students that they will be able to use their thermometer and collect temperature from 8 different locations in the school.
- Students pair up, and each pair is assigned a location (e.g., cafeteria, upstairs, hallway) where they have to collect data temperature.
- Teacher passes out student handout (see appendix)
- After students return the data is collected on a transparency in a data table. Students copy information on their data table handout. Teacher explains that data tables are rectangular, grid-like organizational tools, in which to record quantitative information

b. Extension: Activity 2: Displaying the data in a bar graph
- Teacher explains that they will display class data from the data table in a graph. She explains that a graph is a visual display of data. Teacher models how to shade in collected data. She further points out that each graph has a title; the locations are posted on the x-axis, the temperature on the y-axis, they have to be labeled and put into equal increments (Depending on the student knowledge of the coordinate system, teacher will modify and differentiate instruction)

Strategies: Working collaboratively with a partner. Teacher models expected student behavior, scaffolds steps.

Activity 3: Analyzing the graph
- Teacher models and scaffolds answers to the questions on the handout. Students are encouraged to infer and conclude. One possible conclusion is that heat rises and upstairs rooms are usually warmer than downstairs locations.

(3) Practice:
- Homework: Take home the thermometer and measure temperatures at eight different locations in your home. Record data on worksheet, draw a bar graph, analyze the data and conclude.

(4) Evaluation
- Informal performance evaluation based on working w/ partner, and class participation. Teacher will give feedback on handout and homework assignment.
(5) Expansion/Extension:
   - Introducing various forms of graphs: scatter plot/line graph, circle or pie graph.
   - Implementing a graphing checklist or rubric, so students can self-assess their graphing skills.

Four Skills Used in This Lesson:
1. **Listening Activity:** Students listen to teacher’s explanations of new concepts and to other students presenting their findings and temperature measurements.
2. **Speaking Activity:** Students discuss data with partner and participate in whole class discussions about data, temperature and graphs.
3. **Reading Activity:** Students read handouts, temperatures on a thermometer, data tables.
4. **Writing Activity:** Warm up activity (filling in the blanks); recording data on data sheet; answering questions when analyzing and concluding data on their handouts.

Methods/Approaches/Strategies
   - Warm Up: Tapping into prior knowledge, reviewing concepts of measuring temperature.
   - Cooperative Learning strategies are implemented throughout the lesson.
   - Teacher modeling of expected responses, scaffolds new skills (using a data table, designing a bar graph, analyzing and concluding)

Other Activities:

**Follow-up:** Passing out newspapers and having students cut out various graphs, explain what they display.

**Assessment:**
Assessment will be informal, based on classroom participation; teacher feedback on handout and homework.

**Homework (extension):**
See above, handouts

**Technology:**
   - Handouts will be displayed on an overhead transparency.
   - Computer clip art to design handouts

**Materials:**
   - Student handouts
   - Transparencies
   - A classroom set of thermometers
Books and Websites Used to Prepare Lesson Plan 3


Closure:
The teacher gives a quick summary of the lesson and asks the class to listen to other teachers using verbs *analyze* and *conclude* and share during the next class period.