ALBUQUERQUE and the Personal Computer Revolution

Peanut Butter and Jelly

Grade Levels: *4th – 8th*

Time Requirement: *Approximately 20 minutes to prepare and 60 minutes to complete.*

Objectives:

The student will:

- *Learn how write with precision*
- *Understand the concept of writing code for a computer*

Activity Summary:

Students will write specific and sequential steps for making a peanut butter and jelly sandwich. By doing so, they will improve their written communication skills and become familiar with the process of sequential thought.

New Mexico Standards:

Modern, Classical and Native Languages Content Standards 2, 5, 6, 7

Materials:

Paper, pencils or pens, peanut butter, jelly, bread, knife, paper plate, napkin

Background Information:

Computer programmers write detailed instructions for computers to follow. Known as algorithms, if these directions lack detail or are not sequential, the program may fail to operate as expected.

Procedures:

1. ***Prepare*** *for this lesson by gathering materials. Check for nut allergies and use margarine in place of peanut butter if necessary.*
2. ***What is software?*** *Creating software is like writing very detailed instructions for someone. Unlike the human brain, however, computers are incapable of "filling in the details." Therefore, it is important to remember that even the minutest steps must be included.*
3. ***Simple tasks may not be so simple.*** *Ask a volunteer to instruct the teacher to perform a simple task (e.g., open a door). The teacher should follow the student's instructions exactly. Did the student forget to include all of the necessary steps to complete the task? In other words, were there any "bugs" or errors in the "program?"*
4. ***What makes for good instructions?*** *Brainstorm the qualities that make for good instructions – they are sequential and detailed. Discuss the concepts of "saying what you mean" and "garbage in-garbage out." Explain that "garbage in-garbage out" is an expression that refers to the fact that computers, unlike humans, will unquestioningly process nonsensical input data and produce nonsensical output.*
5. *Explain that students will be writing a "program" for making a sandwich. Individually, students* ***write directions*** *for making a peanut butter and jelly sandwich.*
6. *One student* ***directs the teacher to make a sandwich****. The teacher follows each direction exactly, as though s/he has never before made a peanut butter and jelly sandwich.*
7. ***Review*** *as a whole class. Did the class end up with a peanut butter and jelly sandwich –or, in its place– an unopened jar of peanut butter sitting on top of a loaf of bread? What challenges were encountered when writing directions?*

Vocabulary:

Algorithm

Garbage in-garbage out

Extensions:

1. *Discuss how computer programmers (and others in business, economics, etc.) use flow charts as a way to visually represent a process, help people understand content between and discover if there are errors in that process. Steps in a flow chart are represented by different symbols (e.g., ovals signify the start or end, arrows show the sequence of steps, rectangles represent each step in a process, parallelograms indicate when there is an input or output of information). Draw symbols on chart paper next to their function and have students make a flow chart of the process of making a peanut butter and jelly sandwich, mapping each step in sequence.*
2. *Students write instructions for a more complicated task.*
3. *Students try out the "pizza run" interactive in the exhibition, Startup: Albuquerque and the Personal Computer Revolution.*

Modifications:

This lesson can be done with other simple, everyday tasks besides making a peanut butter and jelly sandwich.

Assessment:

- *Observation of students' comments and participation in class discussion*
- *Evaluation of sandwiches made*
- *Evaluation of written directions for making a sandwich*

References:

There are several versions of this lesson online. The following sites were referenced for this particular version:

www.waza-inc.com/inclusion/peanut_butter_and_details.htm

www.teachers.net/lessons/posts/2166.htm

Student Datasheets/Worksheets:

N/A