

VITAL INFORMATION

Subject(s): Careers, Computer Fundamentals 1-2

Topic or Unit of Study: Software Development

Grade/Level: 9-12

Objective: At the conclusion of this lesson students will be able to:

1. Name a variable using Hungarian notation and camel case.
2. Choose between integer and double data types.
3. Declare a variable (outside of a function definition).
4. Assign a value to a variable.

Summary: Students create a program to calculate their gross pay based on number of hours worked and an hourly rate. In doing this they employ (temporary) variables for the first time. In order to name their variables properly, they research the conventions used in Visual Basic, which are Hungarian notation and camel case (although this is slowly changing with .NET).

IMPLEMENTATION

Learning Context: We have discussed careers in the recent past and the idea of a paycheck should interest students. They have completed a calculator program, so they are familiar with the mathematics. However, students have never stored any information in variables (except as placeholders when calling functions). The exception is in their Scratch assignments, so reference should be made to those. Now is the time to explicitly use variables. They wouldn't normally be required in a program as simple as this one, but variables will be important for the next step: calculating pay when overtime is involved. That overtime paycheck program involves some if/then logic which is made much more convenient by variables. A more formal discussion of when and why to use variables is likely in the future.

Procedure:

1. Display for students the class web page where there is a screen shot of the paycheck calculator, a link to the video tutorial, and links to Wikipedia articles about Hungarian notation and camel case. Explain that the lesson is really about variables. So far they have used them in Scratch to remember old positions of sprites and in recent assignments to pass variables. There are other reasons to use variables, but these suffice for now. Variables are just names of places where information can be stored like mail goes in a mailbox, valuables in a safe, and so on. To find out what's in there, just use the name to

look inside. Ask for questions, because there will undoubtedly be some unforeseen misunderstanding.

2. Explain that they should complete the program and describe the two notation terms in their own words with at least five sentences each. This should be enough to get them started. Make sure that students who need headphones have them. The video tutorial does include sound.

3. When students feel they have finished the assignment, check their work based on the rubric below. The program should work for decimal pay rates, but will not work for fractions of an hour, since it was declared as an Integer in the video. Use a fractional hour to test understanding. Alert students may have already changed the integer declaration to a double. The handwritten work can be evaluated after hours.

Differentiated Instruction:

The tempo, volume, and size of the video tutorial can be changed. It does not have a transcript, however.

Sample Student Products:

The video shows the complete code. Students would only need to copy it. Descriptions of the two notational conventions will differ significantly between students.

Collaboration:

Students will work individually.

Time Allotment:

1 class period. 55 Min. per class.

Author's Comments & Reflections:

Reflections will follow in a diary entry.

Re. time allotment: This lesson is on the short side for a single class period. Any time left over can be used to synchronize the class.

MATERIALS AND RESOURCES

Instructional Materials:

We have a video tutorial for the lesson. I have made a web page for it and attached a PDF printout.

Attachments

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| 1. Regular Paycheck |
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Resources:

- Technology resources:
Visual Basic, Windows Media Player

STANDARDS & ASSESSMENT

Standards:

 **AZ- Career and Technical Education Programs**

- **Level** : Career Preparation (Grades 10 - 12)
- **Program** : Information Technology CIP No. 15.1200
 - **Option** : Software Development - Option C
 - **Competency** : *3.0 DEVELOP APPROPRIATE WORK HABITS FOR SUCCESSFUL EMPLOYMENT IN INFORMATION TECHNOLOGY

- **Indicator** : 3.3 Complete tasks accurately
- **Indicator** : 3.4 Complete tasks with minimal supervision
- **Competency** : *9.0 UTILIZE TECHNOLOGY REQUIRED IN AN INFORMATION TECHNOLOGY WORKPLACE
 - **Indicator** : 9.2 Demonstrate basic usage of computers such as input, storage, and output
 - **Indicator** : 9.5 Apply folder and directory management techniques
- **Competency** : 16.0 PARTICIPATE IN INFORMATION TECHNOLOGY WORK-BASED LEARNING EXPERIENCES
 - **Indicator** : 16.1 Use technology appropriate for a job in information technology
- **Competency** : 27.C DEMONSTRATE PROGRAM ANALYSIS AND DESIGN
 - **Indicator** : 27.4c Determine input and output
- **Competency** : 28.C USE SOFTWARE TO CREATE PROGRAMS
 - **Indicator** : 28.1c Enter and modify code using a program editor
 - **Indicator** : 28.2c Compile and execute programs
 - **Indicator** : 28.3c Correct syntax errors
 - **Indicator** : 28.5c Use recognized conventions for naming identifiers and formatting code
- **Competency** : 30.C WRITE CODE TO PERFORM ARITHMETIC CALCULATIONS
 - **Indicator** : 30.2c Interpret and construct mathematical formulas
- **Competency** : 34.C USE SIMPLE DATA TYPES AND STRINGS
 - **Indicator** : 34.1c Declare numeric, Boolean, character and string variables
 - **Indicator** : 34.2c Choose the appropriate data type for a given situation
 - **Indicator** : 34.4c Write assignment statements for initializing and modifying variables

Assessment/Rubrics:

Rubrics

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