



Java Module – Plan for Lesson Two

Lesson 2A – Intro to Data Types, Variables and Constants –Identifier Creation Rules, Range, Precision Limits – 6 days

- Objectives
 - In this lesson the student will understand the basics of standard data types, and how to create, initialize, declare, assign and output variables and constants.
 - The student will also gain an in-depth understanding of the numerical representations and limits of integers and decimals.
 - For all labs, students are encouraged to design the program on paper first, using problem-solving strategies to think through the purpose and goals of the problem, and identifying data types and objects needed to solve the problem.
 - New CS1 126.33 TEKS addressed.
 - C4A Use program design problem-solving strategies to create program solutions.
 - C4B Define and specify the purpose and goals of solving a problem.
 - C4F Design a solution to a problem.
 - C4G Code a solution from a program design.
 - C6L Understand the binary representation of numeric and nonnumeric data in computer systems.
 - C6M Understand the finite limits of numeric data.
 - C6O Choose, identify, and use the appropriate data types for integer, real, and Boolean data when writing program solutions.
 - CS1 126.33 TEKS revisited:
 - C2A Create and properly display meaningful output.
 - C2E Improve numeric display by optimizing data visualization (formatting).
 - C4D Identify the data types and objects needed to solve a problem.
 - C4H Identify and debug errors.
 - C4Q Develop program solutions that use assignment.
 - C4R Develop sequential algorithms to solve non-branching and non-iterative problems.
 - C6P Demonstrate an understanding of the concept of a variable.
- Suggested Lesson Sequence
 - Have students read through Lesson 2A and do the Practice Exercises.
 - *Note: There are 84 questions. Consider dividing up the assignment into sections, covering perhaps 20 or so questions per day.*
 - Work through the three labs:
 - Constants
 - Receipt Revisited
 - MIN/MAX
 - Administer Quiz 1 (versions A and B) over data types, identifier creation rules, and integer limits
 - Do Lab 2A2, the Receipt lab revisited, replacing literal values with variables and constants as indicated. Students should use their previous version of this lab and make modifications to it instead of starting all over again.
 - Administer Quiz 2 (versions A and B) over more about variables, memory storage, and valid identifiers
 - Do Lab 2A3 on maximum and minimum values of the integer data types
 - Administer the test on Lesson 2A (versions A and B)
 - Administer the Lesson 2A lab test on using variables and constants with the new indenting technique.



Java Module – Plan for Lesson Two (cont.)

Lesson 2B – Operations, Characters, Mixing Data Types, Order of Operations – 4 days

- Objectives
 - In this lesson the student will understand how Java operations work with the various data types.
 - The student will gain a more in-depth understanding of the char data type.
 - The student will also understand how to mix variable types and how the JAVA order of operations works.
 - The JAVA order of operations, PMMDAS is introduced and explored
 - New CS1 126.33 TEKS addressed.
 - C4E Identify reusable components from existing code.
 - C4O Demonstrate proficiency in the use of the arithmetic operators to create mathematical expressions, including addition, subtraction, multiplication, real division, integer division, and modulus division."
 - CS1 126.33 TEKS revisited:
 - C2A Create and properly display meaningful output.
 - C2E Improve numeric display by optimizing data visualization (formatting).
 - C4A Use program design problem-solving strategies to create program solutions.
 - C4B Define and specify the purpose and goals of solving a problem.
 - C4D Identify the data types and objects needed to solve a problem.
 - C4F Design a solution to a problem.
 - C4G Code a solution from a program design.
 - C4H Identify and debug errors.
 - C4Q Develop program solutions that use assignment.
 - C4R Develop sequential algorithms to solve non-branching and non-iterative problems.
 - C6P Demonstrate an understanding of the concept of a variable.
 - C6L Understand the binary representation of numeric and nonnumeric data in computer systems.
 - C6M Understand the finite limits of numeric data.
 - C6O Choose, identify, and use the appropriate data types for integer, real, and Boolean data when writing program solutions.
- Suggested Lesson Sequence
 - Have students read through Lesson 2B and do the Practice Exercises.
 - Go over the lesson and Practice Exercises together.
 - Do Lab 2B1 on using constants and variables to create and output a numerical expression.
 - Do Lab 2B2 on using the char data type.
 - Administer Quiz 1 (versions A and B) over Java operators, mixing data types, and ASCII values for characters.
 - Administer Quiz 2 (versions A and B) over more about operators and ASCII values.
 - Do Lab 2B3 on creating and outputting a mathematical expression involving decimal values, using printf to control the format.
 - Administer the test on Lesson 2B (versions A and B)
 - Administer the Lesson 2B lab test on using variables to calculate and output the circumference of a circle given the diameter.



Java Module – Plan for Lesson Two (cont.)

Lesson 2C – More Operations – 5 days

- In this lesson the student will
 - Continue the study of JAVA operations, exploring the concepts of reassignment, operation shortcuts, type casting, String conversion, division and modulus, and two Math class functions (pow and sqrt).
 - Receive a brief introduction to the while loop is also explored.
 - Learn about two types of data type errors (incompatible types and loss of precision).
 - Learn how to parse strings into integer and decimal values.
 - Study four computer numbering systems, decimal, binary, octal, and hexadecimal, know how to count to decimal 32 in each, and be able to convert between any two, twelve different conversions
 - New CS1 126.33 TEKS addressed.
 - C4P Create program solutions to problems using available mathematics libraries, including absolute value, round, power, square, and square root.
 - C6N Perform numerical conversions between the decimal and binary number systems and count in the binary number system.
 - CS1 126.33 TEKS revisited:
 - C2A Create and properly display meaningful output.
 - C2E Improve numeric display by optimizing data visualization (formatting).
 - C4A Use program design problem-solving strategies to create program solutions.
 - C4B Define and specify the purpose and goals of solving a problem.
 - C4E Identify reusable components from existing code.
 - C4D Identify the data types and objects needed to solve a problem.
 - C4F Design a solution to a problem.
 - C4G Code a solution from a program design.
 - C4H Identify and debug errors.
 - C4O Demonstrate proficiency in the use of the arithmetic operators to create mathematical expressions, including addition, subtraction, multiplication, real division, integer division, and modulus division.
 - C4Q Develop program solutions that use assignment.
 - C4R Develop sequential algorithms to solve non-branching and non-iterative problems.
 - C6P Demonstrate an understanding of the concept of a variable.
 - C6M Understand the finite limits of numeric data.
 - C6O Choose, identify, and use the appropriate data types for integer, real, and Boolean data when writing program solutions.
- **Suggested Lesson Sequence**
 - Have students read through Lesson 2C and do the Practice Exercises.
 - Go over the lesson and Practice Exercises together.
 - Do Lab 2C1 demonstrating all of the different mathematical operations.
 - Do Lab 2C2 on using Math.PI and Math.pow to calculate and output an expression regarding the area of a circle.
 - Do Lab 2C3 on calculating the side of a square given the area.
 - Administer Quiz 1 (versions A and B) over assignment statements, shortcut operations, the while loop, and IT and LOP errors.
 - Do Lab 2C4 dealing with birthdates.
 - Do Lab 2C5 on using the distance formula.
 - Administer Quiz 2 (versions A and B) over more about shortcut operators, Math class methods, and IT and LOP errors.
 - Do Lab 2C6 on calculating a NAAC (name-age-average character).
 - Administer the test on Lesson 2C (versions A and B)
 - Administer the Lesson 2C lab test on parsing strings into integer and decimal values.