Lesson objective: Intro to Integer Variables

Essential Question:

- What is a variable? Why are they useful?
- How do we create one?
- How do we give it a value?
- How do we change the variable value?

Unit Context:
- This lesson would happen very early into teaching about coding in Java, probably day 2 or 3.
- Previous skills required for success in this less
    - Create a java file using a template (replit ?)
    - Compile and Run that program
    - How to print to the console (System.out.print(); System.out.println();
    - Some very basic understanding that the lines of code are run sequentially.
    - How to add comments to code using //

Aim:

Warm up

Think-Pair-Share:
How many phone numbers do you have memorized?
How many phone numbers do you have as contacts on your phone?
Are there other numbers you can refer to by name, but do not have memorized? (student ID number, social security number, driver's license number …)

Time: 5 min

Lesson Content

<u>Define variable discussion:</u>
- Relating back to warm up, what do you think a variable is?
- How is this similar to how you use "variables" in math class?
 int mom = 5551235482;
- Change #?
int mom = 2121235931;

<u>Data Types Discussion?</u>
- Integer variables can only store data of that data type, integers (positive or negative whole numbers). It cannot store words, characters, or decimal numbers.
- There are other data types, (boolean, string, character, array, …) that we will get to in future lessons.

Code Demo, Code-along

- Show examples of how to create an integer variable in java.
    a) Name (“declare”) it in one line and assign it a value in another:

```
int score;
score = 4;
```

    b) Declare and assign in the same line:

```
int score = 4;
```

- It is important to understand that this “=” is NOT stating that both sides of the equation are equal, instead it is assigning the variable on the left to the value on the right.
- We should read this as “scores gets the value 4” or “score is assigned a value of 4” or “

- We can re-assign the variable to a new value:

```
score = 5;
```

- Changing a variable by referencing it:

```
score = score + 2;
```

    - This is where it can get tricky, think of this as “set score to the value of what score was plus 2.
    - In algebra class this statement would be impossible, but in java it is a very common way to change a variable’s value.
    - here is full example:

```
int number = 4;
number = number + 9;
System.out.println(number);
```

-Conventions for naming variables

    - Must start with a letter and only include letters, numbers and underscores “_”
    - You canNOT use any of the keywords or reserved words as variable names in Java (for, if, class, static, int, double, etc), you’ll learn more about these as we go.
    - It is good coding practice to name the variable something that is meaningful for what the variable represents.
    - It is most common in java to start variable names with a lowercase letter and use camelCase if there are multiple words.

Resources
1.3.2: Data Types
1.3.3: Declaring Variables
https://runestone.academy/ns/books/published//csawesome/Unit1-Getting-Started/topic-1-3-variables.html#declaring-variables-in-java

time:

Lesson Activity

Time:

Brief notes:

Error Detector:
- What is wrong with each section of code. Work with your partner to find the mistake and correct it. After correcting it add a comment "//" explaining what was wrong.

```
//A
age = 16;
int age;
System.out.println(age);

//B
int firstName;
firstName = "Lisa";
System.out.println(firstName);

//C
int math grade = 95;
System.out.println(math grade);

//D
int money = $3.50 ;
System.out.println(money);
```

A: the variable needs to be declared before it is assigned, switch order of first and 2nd lines.
B: Lisa is a string not an integer
C: You cannot use a space in
D: $3.50 is not an integer, it cannot have the $ or the decimal (* it would round the decimal)

Create your own Program

In pairs, students will create a program to record the scores of each team in a paper football game.

1. *Create variables that represent 2 different teams' scores.*
2. *Assign a value of 6 to Touchdown, as each touchdown is worth 6 points!*
3. *Assign the value of 1 to Extrapoint, as each kick is worth 1 point!*
4. *Update each team's score without using the actual integer.*

Skeleton code with 4 variables
Team_1_score
Team_2_score
 int Touchdown =
int Extrapoint =

Students will assign values to this variables and then update Team_1_score and team_2_score using the variables touchdown and extra point and not using literals

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Closing:

Code Demo looking at an Phonebook app that store a contacts number and email that can be identified from their name

(SEE attached Phonebook.java)

Time: 2 minutes