

Coding Concepts and Vocabulary: VARIABLES

<https://www.youtube.com/watch?v=xjZDZ1TJe4o>

Variables are named place-holders and have changeable values. Those values can be text or numbers. Variables are kind of like a container that will hold new information for you until you are ready to use it. Kind of like the “x” that you have to solve for in math... ($x = 5 - 3$, so $x = 2$)

Variables are great to use in coding if you don't know the information yet and are waiting for a user to supply it.

Variables can store number values: for instance if your program draws shapes, it can ask the user “How many sides do you want this shape to have?” the variable will hold that number and use it to draw the shape, then when the user enters a new value, the new value is used.

Variables can also store text or “string” values: for instance, have you ever played an online game that asked you your name, and then used your name later in the game to “chat” with you?

This is kind of how that worked:

Game code has a block or line of code that creates and names a space to save some information. The space is named ‘player’ and to begin with, the space is empty, so player equals nothing. (player=0)

Game asks the player: “What is your name?”

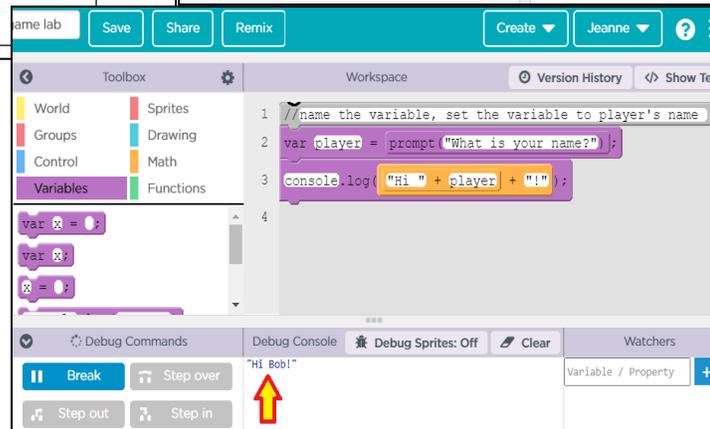
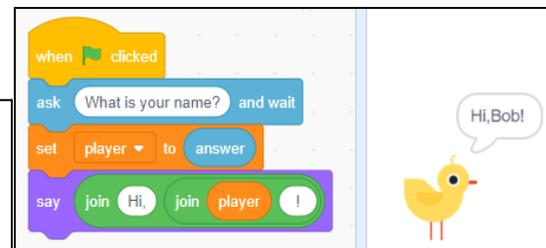
The player types their name: “Bob”

The game code then changes (or ‘sets’ the value of player from [player = 0] to [player = Bob].

Game code line says “Hi, {player}! And since player = Bob, the player sees “Hi, Bob!” on the screen.

```
1 player = input("what is your name? ")
2 print ("Hi, "+ player + "!")
```

```
What is your name? Bob
Hi, Bob!
```



Once the variable has been set, you can use it many times in the program. You can even have the code respond in a different way depending on the input or response the user/player enters! (These are called “Conditional” statements because they place conditions on the code, giving it ‘choices’.

Here you can see a complicated conditional statement.

So, **if**, a condition exists (player = Bob) [then] print some stuff on the screen (console)

But, **else if** a different condition exists (player=HarleyGhost) [then], print some other stuff

But... else - if NEITHER of those conditions exist, [then] print totally different stuff.

```
1 player = input("what is your name? ")
2 print ("Hi, "+ player + "!")
3
4 if player == "Bob":
5     print("We love Bob!")
6 elif player == "HarleyGhost":
7     print ("Boo!")
8 else:
9     print("I don't want to play without Bob.")
```

```
What is your name? Bob
Hi, Bob!
We love Bob!
```

```
What is your name? HarleyGhost
Hi, HarleyGhost!
Boo!
```

```
What is your name? KittyCat
Hi, KittyCat!
I don't want to play without Bob.
```

The variable could also be a number and can be used to keep score or do math or tell the code how many times to repeat or how far to move or how many degrees to turn or... you get the idea!

With a game, it could work like this:

- Game code has a block or line of code that creates and names a space to save some information.

- The variable (space) is named 'score' and to begin with, the space is empty, so score equals nothing. (score=0)
- Game wants the player to start out with 10 points, so at the start of the code, the game code sets the value of score to 10 [set score to = 10]
- Whatever the objective of the game is - for the player to get the answer correct or click on the correct object, or catch the asteroid... etc...
- The code must continually ask if the specific condition was met...

Did the player get the asteroid? (no) Did the player get the asteroid? (YES!!)

If "YES" then the code adds 10 more points!

The variable "score" changes because it is now equal to: the old value of score + **10**.

And so on!

<https://scratch.mit.edu/projects/774041262>