Variables Activity 1

Scratch is great at making cool sounds. You can *change* the tempo, volume, and pitch. In this activity, we’re going to use variables to *change* these values to create effects like faders.

In particular, notice that:

* Whenever we use a variable, we *set* it to a particular value at the top of the program
* Once the variable is set, we can *change* it throughout the rest of the program

Assignment:

A screenshot of a phone

Description automatically generatedFirst, we’re going to experiment with variables. Create a new variable named volume. Then, create a program exactly like the one seen below:

1. Before you run the program, what do you think will happen when the green flag is clicked?
2. Now run the program. Was your prediction correct? If it wasn’t, explain what was wrong.
3. What would happen if you set the volume to 0 initially then change it by positive 10?
4. Why is it important to have a set at the beginning of the loop? How is this similar to having a good “init” in a game loop?
5. What would happen if you had a set in the loop rather than a change?
6. What would happen if you set the volume to 0 initially then change it by positive 20?

Second, we’re going to create a program that uses a variable to play a bunch of different notes. Create a new variable named note. Then, add the music extension (next to the pen extension) to get the required blocks. Finally, create a program exactly like the one seen below:

A screenshot of a phone

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1. Before you run the program, what do you think will happen when the green flag is clicked?
2. Now run the program. Was your prediction correct? If it wasn’t, explain what was wrong.
3. What would happen if you put a forever loop around the two repeat loops?

Third, I want you to create a band of **three** sprites. Each of the sprites must change **at least one variable** to alter some part of the sound. For an example, check out my “hot cross buns” band: <https://scratch.mit.edu/projects/945203816>. Note: Unless you’re very musical the results will likely sound bad.

1. Create three sprites.
2. Program the first sprite to use a variable to change some part of the sound within a loop.
3. Program the second sprite in the same way as the first.
4. Program the third sprite in the same way as the first and the second.
5. Sit back and enjoy the horrible music!

Bonus: Now that you know how to use variables, create a new scratch project that uses them tastefully. Look online for inspiration in terms of songs and notes. Then, create a program that makes some beautiful music using a variable or two.