Scratch Translation Lesson Notes

*Below are some **optional** lesson plans that can be used as a scaffold for teachers who want to explicitly link Scratch and Arduino.*

Days 13-18: Interactive Mural
- o Show students "grade solution.sb" from Scratch (Unit 4 day 16) and refresh their memories that the project displays a letter grade based on a percentage input by the user.
    - ▪ Remind them that the variable "grade" was created in Scratch to hold a number. This is similar to how variables are declared in the Naming Section of their Arduino programs.
- o In pairs, have students complete #1 of TranslatingGrade.pdf.
    - ▪ When finished, students share answers with the class.
- o Create a side-by-side comparison of blocks from Scratch and the corresponding Arduino code.
    - ▪ "_ and _" block in Scratch is "&&" in Arduino
    - ▪ "_ or _" block in Scratch is "||" in Arduino
- o Tell students that the symbols for ">" and "<" are the same in Arduino as they are in Scratch.
- o If students need more modeling, demonstrate how to write the first "if" statement as a class.
- o Student pairs complete rest of TranslatingGrade.pdf.
- o Have students share translated code.
    - ▪ See TranslatingGradeSolution.pdf.
- Review of nested conditionals
    - o Show students "rps solution.sb" (Unit 4 day 18) and refresh their memories that the code determines if the computer or player wins depending on their combination of rock, paper, or scissors.
        - ▪ Remind them that the variables "computer", "player", "ROCK", "PAPER", and "SCISSORS" were created in Scratch to hold values. This is similar to how variables are declared in the Naming Section of their Arduino programs.
    - o In pairs, have students complete #1 of RPSCompare.pdf.
        - ▪ When finished, students share answers with class.
    - o Student pairs finish RPSCompare.pdf.
    - o Go over [RPSCompare.pdf.](RPSCompare.pdf)
        - ▪ Display handout in front of class and fill it in as students share answers.
        - ▪ Emphasize that the two solutions do the same thing.
        - ▪ Review the flow of logic in Version 2.
            - Trace through the following conditions and show how each say block is reached:
                - o "computer = ROCK" and "player = ROCK"

- o "computer = ROCK" and "player = PAPER"
- o "computer = ROCK" and "player = SCISSORS"
    - Note the condition where player equals SCISSORS is not explicitly mentioned. It is caught by the "else".
  - Show how the condition where "computer = SCISSORS" and "player = PAPER" doesn't fall into any of the conditions in the code excerpt.
- o Add to side-by-side comparison of blocks in Scratch and the Arduino code:
    - "_ = _" block in Scratch is "==" in Arduino.
      - In Arduino, "==" is used to ask if two things are equal and is different than "=" which is for assignment (saving values in variables).
    - Scratch also has a "not _" block. In Arduino, "!" is "not" and "!=" is the symbol that means "not equal to".
- o Have students complete TranslateRPS.pdf.
    - Remind students that in Arduino the "{" is the beginning of the "if" statement and the "}" is the end of the "if" statement.
- o Review solutions to TranslateRPS.pdf.
    - See TranslateRPSSolution.pdf.