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FOR LOOPS

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CAN I GET A COPY OF THESE SLIDES? YES, PROBABLY…

Most presentation lecture slides can be found indexed on www.steamclown.org and maybe blogged about here on Jim The STEAM Clown's Blog, where you can search for the presentation title. While you are there, sign up for email updates

If you are on of my SVCTE Mechatronics Engineering Students, Look here on the SVCTE Mechatronics Engineering Blog: https://svctemechatronics.blogspot.com/

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RESOURCES & MATERIALS NEEDED

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NEW WORDS OR CONCEPTS...

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FOR LOOPS

- The for statement is used to repeat a block of statements enclosed in curly braces

```
for (loop parameters and conditions)
{

}
```

- An increment counter is usually used to increment and terminate the loop
- The “for” statement is useful for any repetitive operation

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Loop Examples -Dental Checkup

- There are a finite number of teeth, and the dentist checks each one in turn for cavities and gum disease
- What are the steps?
  - Does the Dental Hygienist clean each tooth one at a time?
  - Is there a process? That maybe has “loops”

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Dental Check Up - Possible Steps

- Get patient data
- Clean front of teeth
  - Left top side
    - Start at back, move to center
      Clean front of each tooth
  - Right top side
    - Start at back, move to center
      Clean front of each tooth
  - Left bottom side
    - Start at back, move to center
      Clean front of each tooth
  - Right bottom side
    - Start at back, move to center
      Clean front of each tooth
- Clean Back of teeth
  - Left top, Right top, Left bottom, Right bottom
- Clean Top of Teeth
  - Left top, Right top, Left bottom, Right bottom
- Floss
  - Left top, Right top, Left bottom, Right bottom
- Polish Teeth
  - Left top, Right top, Left bottom, Right bottom

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Looping in a Science Lab

- Your boss asks for 20 flasks of a solution
- You get the first flask, add water, add the solute, put the flask away from the empty ones, repeat the same procedure for every flask
- Do you have to change something if there are 30 flasks? 100?
- If you use a different solute, do you have to change a lot in this procedure?

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Height, Hair, Eyes…

- We want to compute the average height and the distribution of hair and eye colors of the class
  - Call you up 1 by 1, and ask your Height
  - Call you up again 1 by 1 and ask your hair color
  - Call you up again 1 by 1 and ask your eye color

What is a better way than using 3 loops?

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Use a loop and do stuff together

- Get number of student in class
- Call you up 1 by 1, until all students have come up
  - studentCount=studnetCount+1
  - Ask for height
  - totalHeight = totalHeight+height
  - Ask hair color
    - If (hair = blue) {hairBlueCount = hairBlueCount+1
  - Ask eye color
    - If (eye = blue) {eyeBlueCount = eyeBlueCount+1
  - averageHeight= totalHeight/ studentCount
  - Print data

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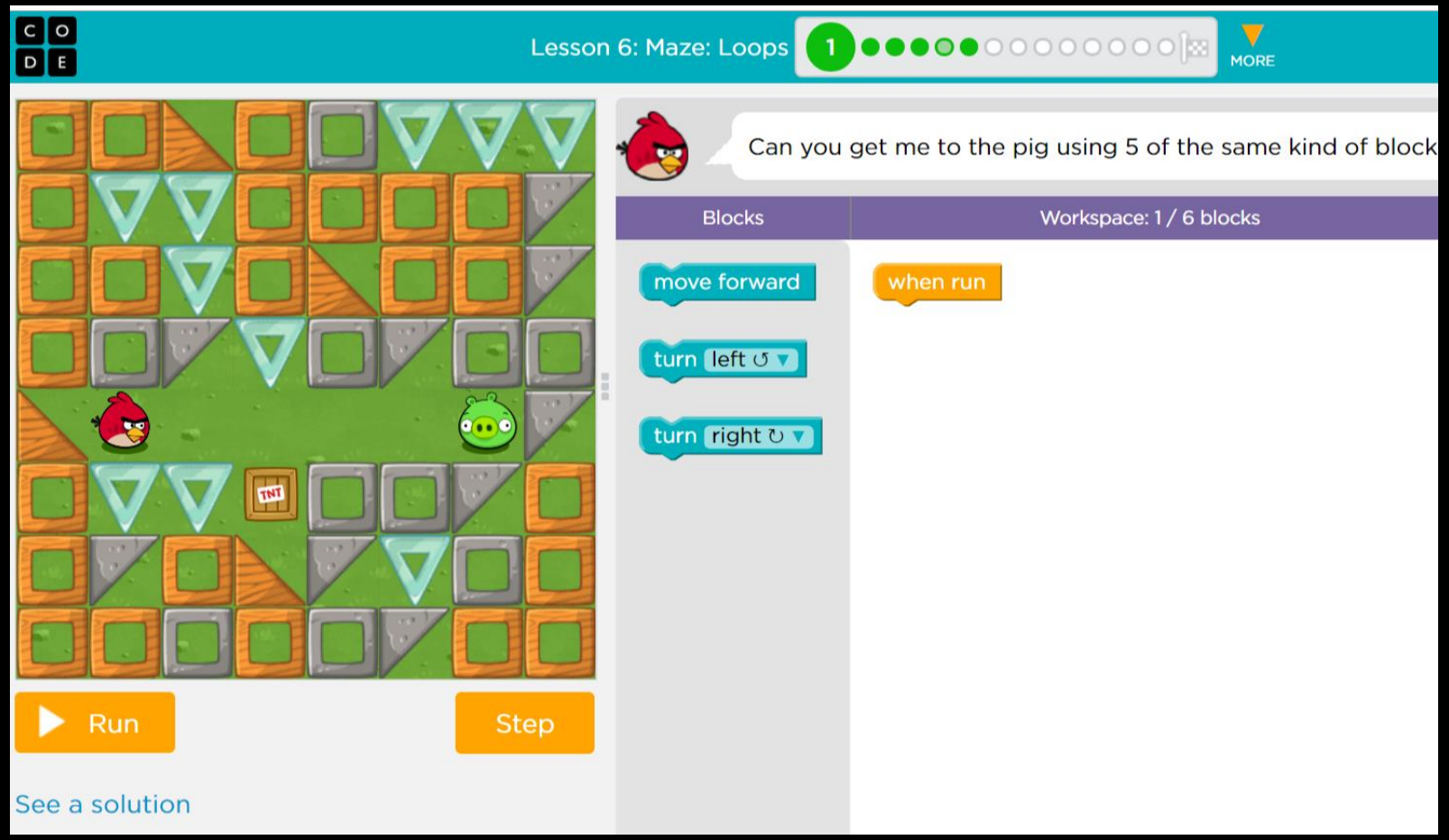
LOOPS WITH CODE.ORG

- https://studio.code.org/s/course2/stage/6/puzzle/1



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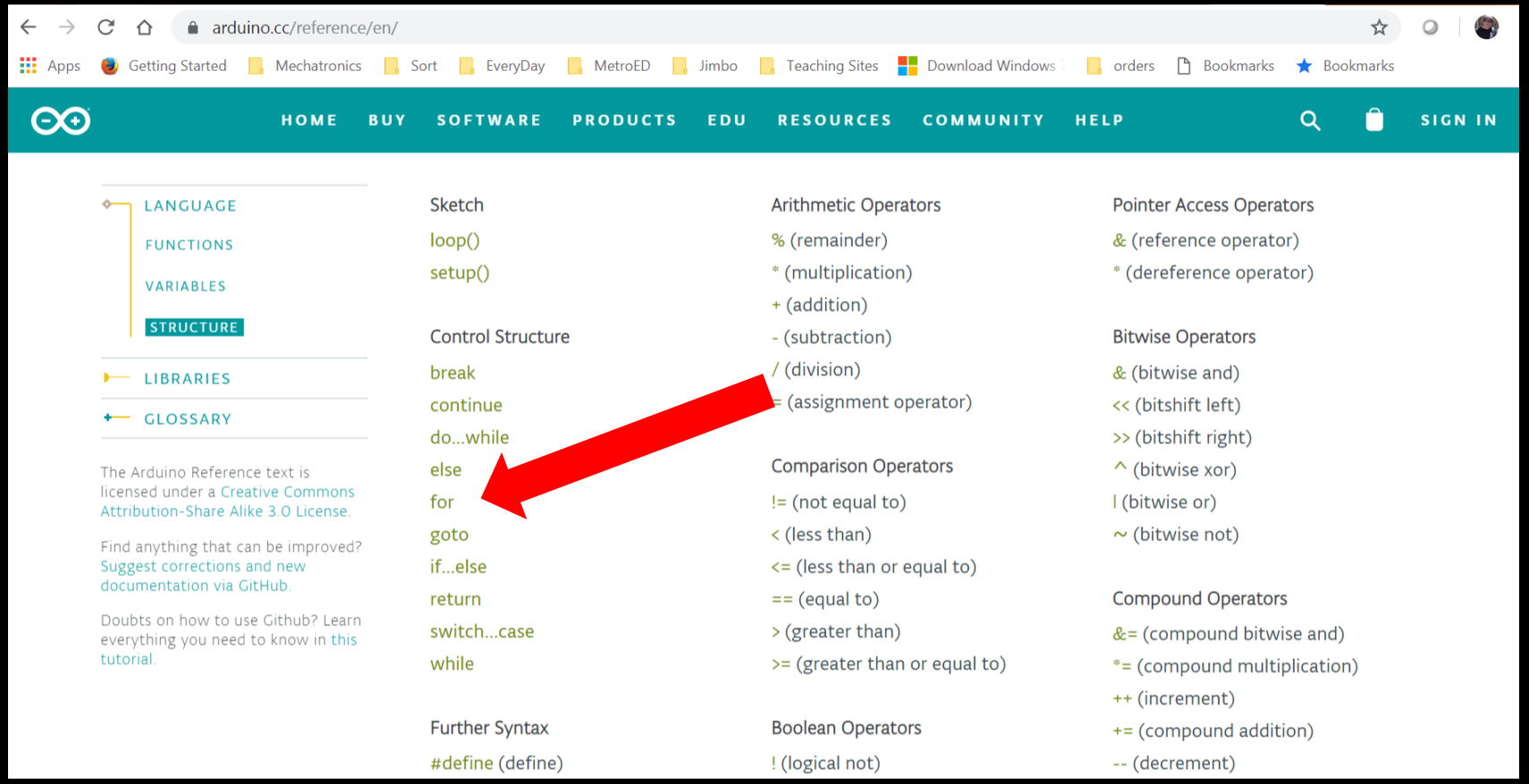
Arduino.cc under "Resources"

- Arduino.cc For Loop Reference Link



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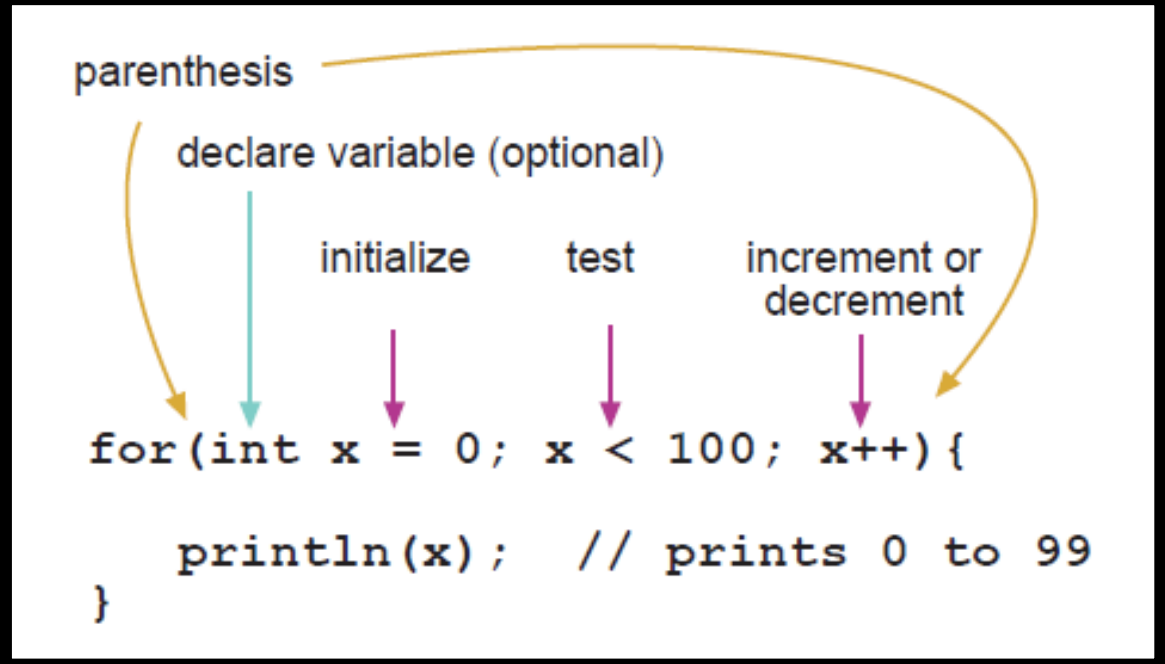
FOR LOOP STATEMENT

- Loop “for” some time…
  - What does this code do?
  - Why would you use code like this?
- Github Examples
  - forLoop_STEAMClown
  - pushbutton_LED_2_STEAMClown




```
for (int i = 0; i < 20; i ++)
 {
  digitalWrite(ledPin, HIGH);
  delay(delayPeriod);
  digitalWrite(ledPin, LOW);
  delay(delayPeriod);
 }
```

```
for(int x = 2; x < 100; x = x * 1.5)
{
println(x);
}
```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Lab Time – For Loop & Embedded If/Else If

- Open a new Arduino sketch and copy the putYourCodeHere Template from Github
- Review these slides and the Arduino.cc Resources page for "For Loops"
- Write a sketch that uses a for loop that counts to 20
  - Prints the loop variable each time it loops
  - Prints "the loop is equal to 10" when the loop counter == 10
  - Prints "the loop is less that 10" when the loop counter is less than 10
  - Prints "the loop is more that 10" when the loop counter is more than 10

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REFERENCE SLIDES

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APPENDIX

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- My best attempt to properly attribute, or reference any other images, sources or work I have used are listed in Appendix B

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Appendix B: Attribution for Sources Used

- https://software-carpentry.org/blog/2015/12/teaching-for-loops.html
- While loop video https://www.youtube.com/watch?v=RtAPBvz6k0Y

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