

The background of the slide is a light gray color. It features several wavy, dashed lines in a light tan or gold color that flow across the page. In the bottom right corner, there is a solid red line that curves upwards and to the right. There are also two white circular shapes: one in the top left corner and another in the bottom right corner, partially obscured by the red line.

Variables & Loops

AP Computer Science Principles

Do Now

Analyze the algorithm.

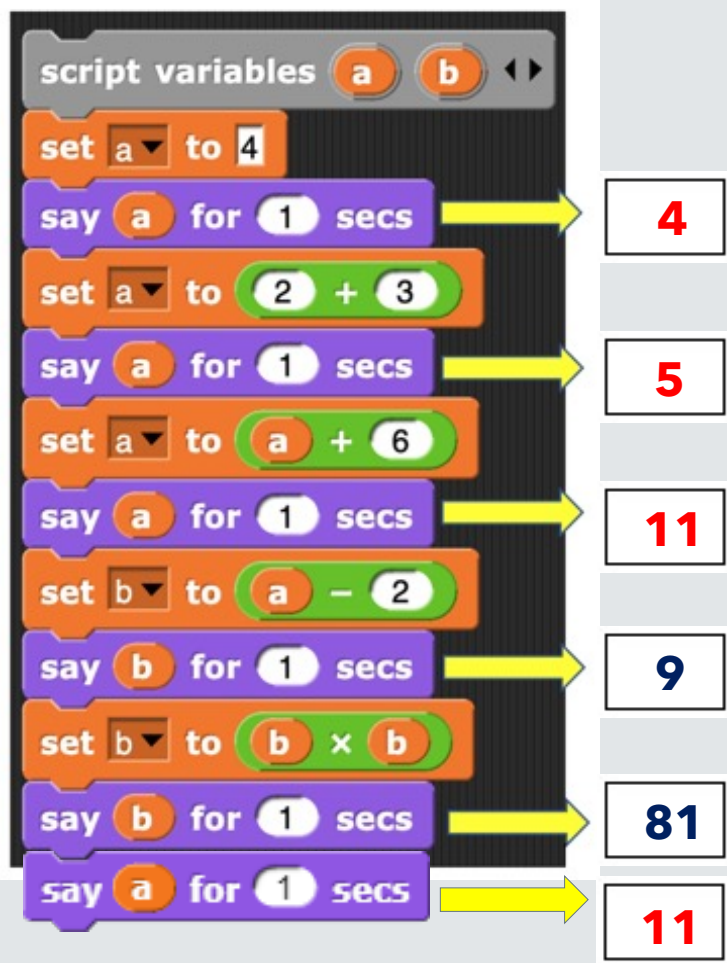
Predict what the sprite will say for *each* of the **say** statements.

Fill in the boxes below with your predictions.

The image shows a Scratch script with the following blocks:

- script variables **a** **b**
- set **a** to 4
- say **a** for 1 secs → **4**
- set **a** to $2 + 3$
- say **a** for 1 secs → **5**
- set **a** to $a + 6$
- say **a** for 1 secs → **11**
- set **b** to $a - 2$
- say **b** for 1 secs → **9**
- set **b** to $b \times b$
- say **b** for 1 secs → **81**

Yellow arrows point from the 'say' blocks to the prediction boxes on the right. The prediction boxes contain the values 4, 5, 11, 9, and 81.



What if we added the block **say a for 1 secs** at the end of the script?

What will the sprite say for that command?

| Value of "a" | Value of "b" |
|-------------------------------------|--------------|
| 4 | |
| 5 | |
| 11 | |
| Value of "a" has not changed since! | 9 |
| | 81 |

What is a variable?

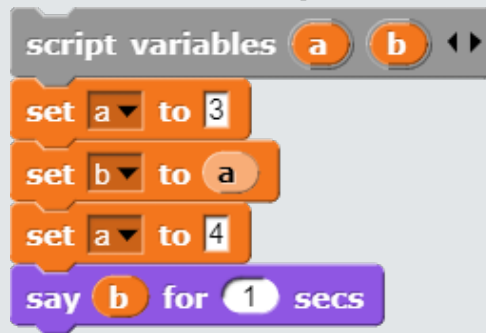
- + A **variable** is like a box that can hold one value at a time, such as one word, one costume, or one list (which can contain many things). You can look at what's inside as many times as you want.



- + When you give something a name, you can refer to it without knowing exactly what the value is.

What value will this script display?

In Snap:



In pseudocode:

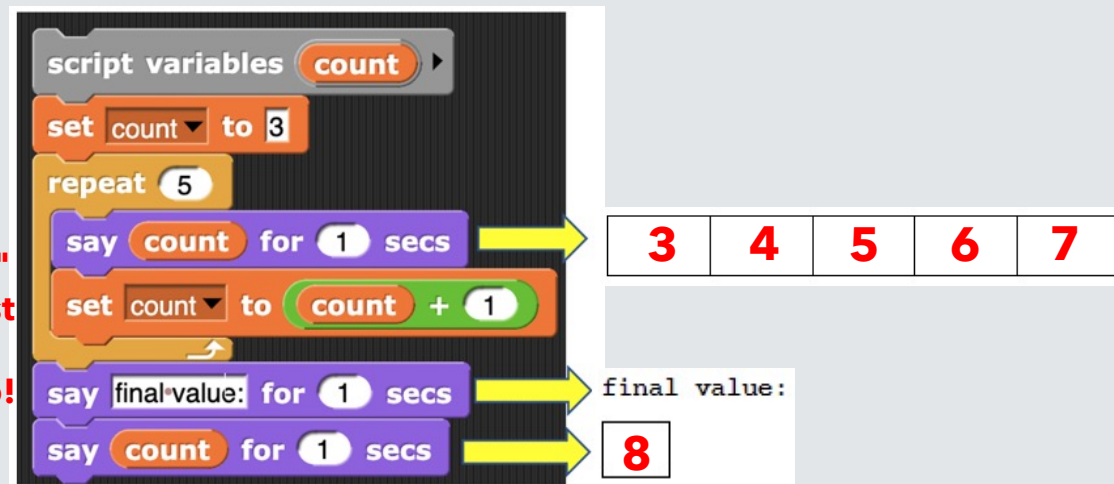
```
a ← 3  
b ← a  
a ← 4  
DISPLAY(b)
```



- + When you assign a value to a variable, the variable holds that value, not where it came from.
- + "b" will not change its value even when "a" changes

What value will running this script display?

Value of "count"
changes one last
time before
exiting the loop!



Here, the loop repeatedly reassigns a value to "count"

U2L0

Variables & Looping

Goals:

- Trace variables as their values are reassigned with and without loops
- Create art with loops and variables

Things to look out for:

- + Pencil and paper are **very** helpful when tracing code.

| Value of "a" | Value of "b" |
|--------------|--------------|
| | |
| | |

- + Even if you're not sure, make your best guess **THEN** try it out in Snap.

- + Checkpoint: Google Form embedded in lab

