**Title: Tell Me How to Function**

**Important Questions:**

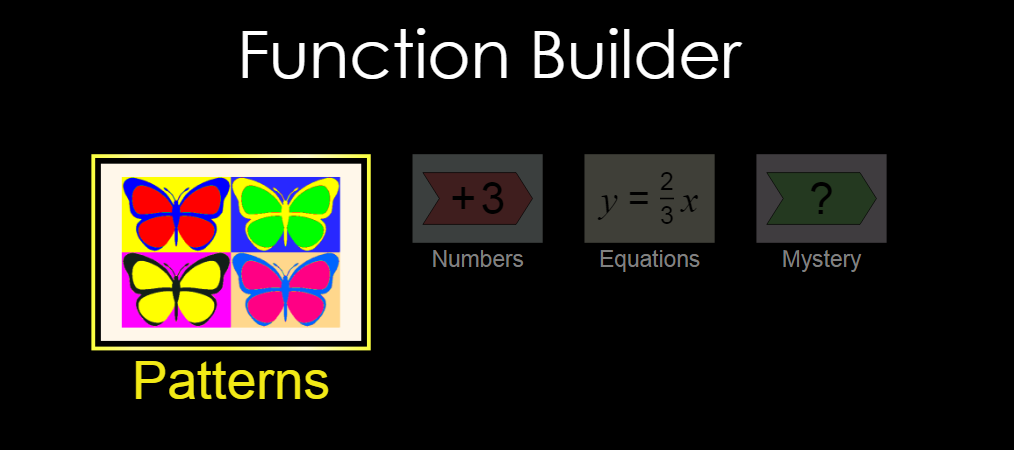
* What is the difference between the input and output?

#### What is a function? How does it affect the input and output?

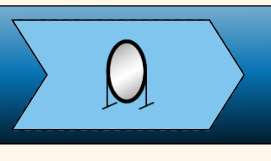
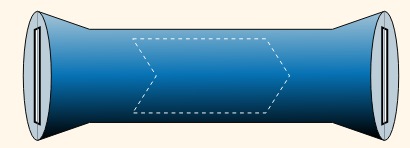
**Instructions:**

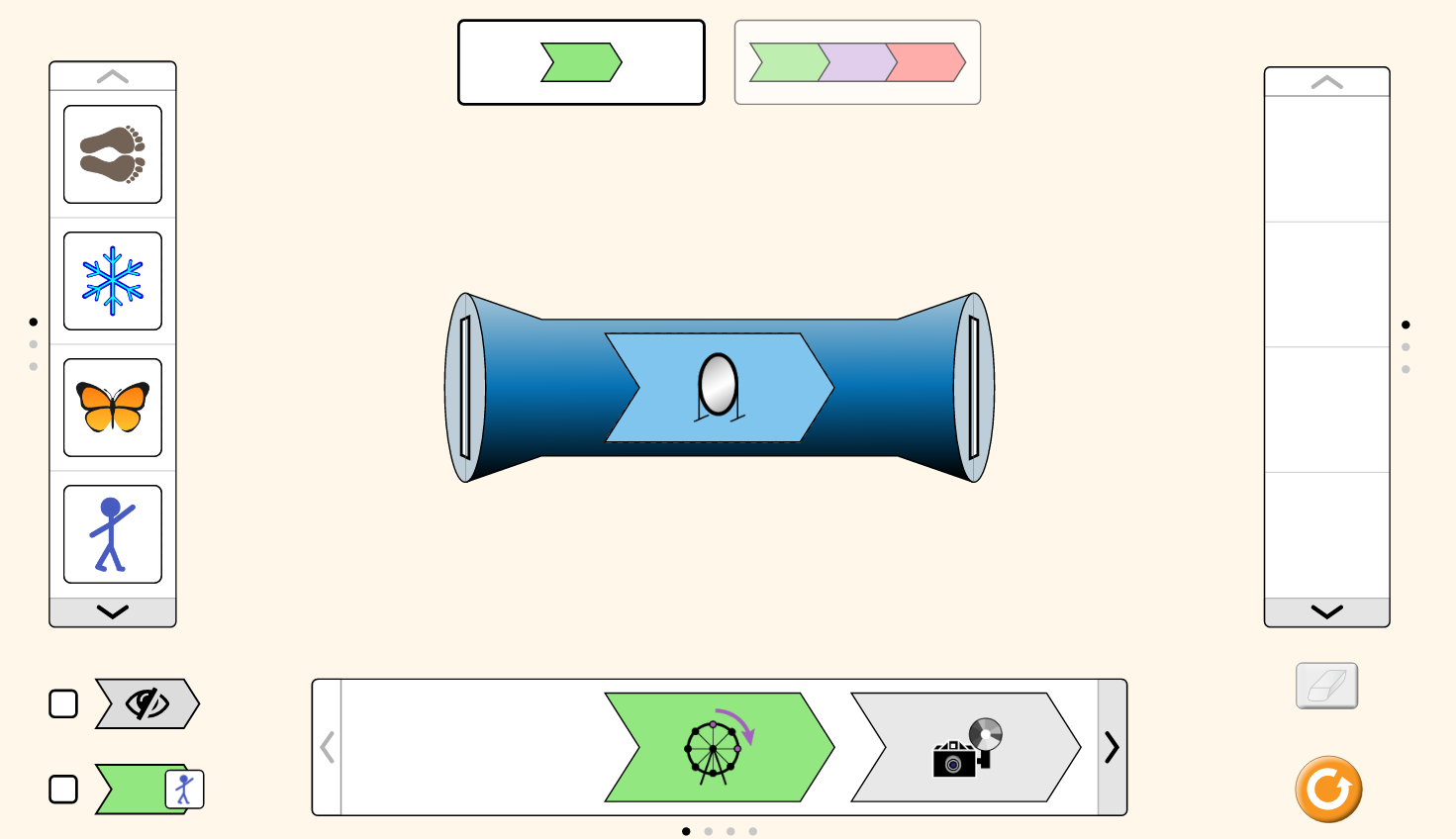
In this activity, the above questions are investigated. Complete this document by filling in data tables and writing complete responses. This investigation has three phases: Exploration, Explanation and Application. Work between this document and the simulation (sim).

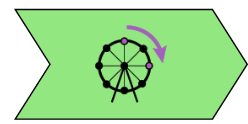
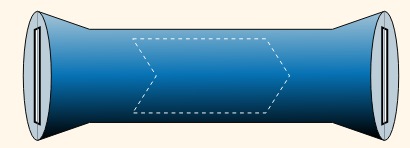
1. Click this screen shot below to open the “Function Builder” simulation.

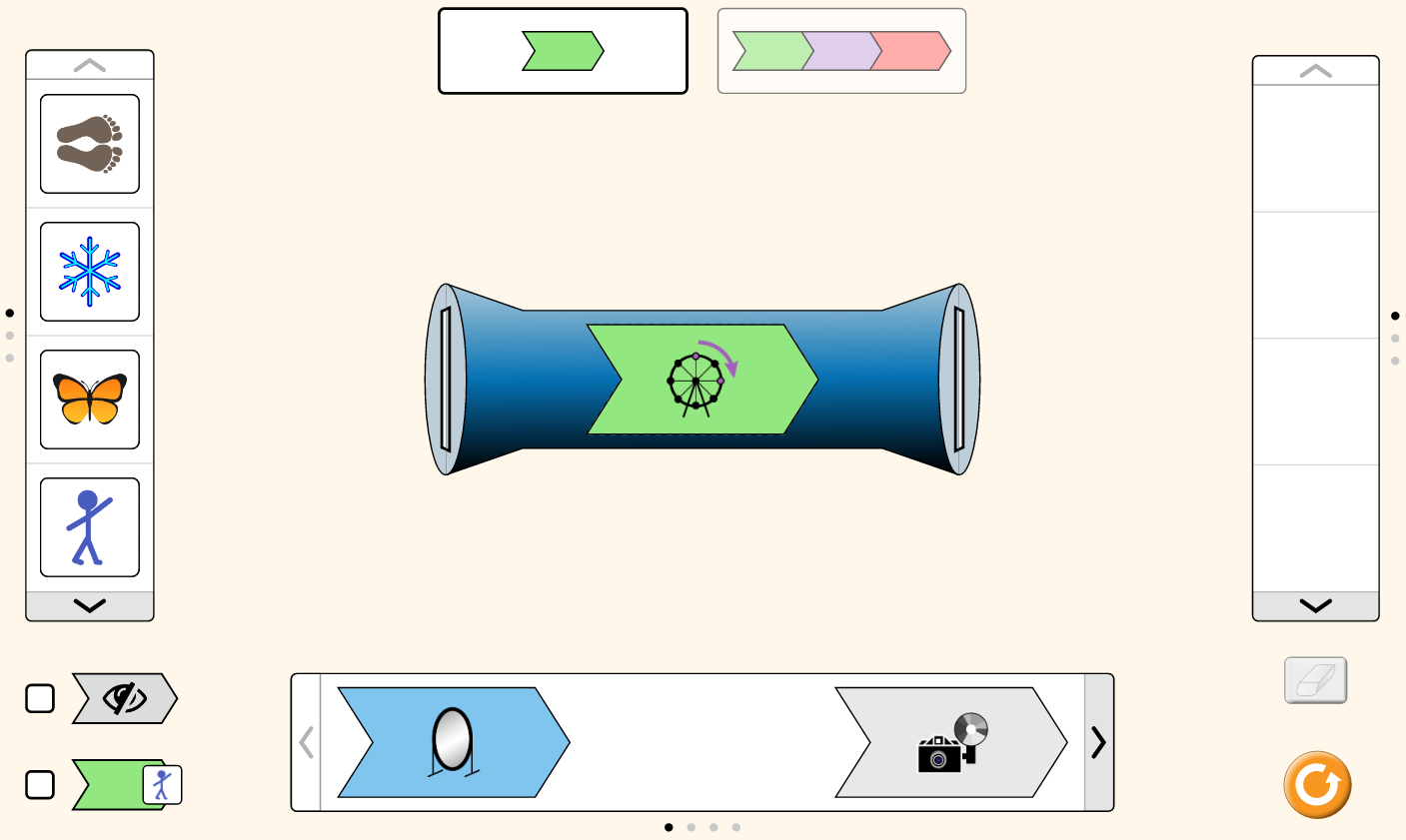
[](https://phet.colorado.edu/sims/html/function-builder/latest/function-builder_en.html)

**Exploration Phase:**

1. Briefly explore what will happen to the **four** pictures on the left, when the “mirror” image is placed in the “builder”. 



1. Briefly explore what will happen to the **four** pictures on the left, when the “rotating wheel” image is placed in the “builder”. 



**Questions**

1. What happens to the images on the left when it is put through the “builder”?
2. Based on your exploration, match the parts of the stimulation to the word bank:

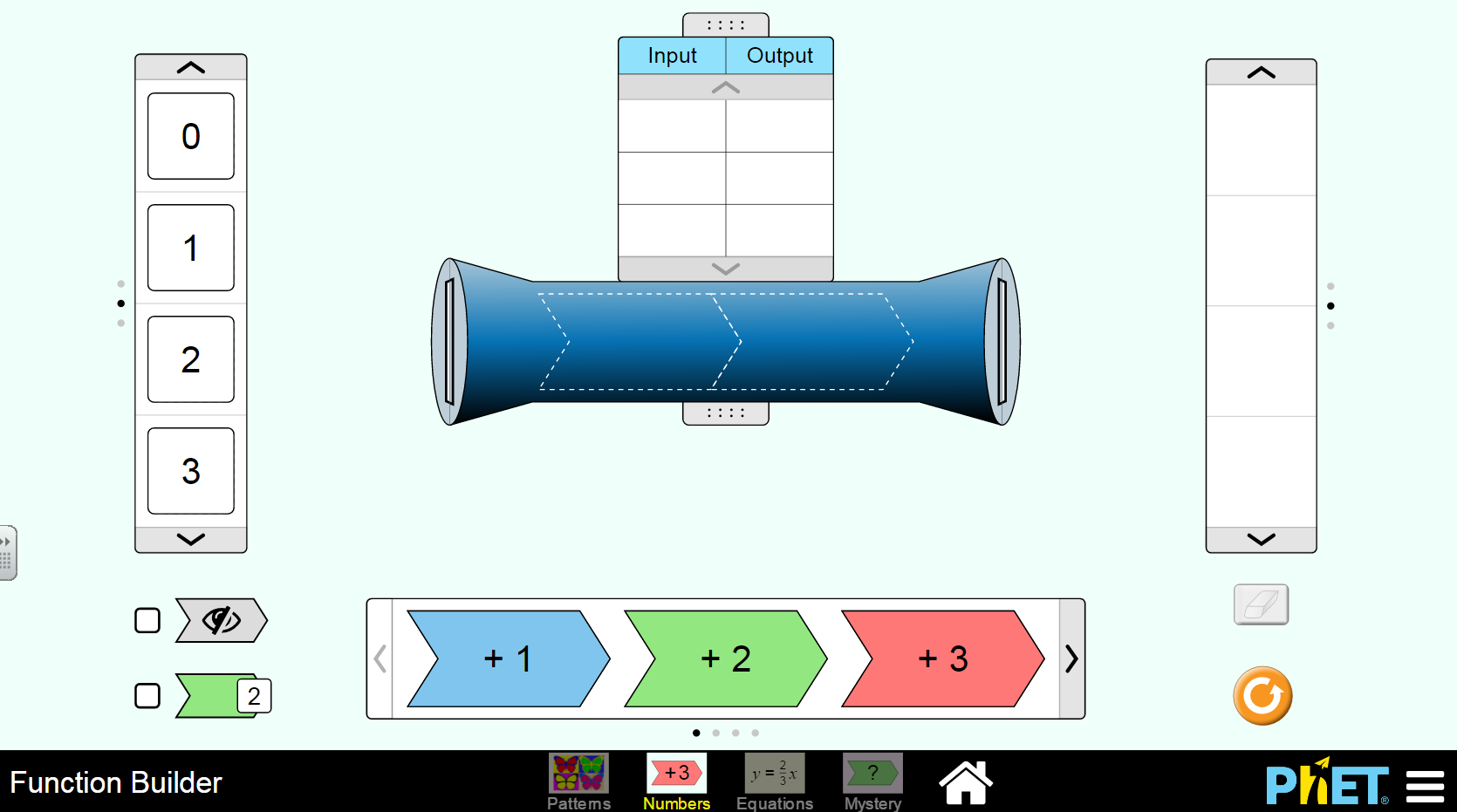
|  |  |
| --- | --- |
|  | Word Bank |
| 1. Left images \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2. Right images\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3. Builder\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | * Function * Output * Input |

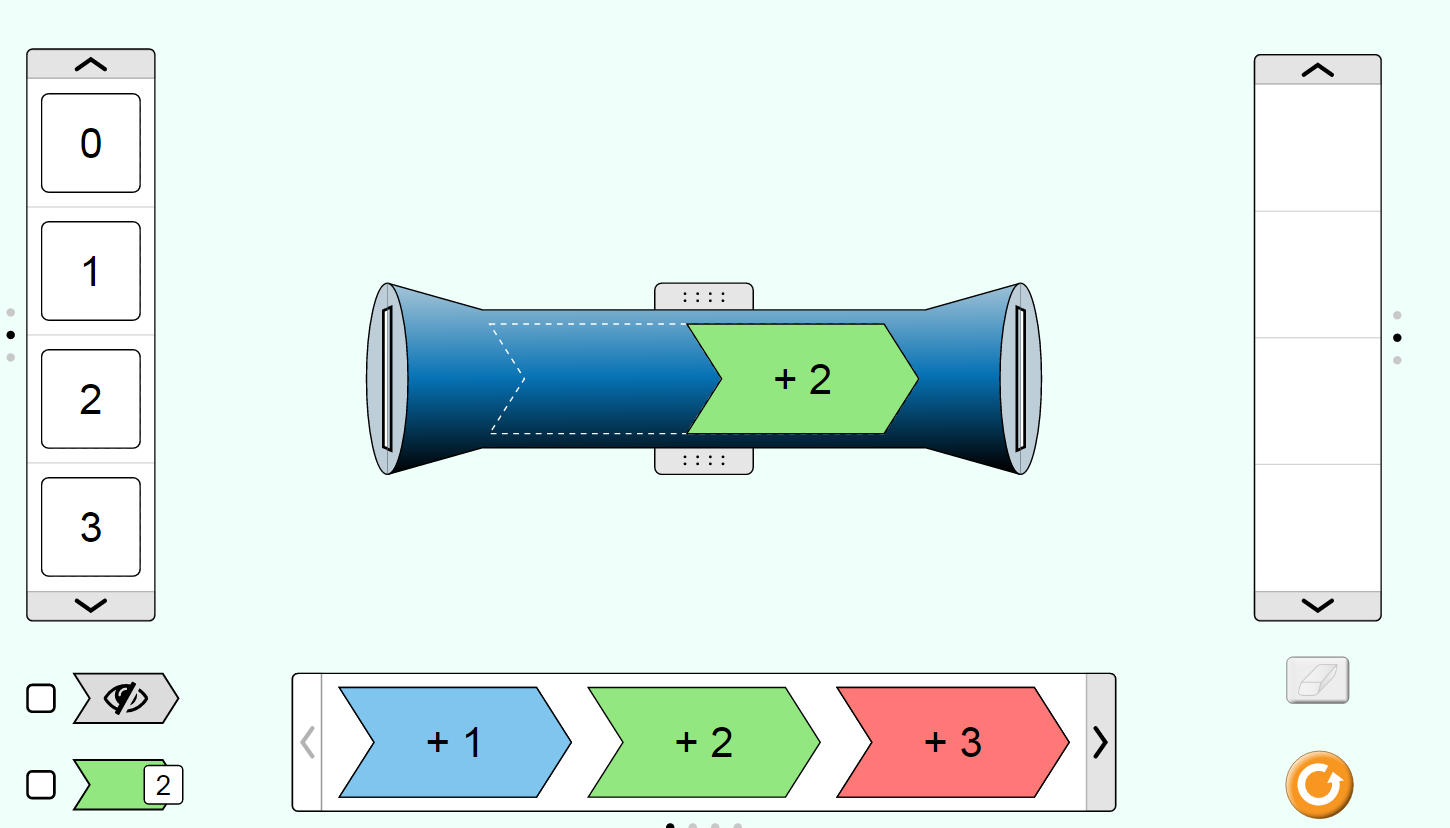
1. Why are the images on the left different from the images on the right?

**Explanation Phase:**

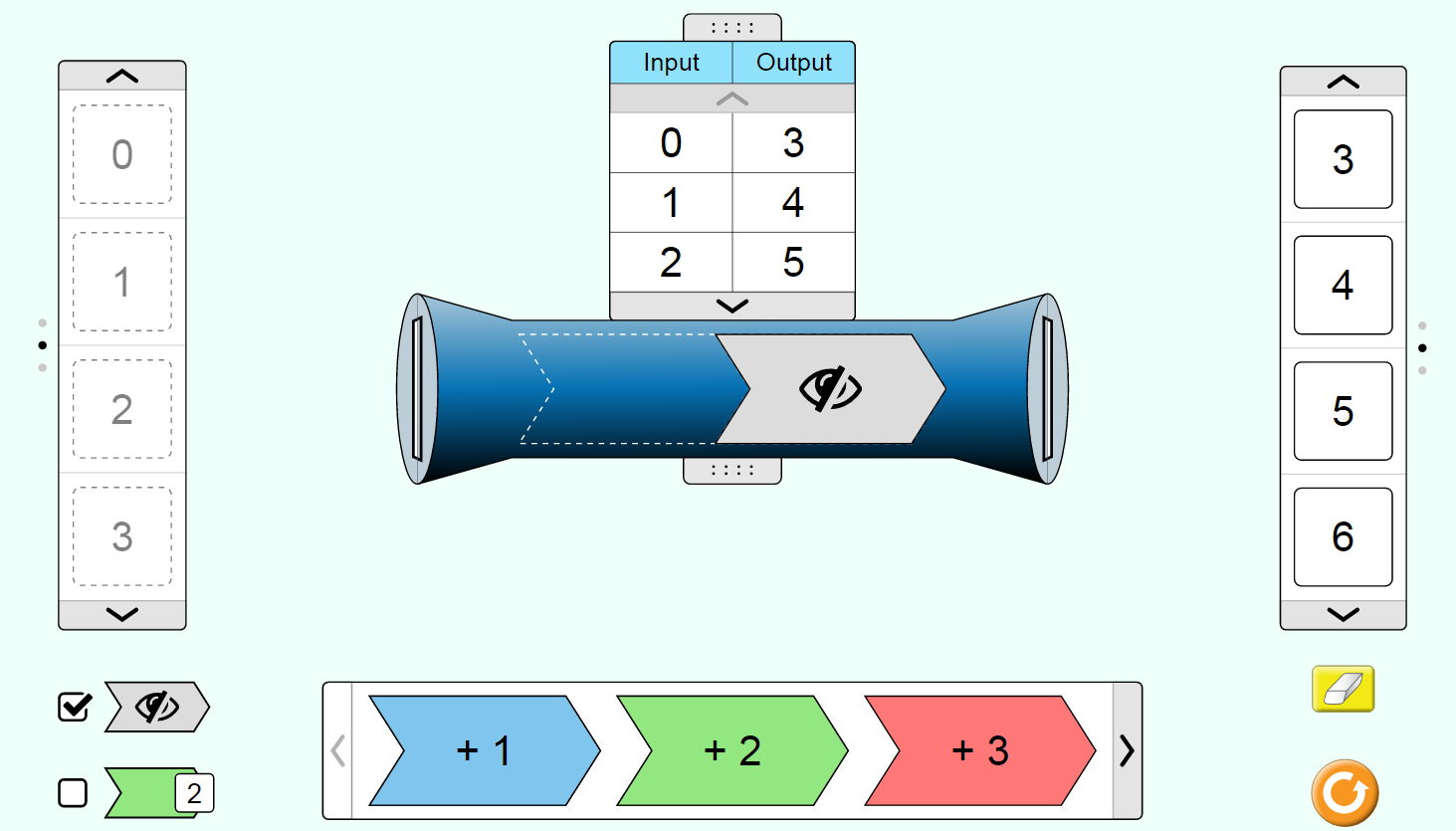
This Phase has an investigative goal.

1. Click on the “Numbers” tab. This screen appears:

2. Determine the values of the “right” side (output) based on the “left” side (input) and “builder” (function).



1. Determine what the function is based on the input and out values.

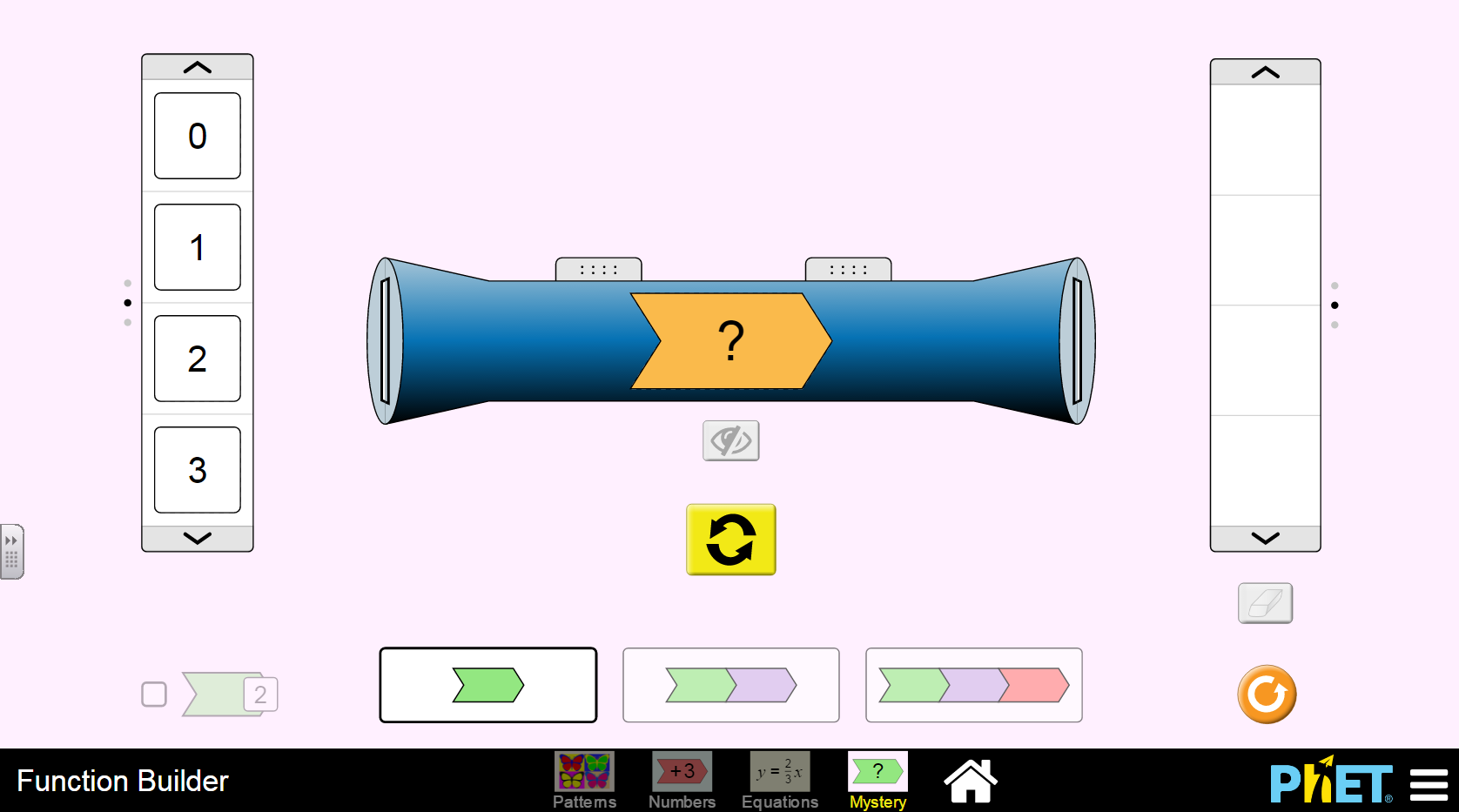


HELP: Use this tab!

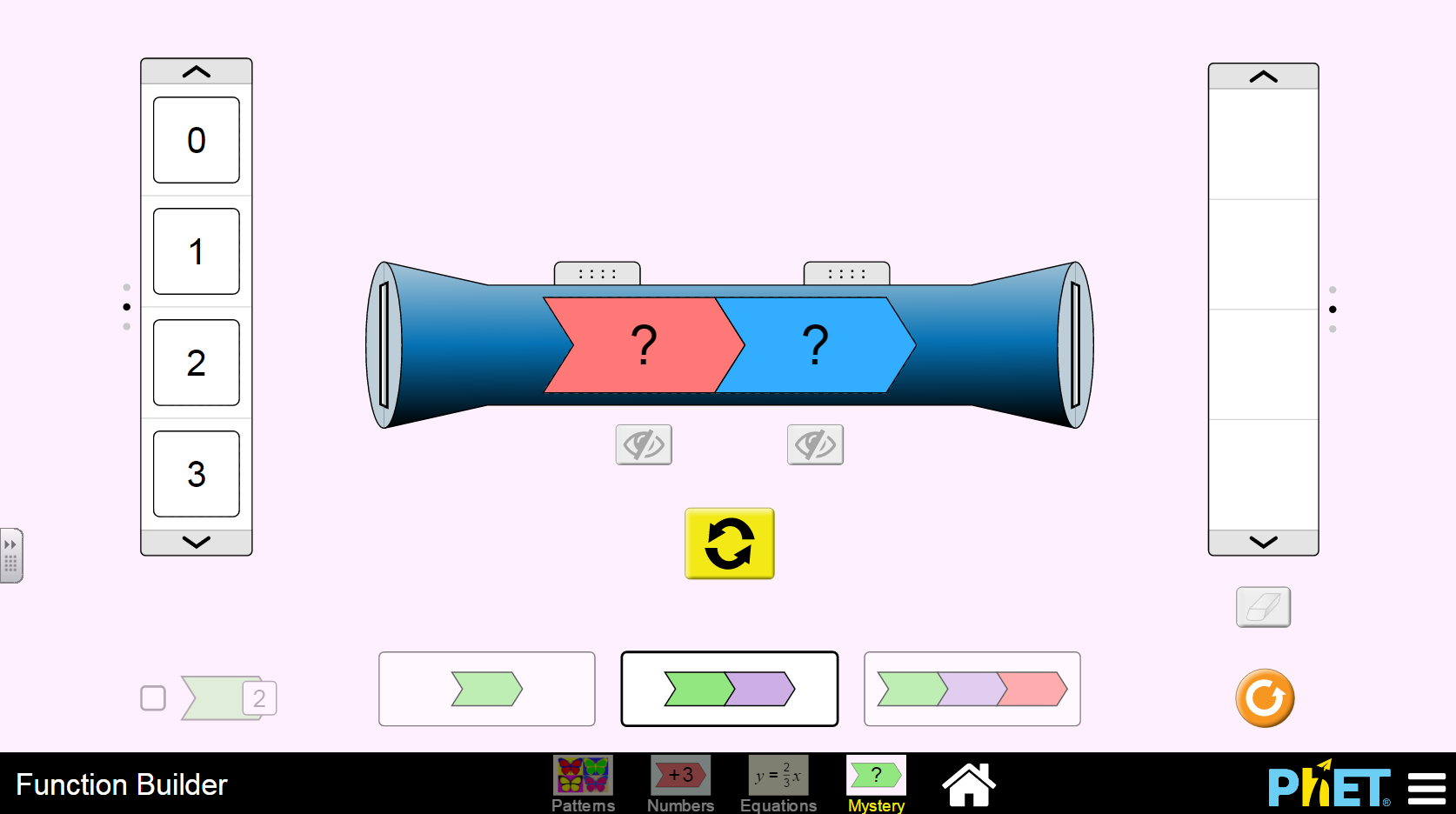
 Function =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Application Phase**

1. Click the “Mystery” tab.The screen below appears.



1. Put the input values into the function to find the output values with one mystery function. Determine what the function is based on the input and output values.
2. Put the input values into the function to find the output values with two mystery functions. Determine what the function is based on the input and output values.



HELP: Use this tab!

Questions:

1. What is the pattern between the inputs and outputs when given a function?
2. How would you determine what the input is, if you were only given the output and function?

Congratulations: You’re finished!