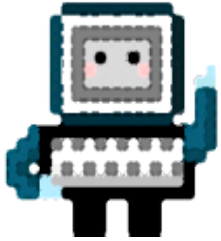


# 2.2. Programming Number Operations w/ Python

**Note:** The numbers in the Card match the Tasks numbers in the Jupyter Notebook.

1. Let's use Algebra and Mathematics to program the Guessing Game with Python.



In the Guessing Game, we don't know the number the person is thinking. All we know is the operations we ask them to do. Next, focus on how the operations relate to the number to be guessed.

2. In **CELL 2A** in **Jupyter**, run the code multiple times & discuss what happens. Then make & predict changes.

```
# CELL 2A: Run this cell and enter a number.  
# How does your number change? Why?  
# Can you explain what the lines below do?  
# After playing a couple of times, take turns making changes  
# and predict what will happen.  
x = int(input("Enter a number:          x          = "))  
print("Multiplying x by 2 gives:      2*x      =", 2*x)  
print("Adding 3 to the result gives 2*x+3 =", 2*x+3)
```

```
Enter a number:          x          = 3  
Multiplying x by 2 gives:      2*x      = 6  
Adding 3 to the result gives 2*x+3 = 9
```

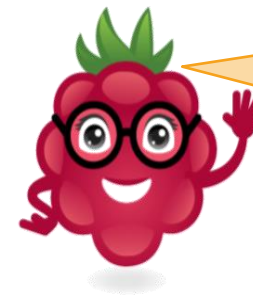
The number entered for 'x' is 3. How are the 6 and 9 related to 3?

enter other numbers, explore how they relate.

3. In **CELL 2B** in **Jupyter**, there are variables (x, y and z). *What is a variable?* Run this Cell multiple times and change the numbers, operations and re-name the variables.

How do you think we can use variables and operations to guess a number we don't know?

4. In **CELL 2C**, create your own game by modifying the operations and replacing the '?' with numbers. Re-name variables, if wanted.

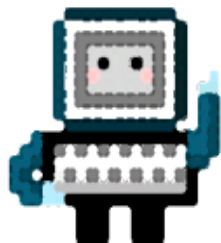


**Talk:** How do you think Python helps us do math? How are programming and thinking alike?

# 2.2. Programación de Operaciones Numéricas con Python

Nota: The numbers in Card match the Tasks numbers in Jupyter Notebook.

1. Vamos a usar álgebra y matemáticas para programar el *Guessing Game* con Python.



En el *Guessing Game*, no sabemos el número que la persona está pensando. Todo lo que sabemos son las operaciones que les pedimos que hagan. Ahora, veamos cómo las operaciones se relacionan al número que se adivinará.

2. En la **CELL 2A** en **Jupyter**, corre el código varias veces y discute qué pasa.

```
x = int(input("Enter a number:          x          = "))
print("Multiplying x by 2 gives:      2*x      =", 2*x)
print("Adding 3 to the result gives 2*x+3 =", 2*x+3)
print(" ")
print("What happened?")
```

El número que se pone en 'x' es 3. ¿Cómo se relacionan el 6 y el 9 al 3?

Enter a number: x = 3  
Multiplying x by 2 gives: 2\*x = 6  
Adding 3 to the result gives 2\*x+3 = 9

Usa otros números y explora cómo se relacionan.

3. En la **CELL 2B** en **Jupyter**, hay variables (x, y, & z) ¿Qué es una variable? Corre la Cell varias veces para cambia los números y las operaciones, y renombra las variables.

¿Cómo crees que podemos usar las variables y las operaciones para adivinar un número que no sabemos?

4. En la **CELL 2C**, crea tu propio juego cambiando las operaciones y poniendo números en lugar de '?'. Si lo deseas, re-nombra las variables.



¿Cómo crees que Python nos ayuda a hacer matemáticas?  
¿En qué se parecen pensar y programar?