

Intro to Python

Grade 8

By Alise Braick

Previous Knowledge

7th grade: CSD/code.org: Block -based programming

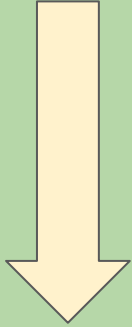
CS Concepts:

- Variables
- Drawing shapes
- Built-in Functions
- Loops
- Conditionals
- Sequences

Understanding by Design_ Backward Design

Receipt Calculator

Backward Design



```
name = input("What's your name? ")
print ("Welcome , " +name + ", to your receipt calculator")
items = int(input("How many items did you buy? "))
total = 0
for i in range (items):
    total = total + int(input("What is the cost for your item #" +
str(i+1) +"? $"))
print(name +" your total is: $" +str(total))
# or alternative way to print
print (name, "Your total is: $",total)
```

SKILLS ANDS CONCEPTS ASSESSED

- Variables
- Getting and displaying Information
- Concatenation
- Data Types / Math Operations
- For Loops

Lesson	Big Ideas	Example
Variables	Variables are used to store a piece of information We can reassign variable values →the output will be the value of the most recent assignment.	<pre>x = 76 x = "Sammy" print(x)</pre>
Displaying Information (print)	a string has to be wrapped inside a single or double quote concatenation: joining strings together to create a new string can be done using the + operator	<pre>print("hello " + name)</pre> (+) String concatenation
Getting Information	Use the input() function to get information from the user.	<pre>color = input("What is your favorite color? ") print("your favorite color is " + color)</pre>

Lesson

Big Ideas

Example

Data Types

We need to convert the int to a string when concatenating a string and an integer

If you WANT this data type ↓		Use this function! ↓	Examples
string		str()	str(5) ⇒ "5" str("hey") ⇒ "hey"
integer		int()	int("4") ⇒ 4 int("hey") ⇒ ERROR

Math Operations

We can Perform basic arithmetic operations in Python (addition, multiplication, and division)
The default output of the user input is a string.
That's why we need to wrap an int around the user input statement

```
length =int(input("What is the length of the rectangle?"))  
# Why does the code in line 5 have int before the input()? int(input()  
  
width = int(input("What is the width of the rectangle?"))  
# Why does the code in line 8 have int before the input()? int(input()  
  
perimeter = 2 * (length + width)  
# what is the value of the perimeter?  
  
print("The perimeter is " + perimeter)
```

Practice Math Operations-Average Calculator

```
name = input("What is your name? ")  
score1 = float(input("What is the first test score?"))#user input  
score2 = float(input("What is the second test score?"))  
score3 = float(input("What is the third test score?"))  
avg = (score1 + score2 + score3) / 3 # Calculate Average  
print("Hi " + name + "! Your average is " +str(avg)) #concatenate
```

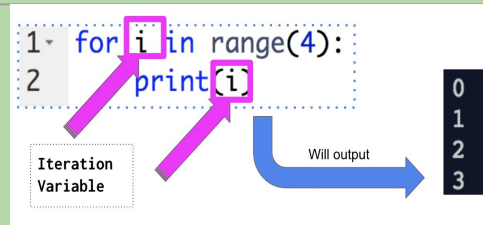
Lesson

Big Ideas

Example

For Loops

The range() function executes a group of statements for a specified number of times (starts from 0)



For Loops + user Input

Syntax + For loops with user input

FIND the 6 ERRORS

```
for i in range 5:  
    add = input("Give me a whole number")  
total + add  
print("Your total for all five numbers is:" + total)
```

While Loops

while condition is true:

repeat this code In other words, it will repeat the indented code as long as the condition or boolean is true (it checks at the beginning of each loop)

- Practice reading and analyzing while loops of various conditions

```
1 count = 6  
2 while count > 5:  
3     print("hi!")  
4     count = count + 1  
5     print("Good bye!")
```

CRASHED!!!

Lesson	Big Ideas	Example
While Loops and Conditions	<ul style="list-style-type: none">● We can use While Loops with one or more conditions● Visualize Execution (frame by frame)	<pre>answer = 7 guess = int(input("What's the magic number?")) while guess != answer: guess = int(input("Try again! What's the magic number? ")) print("Good guess!")</pre>
Future Lessons Conditionals		<u>Guessing Dice Game</u>

Formative Assessments	Summative Assessments
Check-In	<ol style="list-style-type: none"> 1. Displaying/getting informations 2. Data Types/Math Operations 3. For Loops 4. While Loops
Error Analysis, Code Prediction, Debug	
Trace Table	
Assessing and Advancing Questions	
Scaffolded questions/Big reveal	
Visualize Code (frame by frame)	
Mini Projects/Homework	<ul style="list-style-type: none"> • Code Academy • Code HS • thinkcs.py • Python Tutorial W3Schools • Visualize Python • Math for America Workshops
Resources	