Introduction To Python
Lesson Plan: Class 07 / PRG / 01

Overall goal of the lesson	**Children will get introduced to the Python programming language and understand the concept of variable and assignment.**
Prior knowledge required	Concepts of instructions and programming.

MODULE 1: **Module time:** 35 minutes

Goal:	Students will be able to value the importance of text based language
Description:	To get the children to get started with the Python Language by learning basic input and output. Also, to get them understand the concept of variables and various arithmetic operators.
Material Required:	**Physical:** Writing material for students to note down the instructions written on blackboard **Electronic:** A computer with a Python compiler (version 3.x) for each student and the teacher (with a projector). If there is an internet connection,https://www.codechef.com/ide can be used. A projector with the computer screen of the teacher projected for the students to see.
Download and Install Python:	Python 3.4 - https://www.python.org/downloads/release/python-344/ Python 3.6 - https://www.python.org/downloads/release/python-362/
Procedure Summary:	Follow the lesson plan and ask the students to type in the commands on their computer when required. You can also type the programs on a computer projecting it to the students on a screen so that they can see the output.
Procedure Details:	Follow the slides 1. Slide 2: Discussing a real world problem using Scratch 2. Slides 2-5: Discussing observations on how they tried to solve the given problem using Scratch 3. Slide 6: Discussing the limitations of Scratch 4. Slide 7-10: Telling them about the real world applications of text based language 5. Slide 10: Tell the students that they are going to learn a text based programming language, which is Python. There are two different widely used versions of the language (2.x and 3.x). We are going to use 3.x (Just for information sake).
Assessment:	
Information Broadcast:	

MODULE 2: **Module time:** 35 minutes

Goal:	Students will be able to understand how to input/output, use variables in Python
Description:	To get the children to get started with the Python Language by learning basic input and output. Also, to get them understand the concept of variables and various arithmetic operators.
Material Required:	**Physical:** Writing material for students to note down the instructions written on blackboard **Electronic:** A computer with a Python compiler (version 3.x) for each student and the teacher (with a projector). If there is an internet connection,https://www.codechef.com/ide can be used. A projector with the computer screen of the teacher projected for the students to see.
Download and	Python 3.4 - https://www.python.org/downloads/release/python-344/

Install Python:	Python 3.6 - https://www.python.org/downloads/release/python-362/
Procedure Summary:	Follow the lesson plan and ask the students to type in the commands on their computer when required. You can also type the programs on a computer projecting it to the students on a screen so that they can see the output.
Procedure Details:	Follow the slides 1. Slide 12: a. Introduce them the “Hello world” program b. **Note:** Here we introduce print() function without stressing on it much. 2. Slide 13-17: a. Extend the program to greet the user. b. As we proceed, raising the need of a variable and introducing it as a container c. Introducing the input() function to take the name of the user d. They learn the string concatenation operator (‘+’) as a side effect. 3. Slide 18: Highlighting the concept of assignment operator 4. Slide 19: a. Using multiple variables with example b. Stress on the fact that variables can be reused c. Highlighting that the name of a variable is case sensitive 5. Slide 20: a. Changing the value of a variable. Show them that values inside a variable can be changed. 6. Slide 21-25: a. Making them understand the flow of a program by line-wise executing the code 7. Slide 26: a. Give them a question to swap values in 2 variables to try on their own. Tell them we will discuss in the next class
Assessment:	1. Using the code below, you must re-write it without the syntax errors. There should be about 7 errors in total. Can you spot them all? Print(hello) Print(This is the start of the lesson”) Print(“You need to remember what we did last week”) print(“For Example”) print(“This is how you use a variable in a sentence”) Number1 = 15 print(“Your age is” Number1) Rewrite the code below with the correct syntax 2. What will be the output of the below code? message1 = “Good” message2 = “morning” print(message1 + message2) message2 = “evening” print(message1 + message2 + “people”) message3 = message1 + “day” print(message3)
Information Broadcast:	Activities: 1. What’s the score? - https://www.stem.org.uk/system/files/elibrary-resources/legacy_files_migrated/37680-KS2-Variables-Unplugged-Activity-Barefoot-Computing-Project.pdf 2. Envelope Variables - https://studio.code.org/s/course4/stage/4/puzzle/1 3. The Box variable activity -

	https://teachinglondoncomputing.org/resources/inspiring-unplugged-classroom-activities/the-box-variable-activity/

MODULE 3: **Module time:** 35 minutes

Goal:	Students will be able to understand how to evaluate variables and expressions in Python.
Description:	To get the children to get started with the Python Language by learning various arithmetic operators.
Material Required:	**Physical:** Writing material for students to note down the instructions written on blackboard **Electronic:** A computer with a Python compiler (version 3.x) for each student and the teacher (with a projector). If there is an internet connection,https://www.codechef.com/ide can be used. A projector with the computer screen of the teacher projected for the students to see.
Download and Install Python:	Python 3.4 - https://www.python.org/downloads/release/python-344/ Python 3.6 - https://www.python.org/downloads/release/python-362/
Procedure Summary:	Follow the lesson plan and ask the students to type in the commands on their computer when required. You can also type the programs on a computer projecting it to the students on a screen so that they can see the output.
Procedure Details:	Follow the slides 1. Slide 30-32: Discussing the solution of the program to swap 2 variables 2. Slide 33: Doing math with variables - Writing a variable to add 2 numbers a. Kindly note, this example is taken to highlight the difference between integers and strings only because the input() function returns a string and to do math we need to convert it into an integer as we see in the next slide. 3. Slide 34: Explaining the conversion from String to Integer a. Now ask them to run the program using the int() function and observe the result b. The students may ask about the "+" operator being overloaded, i.e, behaving differently when two strings are added than when two integers are added. If they ask, explain them that with strings, the two strings are concatenated while with integers, they are mathematically added. 4. Slide 35: Arithmetic Operators - Introduction a. Introduce arithmetic operators (+,-,*,/,//, **) through evaluating expressions in variables. b. Overview of arithmetic operators

Operator	Symbol	Operation	Example
Addition	+	Adds the given numbers	3+4 (=7)
Subtraction	-	Subtracts the second number from the first one	7-5 (=2)
Multiplication	*	Multiplies the given two operands	4*3 (=12)
Division	/	Divides first number by second number	5/3 (=1.66666
Integer Division	//	Divides first number by second number and gives only the integer value. ie. it leaves the decimal part	5//3 (=1)
Modulus	%	Gives remainder when first number is divided by the second number	7%4 (=3)
Exponent	**	First number's power raised to the second number	a**4 = a4

	c. Make the students do the above examples on their computer. Encourage them to play around with examples that they can think of. Make them to write a program that accepts two numbers from a user and does all of the above operations and gives output in this way: Ex: inputs are 12 and 5 Output: sum → 17 difference → 7 product → 60 quotient → 2 remainder → 2 power → 248832 5. <u>Slide 36:</u> a. Ask them to write a program that will take a temperature value in Fahrenheit and print it in Celsius. b. [Formula: T(°C) = (T(°F) - 32) × 5/9] 6. Give them more such problems to solve that need conversions of different formulae from Physics/Math classes. You can give from the worksheet also.
Assessment:	In the worksheet - https://docs.google.com/document/d/1E7Xn1exCKjTjnximbhNwh_CVYLeSUNMFod_cLAlsGfU/edit?pli=1#
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