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| **3b Python Programming** |

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| **Keywords** | **Printing** | **Inputs** |
| **Algorithm:** A set of instructions or code used to solve a problem.  **Syntax:** The rules of the programming language that need to be followed in order for it to work.  **Variables:** Data that is stored in memory that is likely to change.  **Program:** Code compiled together to perform a specific function. | To print out a statement or a variable we use the code below:  **Printing a new message**: print(“Hello World”);  **Printing the value of a variable**: print(x);  **Printing a message with variables included:** print(“Hello”, name, ”your are”, age, ”years old today”); | To allow your Python program to get information from the user you will need to use the input command.  Make sure you use the correct command for what you are asking for.  **String inputs (such as a name)**:  input(“Enter your name”);  **Integer Inputs (for whole number responses):** int(input(“What is your age?”));  **Float Inputs (for decimal number responses):** float(input(“What is your shoe size?”)); |
| **Data Types** | **Selection** | **Iteration** |
| **String:** Letters, characters and numbers.  **Integer:** A Variable data type that can store whole numbers.  **Float:** A Variable data type that can store decimal numbers.  **Boolean**: A Variable data type that stores either TRUE or FALSE. | Selection is used to allow the program to make a choice and take a different path.  The keywords used in Python are:  if - checks if the condition is true, if so the program runs the indented code below it.  elif - if the first if fails then this elif condition is checked, there can be multiple of these.  else - if all if and elif statements are not true the the code indented below else will run.  Example:  colour - input(“Enter your favourite colour”);  if colour == “Red”:  print(“Reminds me of tomatoes”);  elif colour == “Blue”:  print(“Reminds me of the sea!”);  else:  print(“If it ain’t Red or Blue then I ain’t interested”); | Iteration is used to repeat a set of instructions or commands in a program.  There are two loops in Python programming:  **While** - Checks if a condition is true and while it is true will keep repeating it.  **For -** Runs for a specific amount of times and stops when it reaches the desired number.  **Examples:**  while answer != “London”:  answer = input(“What is the capital of London?”);  Or  for i in range(5):  movie = input(“What is one of your top 5 favourite movies?”) |
| **Variables** | **Common errors** | **Extra challenge:** |
| Variables are simply a place on the computer's memory that is given a name in order for it to remember it. In Python you create a variable by writing the name of the variable followed by an =.  **Examples:**  name = “Spongebob” | **Name errors**: when a function or variable has been spelt incorrectly.  **Syntax errors:** errors with the structure of code. For example, brackets, colons, equals signs, speech marks, indentation.  **Grammatical errors**: human errors. Python doesn’t detect these. | Jennifer wants to carpet her new room. Create a program that will work out the area of any sized room in metres2..  (area = length x width)  What will our variables be called?  What data type do we need?  What formula do we need to calculate the area? |