**Algorithms Task sheet to illustrate difference between informal instructions, algorithms and computer program**

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| ***Informal instructions*** | ***Algorithm*** | ***Computer Program*** |
| 1. Do some baking to produce chocolate cupcakes | 1. Obtain the recipe 2. Collect the necessary ingredients    1. …sugar    2. …flour    3. …butter    4. …eggs    5. … milk    6. …chocolate chips 3. Mix them according to instructions    1. Cream the butter and sugar    2. Add the egg and milk    3. Add the flour and baking powder    4. Add the chocolate chips 4. Place in empty cupcake holders 5. Place on baking sheet 6. Bake in oven for stipulated time | To program a robot to follow the algorithm will require very specific programming language commands |

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| ***Informal instructions*** | ***Algorithm*** | ***Computer Program*** |
| 2. Play a game of TIC TAC TOE | 1. Two players are required  2. Draw a 3 by 3 grid of squares  3. Player A draws a X in one square  4. Player B draws a circle in an empty square  5. Repeat steps 3 and 4 until either :  a row or a column or a diagonal is  completed with either a X or a circle  or  all the squares have been completed  6. If there is a row or column or diagonal with all X then player A is the winner  7. If there is a row or column or diagonal with all O then player B is the winner  8. If Not (6 or 7) then no-one is the winner  *Check if this algorithm satisfies the 5 criteria for a good algorithm* | Program: Version 1 - many more functions to add… draw the board, display the board as each player selects a square… determine if winning criteria satisfied….  # Tic-tac-Toe  #Plays the game of tic-tac-toe against a human opponent  # written from notes in michael dawson book - Python programming - ch 6  # April 2008  #display game instructions - page 162 and 181  def display\_instruct():  """Display game instructions"""  print ( \  """  Welcome to the greatest intellectual challenge of all time: TicTacToe  This will be a showdown between your human brain and my silicon processor  You will make your move known by entering a number 0 -8  The number will correspond to the board position as illustrated:  0 | 1 | 2  ----------  3 | 4 | 5  ----------  6 | 7 | 8    Prepare yourself human. Thed ultimate battle is about to begin. \n  """)  # end display instruction function  #main  print ("Here are the instructions to the Tic-Tac-Toe game")  display\_instruct()  print ("Here they are again")  display\_instruct ()  print ("You probably understand the game by now ")  input("Press the enter key to exit") |

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| ***Informal instructions*** | ***Algorithm*** | ***Computer Program*** |
| 1. Play a game of snakes and ladders |  |  |

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| ***Informal instructions*** | ***Algorithm*** | ***Computer Program*** |
| 1. \*Encrypt your name using a Caesar cipher |  | *Write the program in Scratch* |

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| ***Informal instructions*** | ***Algorithm*** | ***Computer Program*** |
| 1. \*Determine the average height of the students in your class |  | *Write the program in Scratch* |