Lesson 09\_Logic Gates   
   
Unit: Computer Architecture   
   
Lesson Title: Logic Gates truth tables and Diagrams  
   
IB Syllabus Alignment: 2.1.13 Construct a logic diagram using AND,

OR, NOT, NAND, NOR and XOR gates.  
   
SWBAT/IB Teaching Standard for Assessment.   
Do Now / Coding Component (2 minutes Turn-and-Talk) :

Play parts of video from: [(1) Logic Gates and Truth Tables - YouTube](https://www.youtube.com/watch?v=AXtJLgzW3sQ)

That summarizes NOT, OR & AND Gates.

Students must produce a real life example that relates to the 3 gates.

Example given in video: a front doorbell pressed and back door bell pressed similar to OR Gate.

Teaching notes: Reemphasize the input-computing-output components of the task.   
   
Part A. Introducing the Lesson (5 minutes)

Show how the following website works and will help in learning this topic:

[Wolfram|Alpha Widget: Boolean Algebra Calculator (wolframalpha.com)](https://www.wolframalpha.com/widget/widgetPopup.jsp?p=v&id=4c86f3bbcab249f879058d1825887571&title=Boolean%20Algebra%20Calculator&theme=green)

Part B. Student Centered Activity. (20 minutes)

- Students will work in pairs to complete the worksheet to show full understanding of the combination of logic gates with its truth tables.

Part C. Whole Group Lesson Component /Harkness Protocol (15 minutes)   
   
Each of the groups will present their work in 2-3 minute presentation blocks.

Part D: Homework assignment:

Observe the following python code and create a similar code that will represent the OR and XOR gate:

**def** AND (a, b):

**if** a **==** 1 **and** b **==** 1:

**return** True

**else**:

**return** False

# Driver code

**if** \_\_name\_\_**==**'\_\_main\_\_':

**print**(AND(1, 1))

**print**("+---------------+----------------+")

**print**(" | AND Truth Table | Result |")

    print(" A = False, B = False | A AND B =",AND(False,False)," | ")

    print(" A = False, B = True | A AND B =",AND(False,True)," | ")

**print**(" A = True, B = False | A AND B =",AND(True,False)," | ")

    print(" A = True, B = True | A AND B =",AND(True,True)," | ")