*Name :*_____

Target grade: _____

Design & Technology Department

GCSE Electronic Products

Revision Exercises

Part 2

Topics:

Logic Gates
4026 7-Segment Counter
4017 Decade Counter

Mr.Clarvis

Feedback sheet

Name:_____	Group:_____

Date:	Target:	*Grade:*	Effort:

Strengths:

Areas for development:

General comments:

EJC230511

Learning Objectives

- Understand that logic is used when circuits require more than one input;
- Use the following logic gates and construct their truth tables: AND, OR and NOT;
- Understand that logic gates respond to, and output, digital signals and distinguish these from analogue signals.

Task 1: Draw the symbols for the logic gates below, and draw their truth-tables, label the inputs and outputs.

AND GATE

Input A	Input B	Output (Q)

OR GATE

Input A	Input B	Output (Q)

NOT GATE

Input A	Input B	Output (Q)

Task 2: Describe the differences between analogue and digital signals.

_____

_____

_____

_____

_____

http://www.clarvis.co.uk/version2/logic%20gates.html

Task 3: Complete the graphs showing a digital and an analogue signal.

Analogue Signal

Digital Signal

Task 4: Which other words can be used to describe the terms LOGIC 1 and LOGIC 0 when in relation to digital circuits?

_____

_____

_____

Task 5: Describe what is meant by: PULL UP resistors and PULL DOWN resistors in relation to digital circuits and switches.

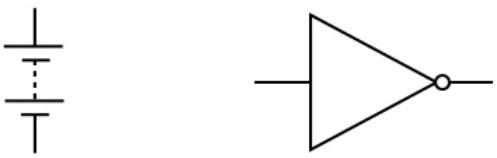
PULL UP:_____

_____

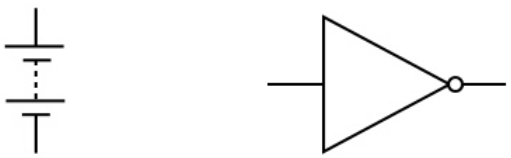
PULL DOWN:_____

_____

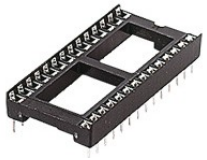
Task 6: In the space below show how a PTM switch can be used with a PULL UP resistor to put a logic 0 on the input of a NOT gate when the switch is pressed.



Task 7: In the space below show how a PTM switch can be used with a PULL DOWN resistor to put a logic 1 on the input of a NOT gate when the switch is pressed.



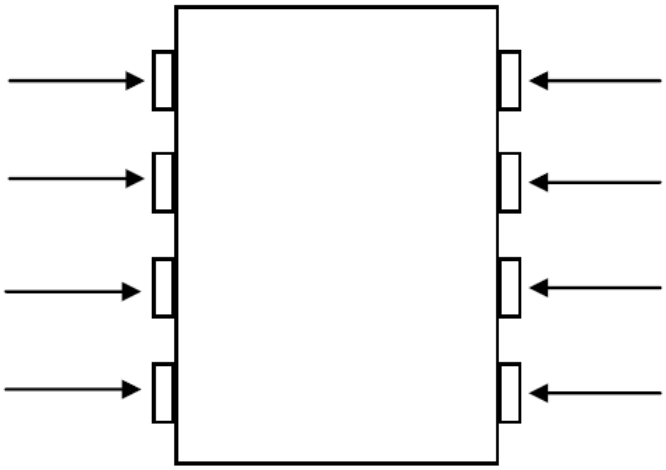
Learning Objectives



- Describe what is meant by a Dual In Line (DIL) IC package;
- Identify the pin numbers on a dual in line IC;
- Describe the use of an IC socket;
- Show awareness of dedicated ICs found in toys

Task 8: What does DIL stand for? _____

Task 9: label pins on the chip shown below. Show the **two** methods used to help you identify pin number 1.



Task 10: Explain two reasons why we use a DIL socket rather than just soldering an IC straight onto a PCB (circuit board):

_____

_____

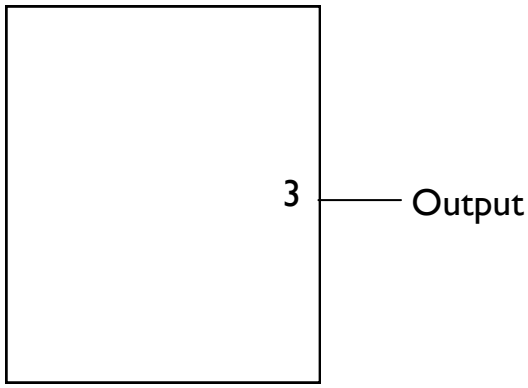
_____

_____

_____

_____

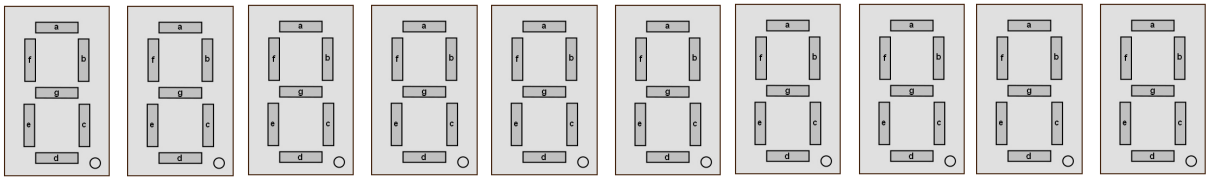
Task 11: Complete the circuit symbol of a 555 timer IC.



Learning Objectives

- Be able to use 4017 decade counter
- Be able to use 4026 7-segment counter

Task 12: Shade the images below to show how the digits 0 to 9 are displayed on an LED display.



Task 13: Draw the circuit diagram of a 4026 7-segment counter including two switches—one to increase the count value and one to reset the counter.

Task 14: Explain the function of the following input and output pins on a 4026 counter.

CE: _____

_____

_____

EO: _____

_____

_____

R: _____

_____

_____

"<" symbol: _____

_____

_____

Learning Objectives

- Be able to use 4017 decade counter
- Be able to use 4026 7-segment counter

Task 15: Draw the circuit diagram of a 4017 decade counter including two switches—one to increase the count value and one to reset the counter.

Task 16: Explain how the circuit above works.