



The Thomas Hardy School

Summer Preparation Task

Electronics A Level
WJEC

Purpose of task:

The work will be collected for assessment and feedback at the beginning of the course and will serve to assess levels of motivation and commitment as well as independent study skills.

You should expect to spend between 3-4 hours on the activities. Activity 2 is particularly relevant if you did not study Systems & Control at GCSE.

Task:

1. Create an **electronics glossary** with definitions for each of these words: Analogue, Digital, Binary, Transducer, Micro-controller, Microprocessor, Voltage, Current, Resistance, Resistor, PCB, Assembly Language, Assembler, Compiler, LED, LDR, Thermistor, Thyristor, Moore's Law, Transistor, Capacitor, Multi-meter, Earth connection, Battery, A.C., Attenuation, and Amplifier
2. Download and install **Circuit Wizard 3 Student Edition***
 - a. Design a transistor-based dark detecting circuit with an adjustable threshold value
 - b. Design an op-amp comparator circuit that gives a blue output when cold and a red output when warm (hint: you will need to sink/source current)
 - c. Design a 555 astable circuit that flashes an LED on/off at approximately 1 Hz
 - d. Modify the astable circuit to use a thyristor latch and two push-to-make switches. One switch should start the flashing cycle, the other should reset the latch.

*If you do not have a home computer then you can draw the circuits on paper by hand and then transfer the designs to Circuit Wizard at the start of term. Learning how to use Circuit Wizard is an *essential* skill to complete this course successfully.

Recommended resources:

You can take a copy of Circuit Wizard 3 Student Edition from the shared network drive:

- T:\Art & Design\DesignTech\Electronics\Circuit Wizard\Circuit Wizard 3 (Student Edition)

Alternatively, you can download via the school website:

- <https://files.thomas-hardye.net/s/ra8ZFDrQBnKC46R>

You may be prompted for a password. If so, please request the password by email from Mr Pizzey (bpizzey@thomas-hardye.net) using your school email address. No personal email addresses, please.

Many useful circuits can be found on drive T.

- T:\Art & Design\DesignTech\GCSE Design and Technology (2017)\1 TECHNICAL PRINCIPLES\3 in-depth knowledge\electronic systems
- T:\Art & Design\DesignTech\Electronics\Circuit Wizard\example circuits

Recommended reading & activities list:

If you have time, browse the Core Concepts document available here:

<http://resources.eduqas.co.uk/Pages/ResourceSingle.aspx?rId=937>

Deadline for Task: First lesson in the week commencing 10th September 2018

Required Stationery and Equipment for A Level Electronics

Pens, pencils, eraser, ruler and scientific calculator (not programmable)

Essential Resources

Essential:

None. All resources will be provided.

Useful:

1. Success in Electronics by Tom Duncan is a dated but useful resource for students who wish to read ahead on the topic of analogue circuits. It is not *essential* reading but could be a useful resource to occasionally dip into for some topics (e.g. audio amplifiers). The book is out of print but can be purchased second-hand on eBay (typically £3 – 5). You should not try to read it cover-to-cover as it contains some material outside the scope of this course.

Things to Consider Throughout the Year

Most resources will include student exercises, worked examples and past examination questions. It is essential that you attempt the exercises and exam questions independently as this will develop the necessary skills to pass the final exam with an excellent grade. Students who skip the exercises or work with a friend to answer the sample exam questions tend to perform poorly.