**Perth Academy**

**S3 Physics**

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**Basic Electronics**

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**Pupil Booklet**

* Learning Outcomes
* Homework
* Summary

SCN 4-09b

By contributing to investigations into the properties of a range of electronic components, I can select and use them as input and output devices in practical electronic circuits.

SCN 4-09c

Using my knowledge of electronic components and switching devices, I can help to engineer an electronic system to provide a practical solution to a real-life situation.

**How Confident am I with the Learning Outcomes?**

* Circle the faces to keep a record of your progress.

☺ I am confident that I understand this and I can apply this to problems

😐 I have some understanding but I need to revise this some more

☹ I don’t know this or I need help because I don’t understand it

* You can use this to help you pick the areas of the unit that need the most revision.
* As you revise your class work you will be able to circle more and more smiley faces.
* If that does not help then you should ask your teacher!

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| **Learning Outcomes**  | **Can you do this?** | **Comments** |
| **Electronic Systems** |  |  |
| 1. State that an electronic system consists of three parts: input, process and output.
 | ☹ 😐 ☺ |  |
| 1. Identify from a diagram the input, process and output subsystems of an electronic system.
 | ☹ 😐 ☺ |  |
| 1. Draw a block diagram showing the input, process and output subsystems of an electronic system.
 | ☹ 😐 ☺ |  |
| 1. Distinguish between digital and analogue outputs.
 | ☹ 😐 ☺ |  |
| 1. Identify analogue and digital signals from waveforms viewed on an oscilloscope.
 | ☹ 😐 ☺ |  |

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| **Input Devices** |  |  |
| 1. State that the microphone, thermistor, LDR, switch and solar cell are examples of input devices.
 | ☹ 😐 ☺ |  |
| 1. State the energy changes associated with these input devices.
 | ☹ 😐 ☺ |  |
| 1. State that the resistance of a thermistor changes with temperature.
 | ☹ 😐 ☺ |  |
| 1. State that the resistance of an LDR decreases as light gets brighter.
 | ☹ 😐 ☺ |  |
| 1. Identify from a list an appropriate input device for a given application.
 | ☹ 😐 ☺ |  |
| 1. Carry out calculations using voltage, current and resistance for the thermistor and the LDR.
 | ☹ 😐 ☺ |  |
| **Output Devices** |  |  |
| 1. Give examples of output devices and the energy conversions involved.
 | ☹ 😐 ☺ |  |
| 1. State that a buzzer, loudspeaker, lamp, LED, electric motor relay, solenoid and 7 segment display are examples of output devices.
 | ☹ 😐 ☺ |  |
| 1. Draw and identify the symbol for these output devices.
 | ☹ 😐 ☺ |  |
| 1. State that an LED will light only if connected one way round.
 | ☹ 😐 ☺ |  |
| 1. Explain the need for a series resistor with an LED.
 | ☹ 😐 ☺ |  |
| 1. State that different numbers can be produced by lighting appropriate segments of a 7 segment display.
 | ☹ 😐 ☺ |  |

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| **Process Devices** |  |  |
| 1. Draw and identify the symbols for two input AND and OR gates, and a NOT gate.
 | ☹ 😐 ☺ |  |
| 1. State that:

High voltage = logic 1Low voltage = logic 0 | ☹ 😐 ☺ |  |
| 1. State that for a NOT gate the output is the opposite of the input.
 | ☹ 😐 ☺ |  |
| 1. State that for an AND gate both inputs must be high for the output to be high.
 | ☹ 😐 ☺ |  |
| 1. State that for an OR gate either input must be high for the output to be high.
 | ☹ 😐 ☺ |  |
| 1. State that logic gates may have one or more inputs and that a truth table shows the output for all possible input combinations.
 | ☹ 😐 ☺ |  |
| 1. Draw the truth tables for two input AND and OR gates, and a NOT gate
 | ☹ 😐 ☺ |  |
| 1. Explain how to use combinations of digital logic gates for control in simple situations.
 | ☹ 😐 ☺ |  |