

## Electronics and Programming Basics -

### Reference to National Curriculum In England (2014), Ages 11-16

- Design and Technology

“Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others’ needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art.” (p. 88)

“Pupils should be taught to apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].” (p. 90)

- Art and Design

“Pupils should be taught to use a range of techniques to record their observations in sketchbooks, journals and other media as a basis for exploring their ideas.” (p. 81)

- Computing

“A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming.” (p. 85)

“Pupils should be taught to use two or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions.” (p. 86)