# Lesson 13 – Smart Traffic Lights Activity 1

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| The Big Picture – Why Is This Relevant? | Learning Objectives |
| * Considering current and future use of technology and the development of the smart city * Considering the technical, moral and ethical implication | * Apply your understanding, computational thinking and programming skills to achieve a goal * Design and create a traffic light system that works like a real traffic light |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Show examples of different traffic lights * If possible show clips of minor accidents at lights * Students will enjoy seeing the problems and then trying to solve or replicate these situations with their vehicle | **Expected Progress:**   * Students create an automatic traffic light system which cycles through the three colours   **Good Progress:**   * Students are able to adjust settings and refine their program to stop the car at the right point   **Exceptional Progress:**   * Students use additional sensors to make the system more effective for both human and autonomous drivers |
| Links to KS3 Programme of Study | |
| * design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems | |
| Key Concepts | Key Words |
| * Designing algorithms to solve problems * Breaking a problem down into easy to solve sections | * Autonomous * Sequence |
| Differentiation | Resources |
| Some students will want to stop once the vehicle stops.  Encourage them to think about where it stops and how other sensors could be utilised. | * Lesson 13 ppt * Lesson 13 Activity Sheet * Bit:Bot * PC * Access to <https://makecode.microbit.org> * Paper planning * Two micro:bits per group * LEDs or NeoPixel strips. If students do not have access to LEDs an alternative could be outputting and combination of R (for red), A (for amber) and G (for green) on the build in LEDs on the micro:bit. |
| Lesson Flow | |
| * Share objectives and remind students of the project aim * Discuss and explore the current development of smart traffic lights and smart cities. Two examples are on slide 3 * Get students to draw a flowchart for a normal traffic light * Get students thinking about how normal lights could be modified to support autonomous vehicles * Ensure students know the traffic light sequence and that different countries have different layouts – explore issues this might lead to with autonomous cars * Introduce the Traffic Light Worksheet * Encourage students to complete the Stretch Tasks and combine their use of sensors * Give students an opportunity to use LEDs or Neopixels to create the light sequence | |
| Making | |
| * Plan for a traffic light * Create traffic light system that incorporates micro:bit to stop autonomous cars | |