

Homework Handout **Answer Key**

Reflection Questions

In your notebook, respond to the following questions. Leave space to make additions and revisions at a later time.

1. For each of the following functions, explain what they do and how they work (what must go in between the parentheses). Then, give an example of how you would use each one in a line of code (separately).
 - a. pinMode()
 - b. digitalWrite()
 - c. analogWrite()
 - d. delay()

For complete descriptions and examples of each of these functions (and more), refer to the *Common Functions for Arduinos Handout*.

2. From a physics perspective, what is happening at a pin when the Arduino turns on the LED? Discuss/explain using the terms voltage & current.

(Specifically referring to the setup in Activity 2) When digital pin 10 is turned to “HIGH” (5V), a potential difference now exists across the LED and resistor (5V) and an electric field is induced in the wire. This causes charge to start to move through the wire, creating a current. Using conventional current, charge flows from digital pin 10 to the GND pin. Using electron current, electrons flow from GND to digital pin 10. This current through the LED causes light to be produced.

3. Many electronic devices have microcontrollers. Find two in your home or school that control actuators. Identify the electronic device (“What is it?”), its purpose (“What is it used for?”), and the actuators connected to it.

Many household items have microcontrollers in them. For example, the microcontroller in a blender controls the speed of a motor that spins blades (for fancier blenders that have LEDs or LCD displays, the microcontroller controls those as well). Digital thermometers possess microcontrollers that collect readings from a temperature sensor, and then usually output that information to a simple LCD display.