All-in-one Die:
Desc:

A 3D printed case will house a device that uses a sensor to detect when someone shakes it. In response to the motion, an ATmega328P will generate a random number and output the result on a LCD screen, mimicking the act of someone rolling a die. There will be a dial on the side to select which type of die the person would like to roll. The types of die will range from D4 up to D20. Rolling a 1 on a D20 tends to have undesirable consequences in tabletop gaming therefore, the device will output a negative response on a speaker. This will require the processor to store a sound file to be played when a 1 is rolled.

Controller: ATmega328P
Actuators: Speaker, LCD screen (or 7-segment), button or dial
Sensors: Accelerometer

Farm Bot:
Desc:

A self watering and lighting system used for when a user is too busy to care for their plants. An ATmega328P will be used to control the amount of light emitted from LED grow lights as well as water the plant via a water pump connected to a relay. To sense the amount of light, a photoresistor connected to the controller will be used. To sense the amount of water, a soil moisture sensor will be connected to the controller.

Controller: ATmega328P
Actuators: lights, water pump/mister
Sensors: Light sensor, moisture sensor

Replacement Piano Key:
Desc:

A single button sensor that could be attuned to a specific note that you set it as. There would be buttons to adjust the tone to get the note the user wants, and then when the “key” button is pushed, it would play that set tone.

Controller: ATmega328P
Actuators: speaker
Sensors: buttons