These are microcontrollers.

* Arduino
  + 8-bit, 16MHz, 32KB flash, 2KB RAM
* mBed
  + 32-bit, 96MHz, 512KB flash, 64KB RAM, ARM
* Raspberry Pi
  + 32-bit, 900MHz, Expandable SD Flash, 1GB RAM, ARM

Well suited for controlling physical devices, can be found in:

* TV Remote
* Garage Door Opener
* Thermostat
* Appliances
  + Dishwasher
  + Washer/Dryer
  + Set-Top Box
  + Traffic Counter, doors

Examples:

* Pi Calculation
  + Generating random numbers used in Monte Carlo simulation
  + Calculating Pi
  + Output to LCD
* Monty Hall Paradox
  + Chooses random door [1, 3]
  + Player chooses a door
  + Host removes one losing door
  + Player stays or switches
  + Win/lose displayed
* Robot Chassis
  + Arduino variant board with built in circuitry for dealing with high-current

demands of electric motors

* Bump sensors, infrared emitters/detectors for line following
* Accelerometer
  + Tilt of one axis displayed with servo, the other with LEDs
* ATtinies
  + First: Reading value of variable resistor, value used to set time between blinks
  + Second: Controlling seven segment displays that scroll “EDGE”
  + Third: Reading value of photoresistor, dims LED when shaded.
* Lilly Twinkle
  + Wire LEDs with conductive thread, blinks LEDS in twinkle pattern for wearable

Electronics –Halloween

Differentiate Fun/Serious Examples from Serious/Academic examples

* Leaning Tower likely controlled by something similar to these microcontrollers
  + Sense button press
  + Control motor that turns screw
  + Ball release mechanism
  + Displays
* Is anyone following the recent Volkswagen emissions scandal? Anyone own an affected car?
  + Diesels sold since 2009 have software installed in ECM that cheat emissions tests
* Has anyone ever noticed the four lights on the left side of a runway?
  + Precision Approach Path Indicator

Calling an Atmel328 and Arduino is akin to calling your cell phone and iPhone.