

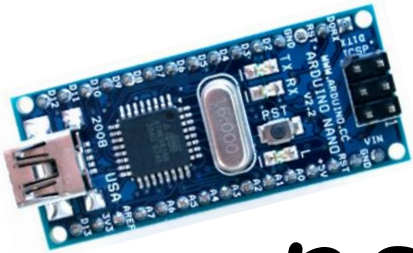
3E GADGETS

Electronics, Arduino & You

What is
the
Arduino

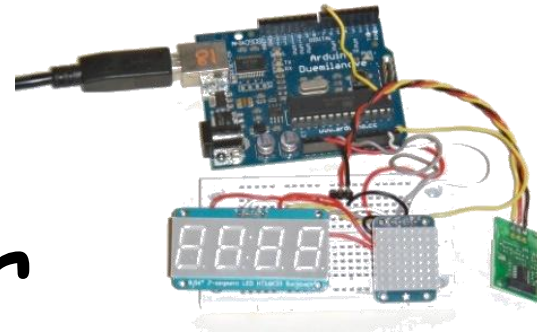


Basically, an electronic processor that takes inputs from sensors, performs processing and controls outputs accordingly.



Arduino Platform

- Microcontroller
- Serial Bootloader
- Integrated Design Environment (IDE)
- Philosophy



```
Arduino - 0011 Alpha
File Edit Sketch Tools Help
Blink
/*
 * Blink
 *
 * The basic Arduino example. Turns on an LED on for one second,
 * then off for one second, and so on... We use pin 13 because,
 * depending on your Arduino board, it has either a built-in LED
 * or a built-in resistor so that you need only an LED.
 *
 * http://www.arduino.cc/en/Tutorial/Blink
 */

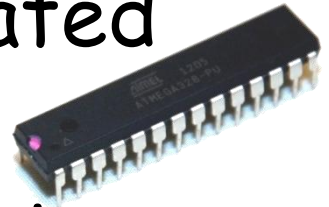
int ledPin = 13;           // LED connected to digital pin 13

void setup()               // run once, when the sketch starts
{
  pinMode(ledPin, OUTPUT); // sets the digital pin as output
}

void loop()                // run over and over again
{
  digitalWrite(ledPin, HIGH); // sets the LED on
  delay(1000);                // waits for a second
  digitalWrite(ledPin, LOW);  // sets the LED off
  delay(1000);                // waits for a second
}
```

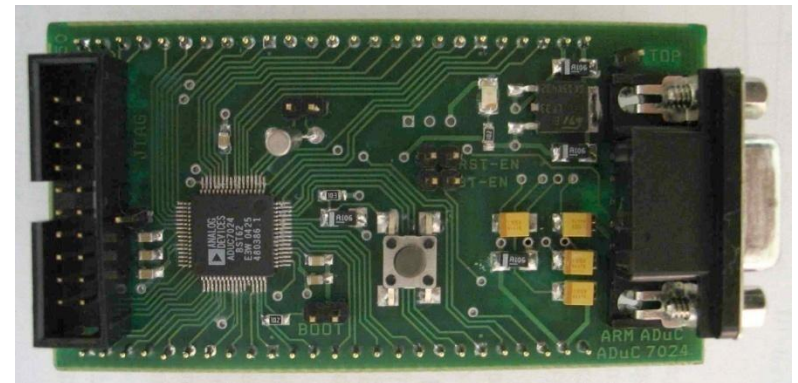
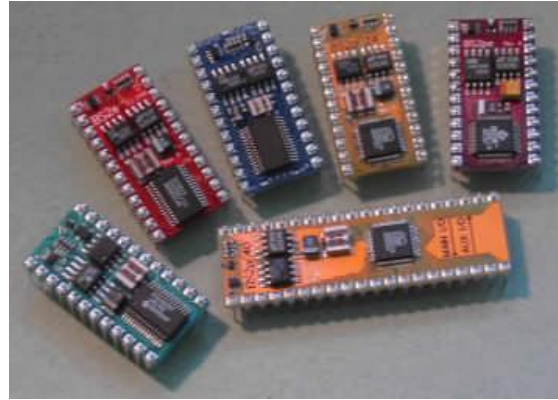
A Microcontroller is ...

- Also called Microcontroller Unit or MCU or μC or embedded controller
- A small computer on a single Integrated Circuit (IC)
- Consist of single CPU, digital and analogue inputs & outputs (I/Os) & memory
- Found in many every-day products such as micro-wave ovens, phones, clock and etc.....

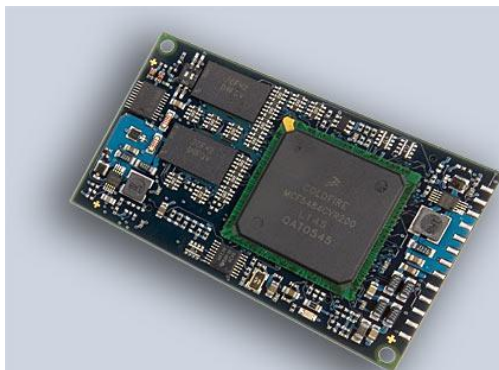


Microcontrollers out there

- Atmel
- Microchip
- Freescale
- Toshiba
- Zilog



zilog



3E GADGETS

A Bootloader is ...

A program already on the microcontroller that facilitates device programming using only the USB port and cable

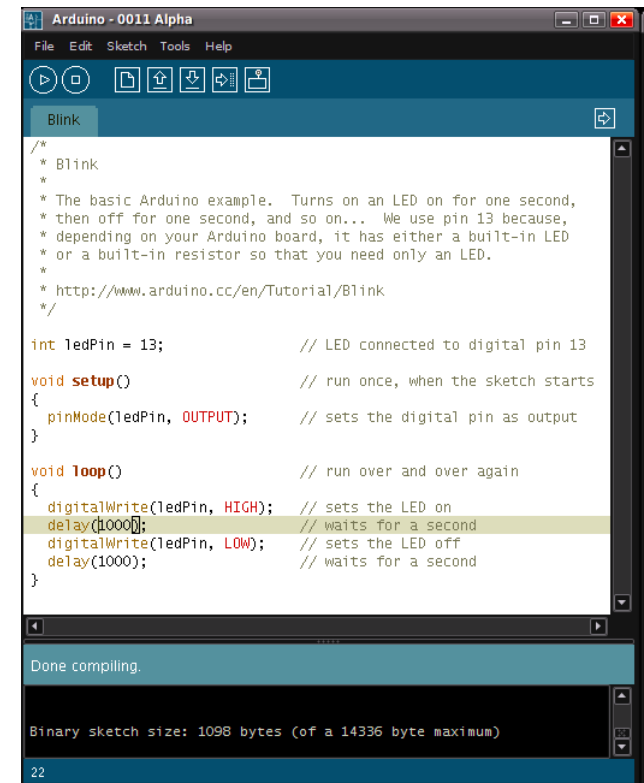


instead of dedicated programming device



Integrated Design Environment (IDE) is...

- An application program on the PC for program development
- Free, common, easy to use interface
- 'C' like language

A screenshot of the Arduino IDE interface. The window title is "Arduino - 0011 Alpha". The menu bar includes "File", "Edit", "Sketch", "Tools", and "Help". Below the menu bar are icons for running, stopping, saving, and other functions. The main text area shows the code for a "Blink" sketch. The code includes comments explaining the setup and loop functions, and the actual code for setting pin 13 as an output and toggling it on and off with 1000ms delays. The status bar at the bottom shows "Done compiling." and "Binary sketch size: 1098 bytes (of a 14336 byte maximum)". The page number "22" is visible in the bottom right corner of the IDE window.

```
Arduino - 0011 Alpha
File Edit Sketch Tools Help
Blink
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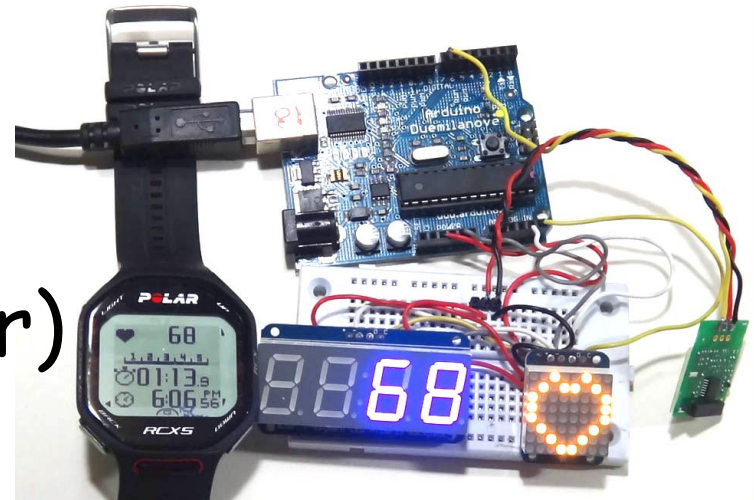
Done compiling.

Binary sketch size: 1098 bytes (of a 14336 byte maximum)

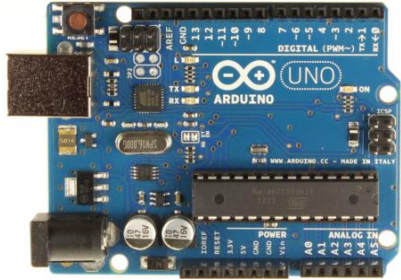
22
```

Philosophy

- Show you that it is easy to make something from readily available parts hoping you'll be inspired to start making and creating
- Related to the Maker movement and the Open-source movement
- Encourages Creativity
- Non-intimidating
- Play & experiment (tinker)



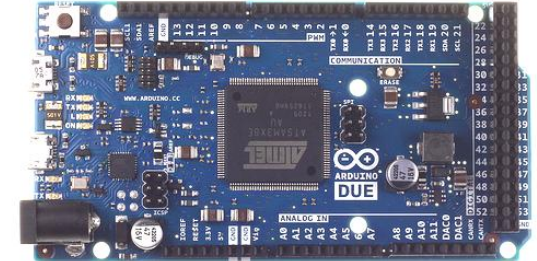
Some Arduino Boards (from arduino.cc)



Arduino Uno



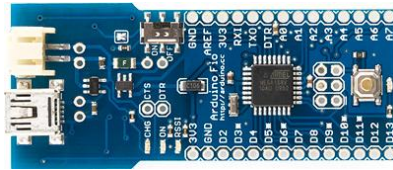
Arduino
Mega
2560



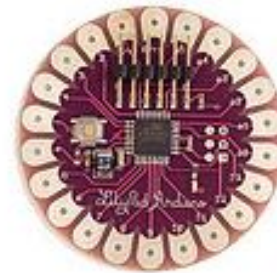
Arduino Due



Arduino Nano



Arduino Fio

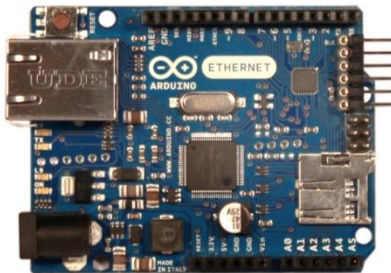


Arduino LilyPad



Arduino Pro Mini

Arduino
Ethernet

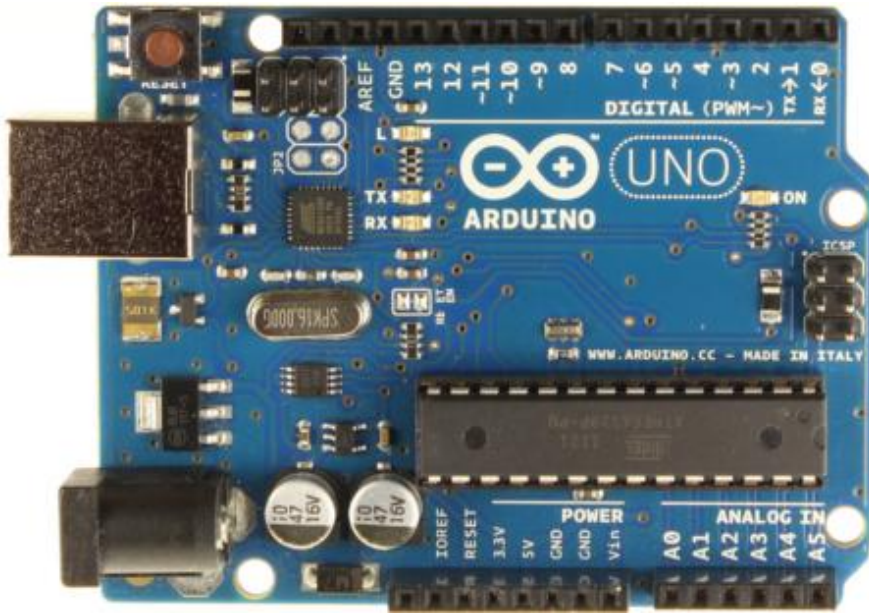


Arduino Micro

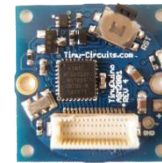


Arduino Pro

Tiny Arduino Board

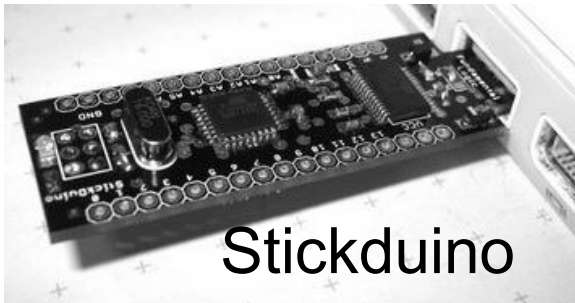


Arduino Uno

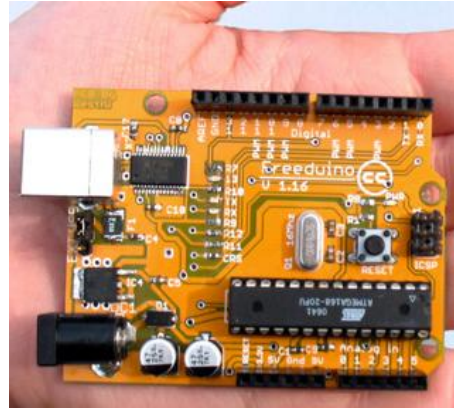


TinyDuino

Arduino 'cousins'



Stickduino

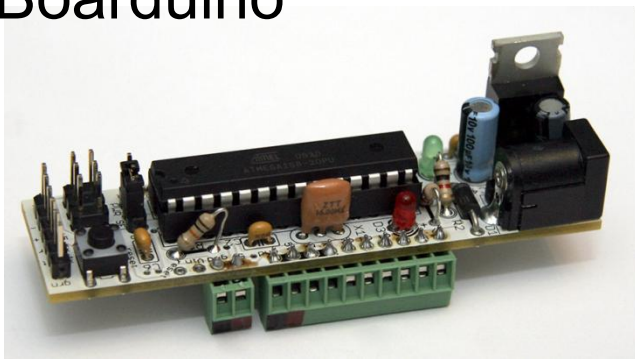


Freeduino

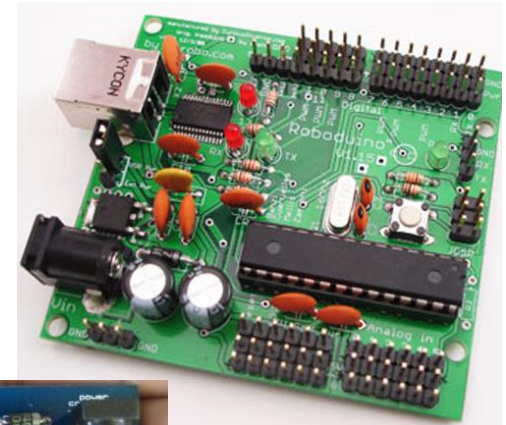
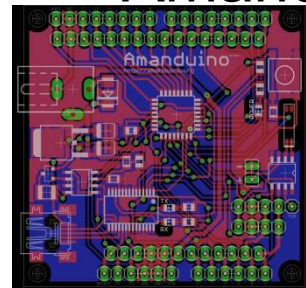
Single-sided



Boarduino



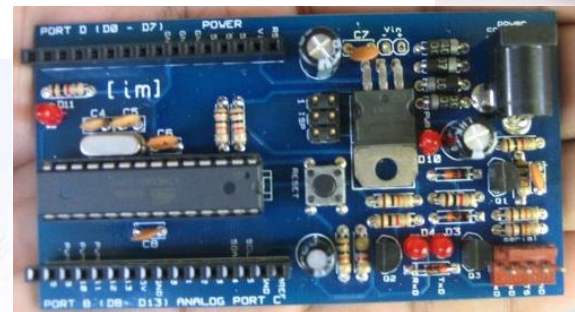
Amanduino



Roboduino



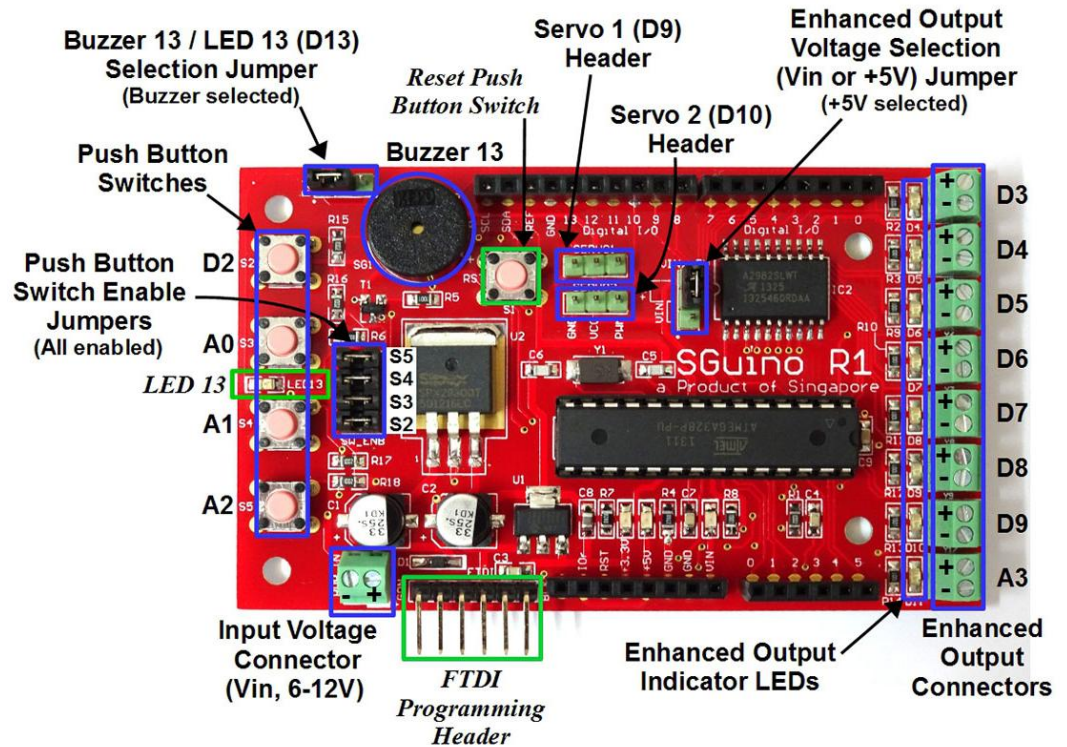
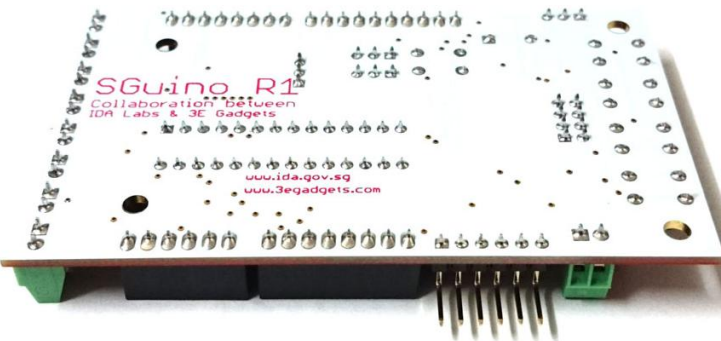
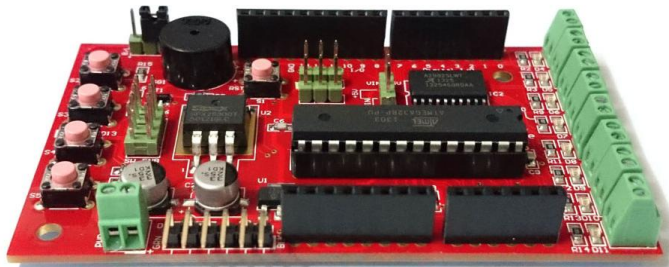
Really bare bones board



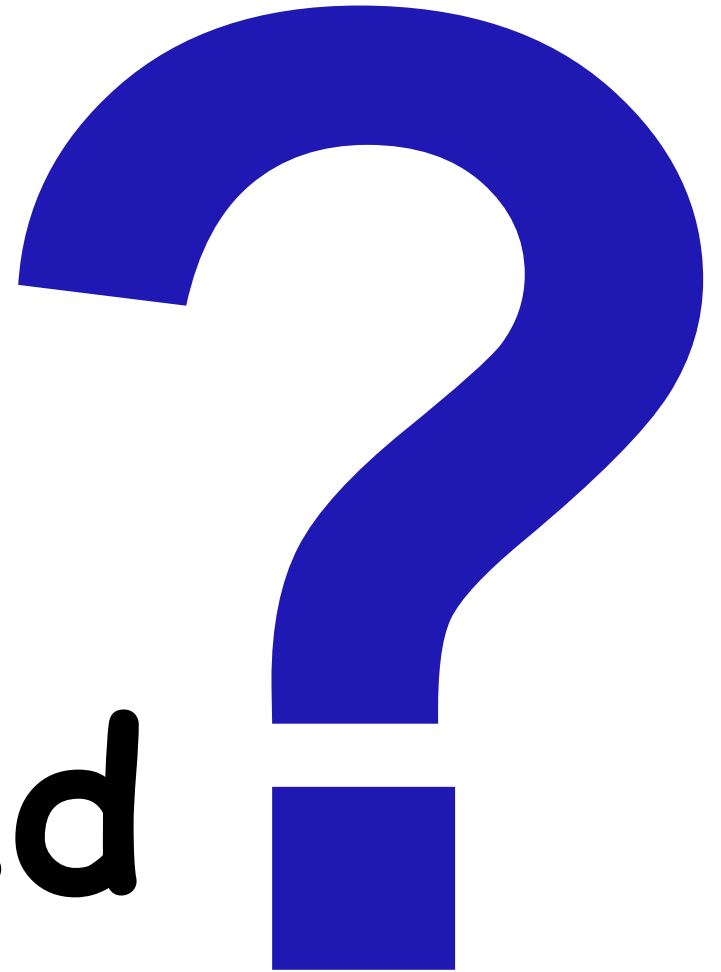
[im]Duino

SGuino : Singapore's Arduino

(From 3E Gadgets, launched in 2014)



What
can be
connected



Arduino can be connected to...

LED



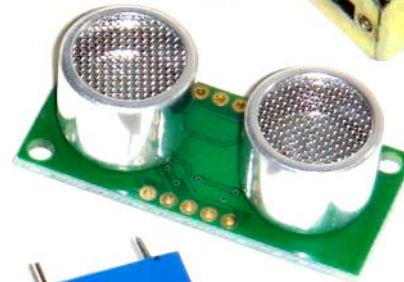
Switch



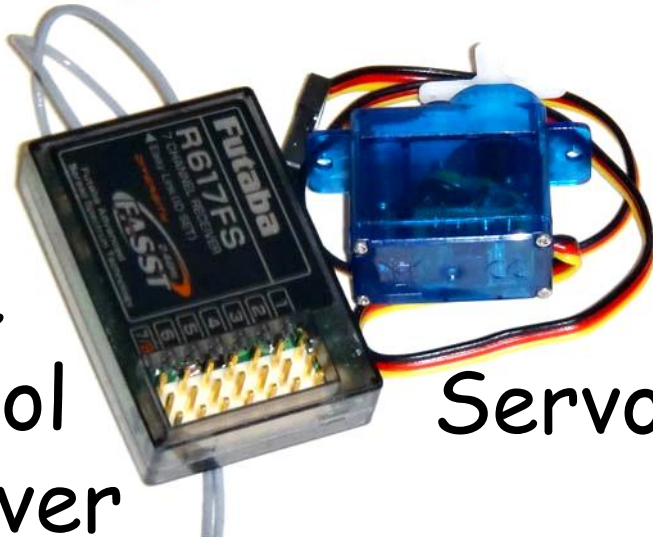
Potentiometer



Sensor



Remote
Control
Receiver



Servo



Relay

and many many many more

What
can be
made



Iron Man Helmet



Foam structure



Arduino & Electronics



Completed
Helmet



Open Sesame



Close Sesame

The last
part is
YOU

**Are you
thinking about
creating
something**

