MODULE 10: Student Presentations

SUMMER CHALLENGE

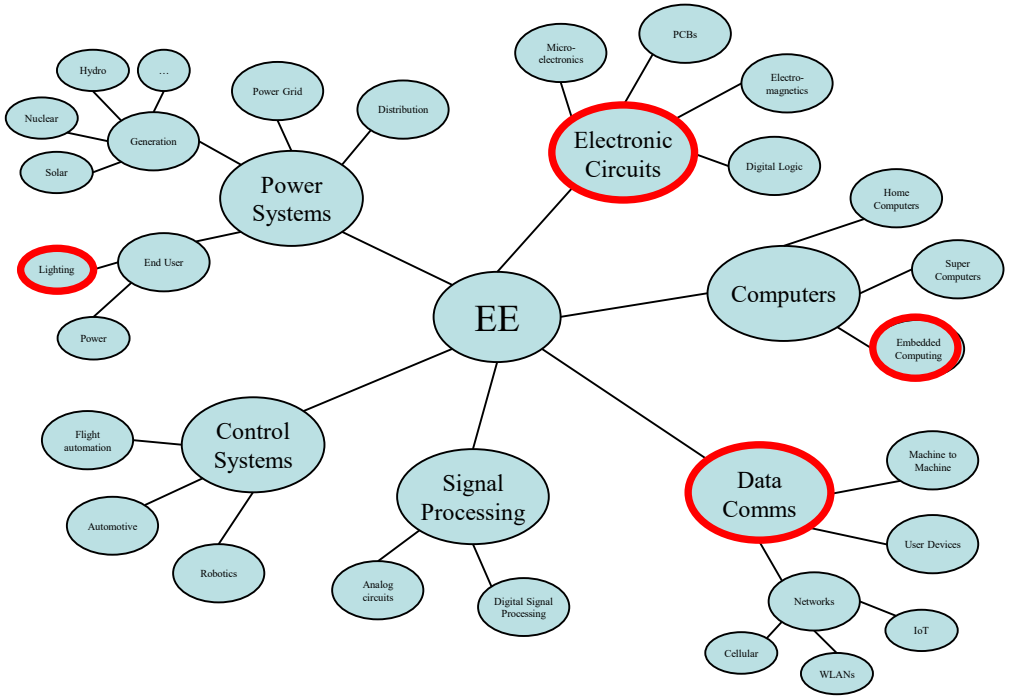
Electrical Engineering: Smart Lighting

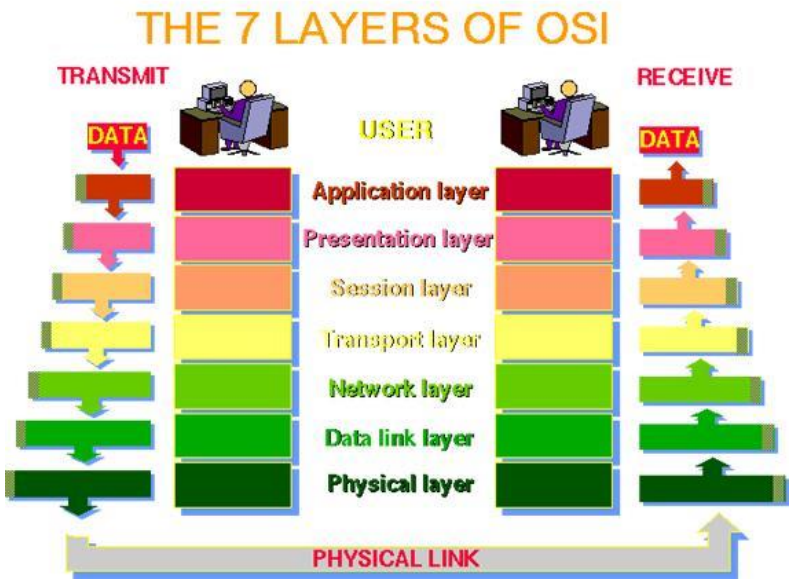
Emre Ates
PhD Student
Boston University
ates@bu.edu

BOSTON UNIVERSITY

We have covered…

- Electrical Engineering
- Communications
- Smart Lighting





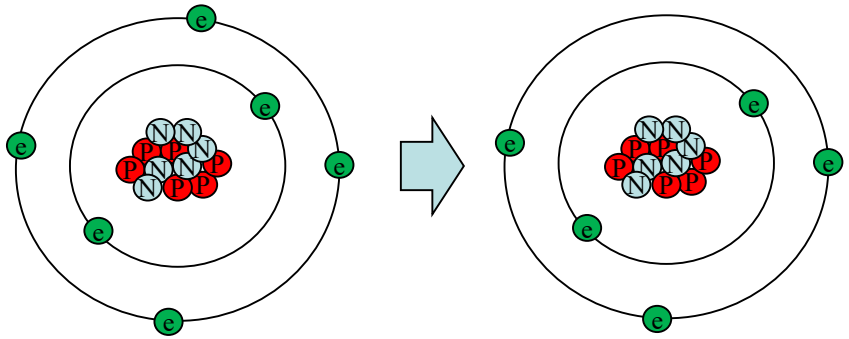
Common 60W Incandescent Bulb

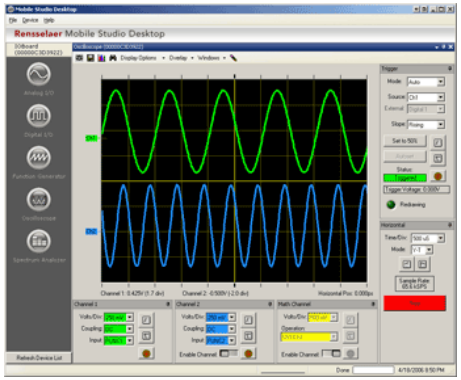
Common 14W CFL Bulb

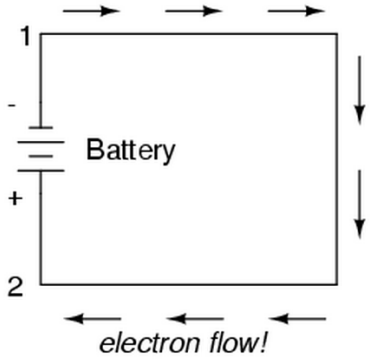
Philips 12.5W AmbientLED Bulb

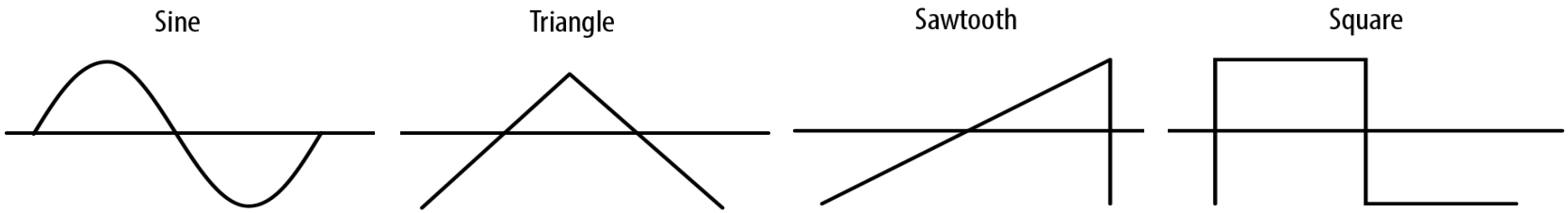
We have covered…

- Electricity
- Circuits
- Voltage
- Signals
- Tools



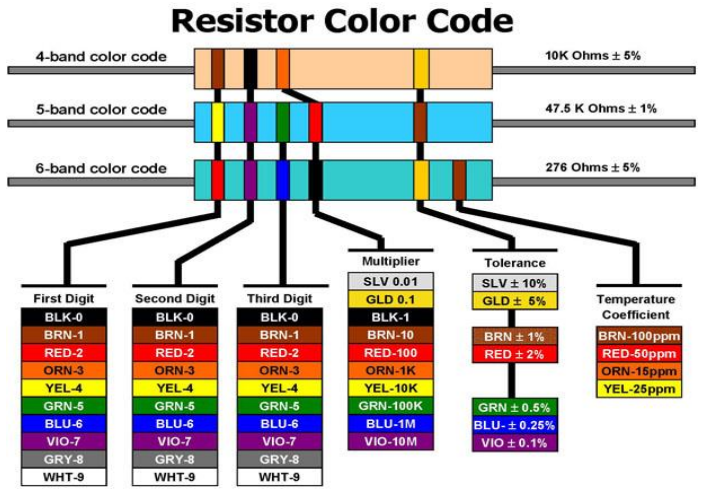


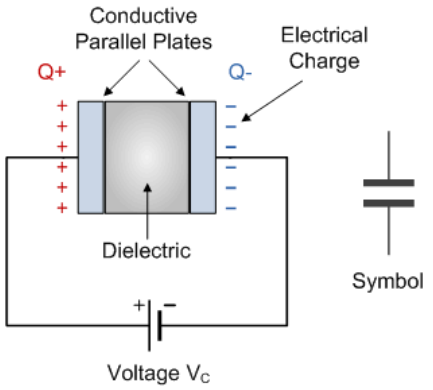


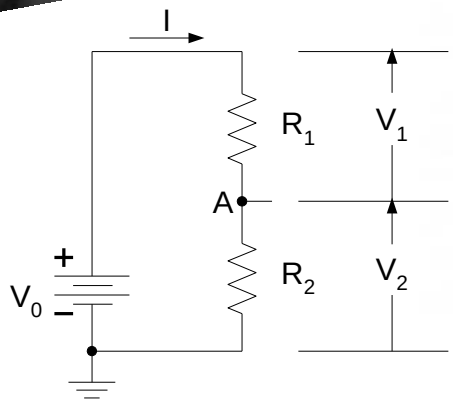


We have covered…

- Resistance and Resistors
- Ohms Law
- Capacitance
- Breadboards
- Voltage Dividers

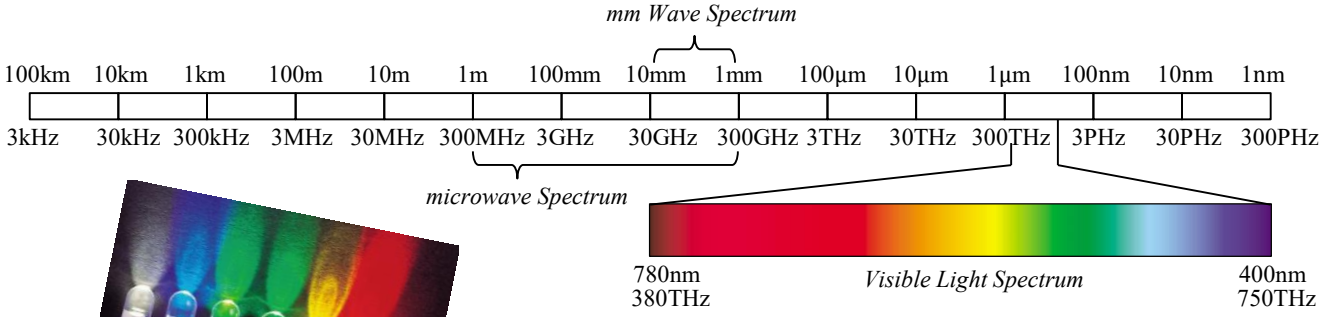


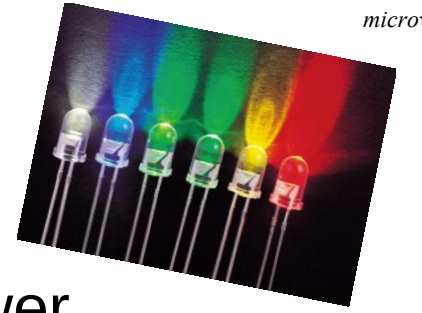




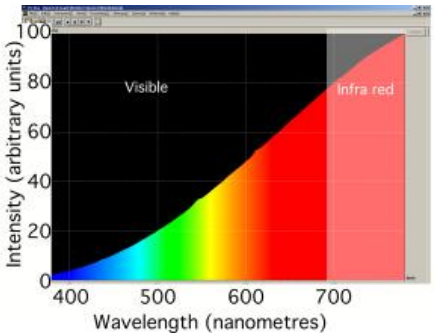
We have covered…

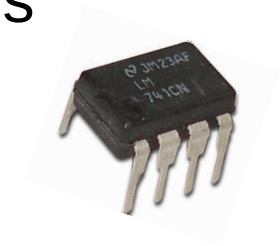
- Spectrum
- Lighting
- LEDs
- Electrical Power
- Photodiodes
- ICs

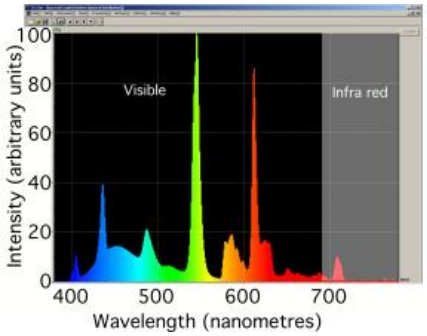


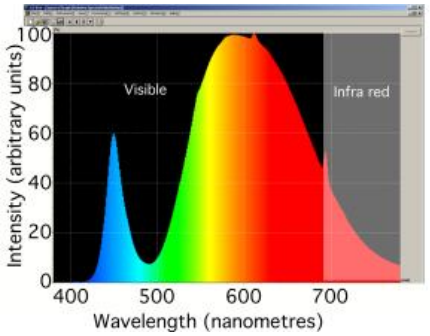


$$P = VI$$

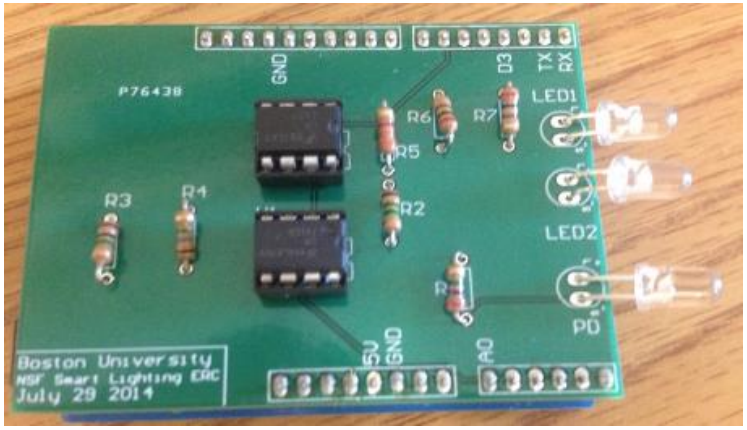




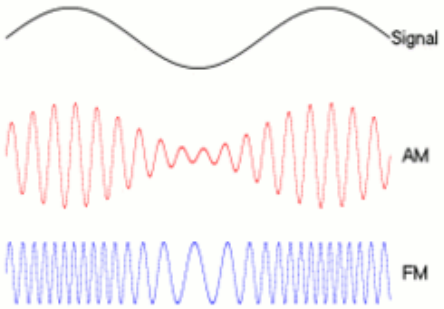


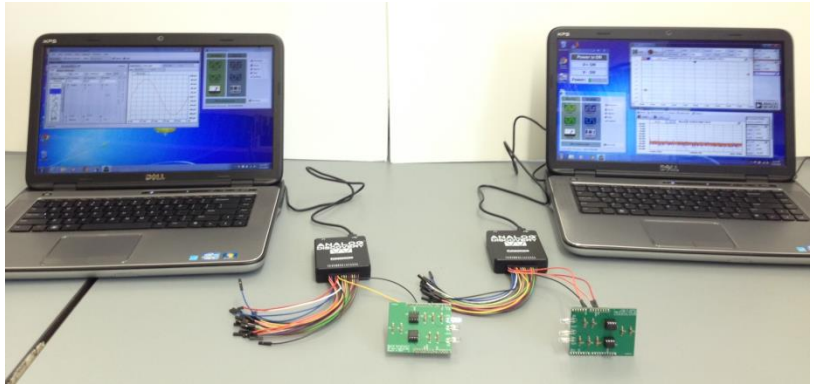


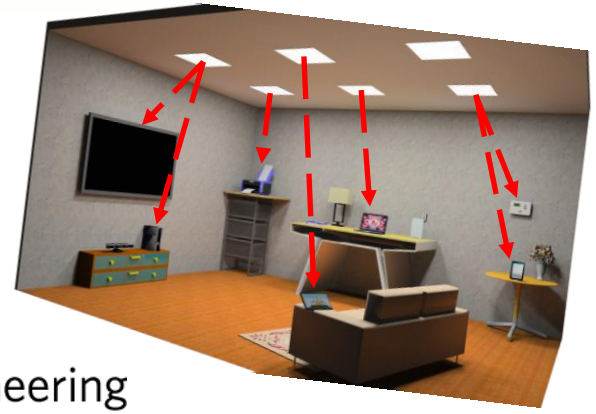
We have covered…



- PCBs
- Soldering
- Visible Light Communication
- AM / FM
- Audio Communication

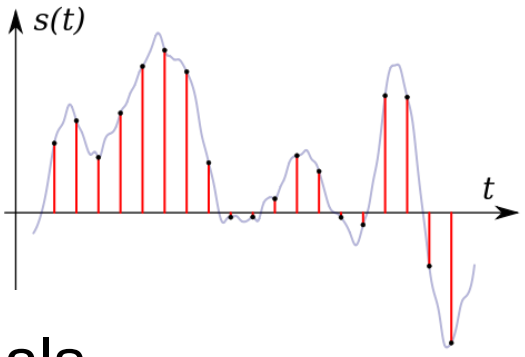




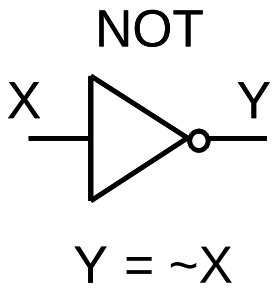


We have covered…

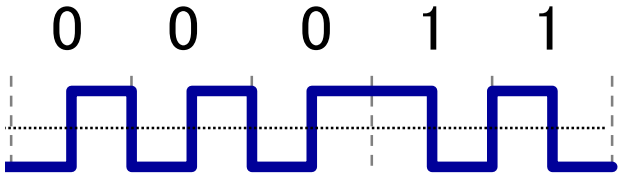
- Binary
- Ascii
- Digital Signals
- Digital Logic
- Modulation



Binary Form					Decimal Form
16	*8*	*4*	*2*	*1*	
0	0	0	0	0	0
0	0	0	0	1	1
0	0	0	1	0	2
0	0	0	1	1	3
0	0	1	0	0	4
0	0	1	0	1	5
0	0	1	1	0	6
0	0	1	1	1	7
0	1	0	0	0	8
1	0	0	0	0	16
1	1	1	1	1	31

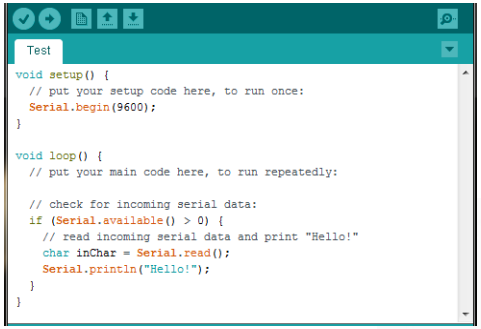


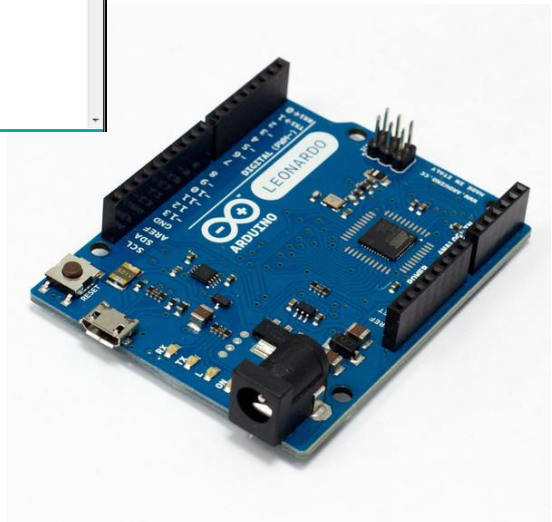
0	0011 0000	O	0100 1111	m	0110 1101
1	0011 0001	P	0101 0000	n	0110 1110
2	0011 0010	Q	0101 0001	o	0110 1111
3	0011 0011	R	0101 0010	p	0111 0000
4	0011 0100	S	0101 0011	q	0111 0001
5	0011 0101	T	0101 0100	r	0111 0010
6	0011 0110	U	0101 0101	s	0111 0011
7	0011 0111	V	0101 0110	t	0111 0100
8	0011 1000	W	0101 0111	u	0111 0101
9	0011 1001	X	0101 1000	v	0111 0110
A	0100 0001	Y	0101 1001	w	0111 0111
B	0100 0010	Z	0101 1010	x	0111 1000
C	0100 0011	a	0110 0001	y	0111 1001
D	0100 0100	b	0110 0010	z	0111 1010
E	0100 0101	c	0110 0011	.	0010 1110
F	0100 0110	d	0110 0100	,	0010 0111
G	0100 0111	e	0110 0101	:	0011 1010
H	0100 1000	f	0110 0110	;	0011 1011
I	0100 1001	g	0110 0111	?	0011 1111
J	0100 1010	h	0110 1000	!	0010 0001
K	0100 1011	I	0110 1001	'	0010 1100
L	0100 1100	j	0110 1010	"	0010 0010
M	0100 1101	k	0110 1011	(	0010 1000
N	0100 1110	l	0110 1100	)	0010 1001
				space	0010 0000

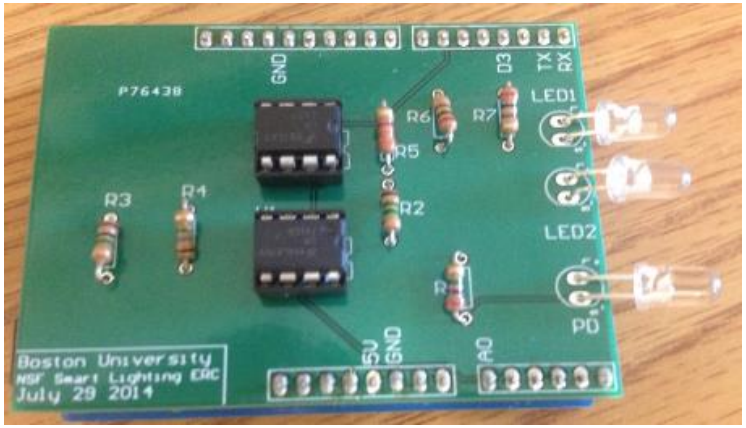


We have covered…

- Software
- Arduino Microprocessor
- Optical Communication

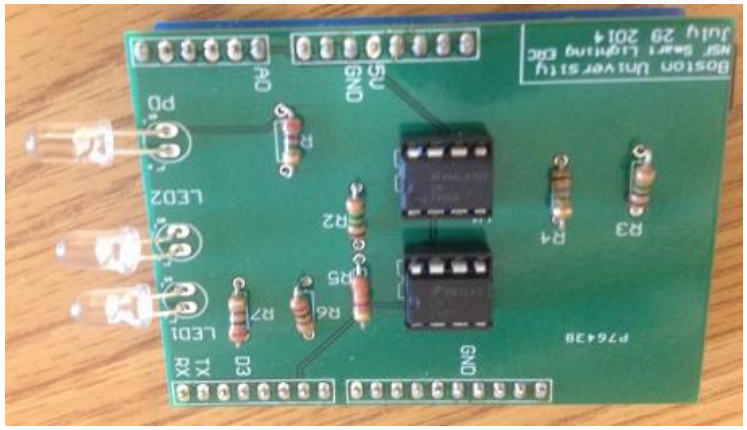






Link 1

Link 2



We have covered…

A LOT

Reference Websites

- Physics Classroom: www.physicsclassroom.com
- All About Circuits: www.allaboutcircuits.com
- Khan Academy: www.khanacademy.org
- Code Academy: www.codecademy.com
- Arduino: www.arduino.cc/
- Digilent Course:

  www.digilentinc.com/Classroom/RealAnalog/