



**The 3rd Belt and Road Teenager
Maker Camp & Teacher Workshop**

THE ART OF ELECTRONIC CIRCUIT

**SEPTEMBER 24-30, 2019
GUANGXI · CHINA**



What is Electronic technology?

Electronic technology is based on the principle of electronics, using electronic components to design and manufacture a specific function of the circuit to solve practical problems, including information electronics technology and power electronics technology. Information electronics technology includes analog electronics technology and digital electronics technology. Electronic technology is the technology of processing electronic signals. The main ways of processing are signal generation, amplification, filtering and conversion.

This development of human electronic technology originated from the study of electromagnetic phenomena. Many ancient civilizations, including China, ancient Greece and ancient Egypt, have recorded the observation and study of friction electrostatic, bioelectricity and natural magnets in ancient books.

This advances have been slow for thousands of years. It was not until the 17th century, marked by the first friction starting motor (1660) that people began to study electrostatics. The invention of a voltaic reactor (1800) enabled scientists to conduct electrical research using a steady current. In the 19th century, with the discovery and advancement of a series of important electromagnetic theories, such as Ampere's electromagnetic theorem, Faraday's law of electromagnetic induction and Maxwell's theory of electromagnetic field, the development of physics was rapidly promoted and the second industrial revolution was initiated. In the 20th century, with the popularization of electric power and the tremendous promotion of electronic technology by the two world wars, electronic technology has entered thousands of households along with radio, television and electronic equipment in various cities.

The high development and wide application of electronic technology (such as space electronic technology, biomedical electronic technology, information processing and remote sensing technology, microwave application, etc.) have also played a revolutionary role in promoting the development of social productivity.



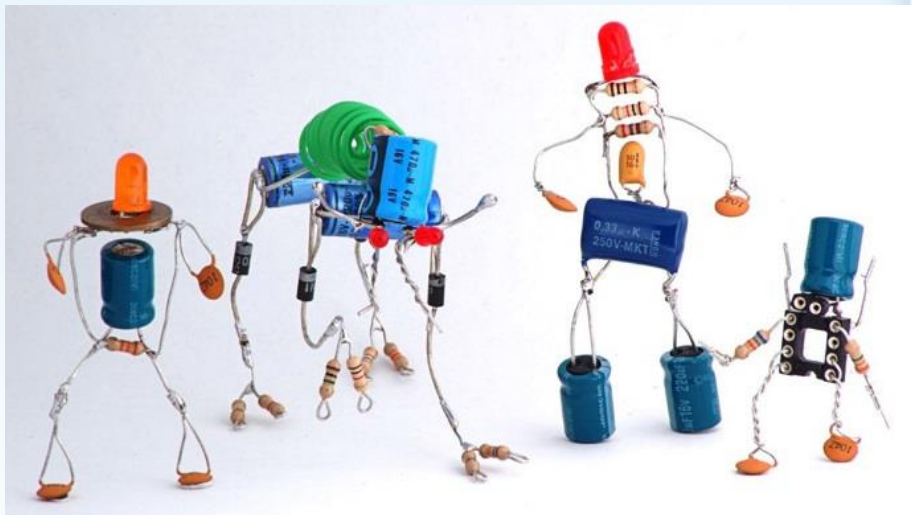
What are we going to learn in this course?

Electronic technology is a classical subject which has developed for hundreds of years and has complete categories and perfect theory. Although the electrical appliances we use and touch now, such as mobile phones, have entered the era of large-scale integrated circuits, the complexity of which is far beyond the ability of ordinary people and even ordinary electronic technology enthusiasts to modify and master. Just as all tall buildings are built from the ground, analog electronics technology is an indispensable basic knowledge.

What we need to learn and experience in the next limited time is: Learn to use common tools for electronic production Understanding and identifying common basic components

- Learn basic analog circuit knowledge
- Learning the Method of Driving Motor
- Learn to use modular circuits

At the end of the course, we will work together to create a work that combines electronic technology and art.





Activity 1: Electronic Paper Crane

Activity materials:

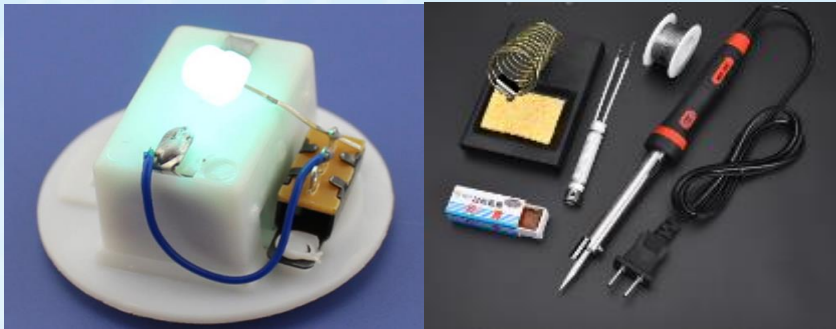
- Colored paper
- Color LED, Wire, Battery Box, Switch
- Electric iron, rosin, solder wire
- Hot Melt Gun, Hot Melt Gun

Technological process:

1. Learn how to fold a thousand paper cranes according to the teacher's instruction.



2. Connect the LED circuit according to the teacher's instruction and successfully light up.



3. Try other ways of combining paper crane with circuit



Activity 2: Head-Shaking Rose

Activity materials:

- Colored paper
- Color LED, Wire, Battery Box, Switch
- Electric iron, rosin, solder wire
- Hot Melt Gun, Hot Melt Gun

Technological process:

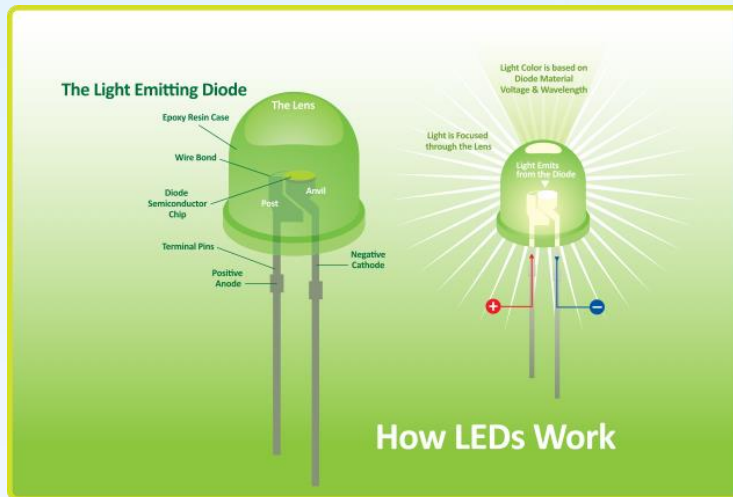
1. According to the teacher's instruction, learn to fold paper roses;



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2. Connect the LED circuit according to the teacher's instruction and successfully light up.



3. Connect the motor to make the rose move. The circuit is simply a motor connect to a battery through wire, with or without a switch. Or you can use the motor control by a preprogrammed Arduino board.

4. Try other ways of combining paper roses with circuits



Activity 3: Programmed Lamp

Material Science:

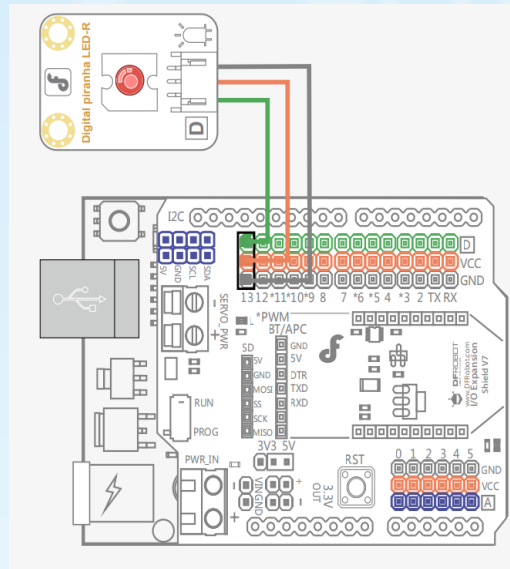
- Electric soldering iron
- Solder wire
- Multimeter
- Tweezers, scissors
- Arduino Board
- Led Module

Process:

1. Follow the instruction, try to figure out to program for Arduino Board and download the programme into it.
2. Connect the Led module to the board. Solder it if needed.
3. Try to make it Breathing or Flashing.
4. Try to make some decoration with the 'Lamp'.



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STEM Project: Desktop Electronic Art -works

Make an electronic artwork that can be placed on your desktop or in your living room.

Evaluative Dimension	
Scientificity	The process of project design and making should be scientific and reliable.
Creativity	In one or more aspects of project design and making, etc. the team should show strong creativity.
Teamwork	Task allocation should be clear and cooperation should be in order.
Practicability	Projects should be of use in reality.
Expression	1.The presentation should be clear and brief; 2.Understanding the basic scientific principles related to the project; 3.The extent to which work is carried out independently; 4. Answering questions clearly and briefly.



Project Sheet

(Only one sheet needed for each group)

Name of your group	
Member of your group	
Design Chart (Including the overall modeling picture, and the design of each part)	



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<p>Materials List</p>	
<p>Personnel division (List the division of work for each person in your group. Note that one of them needs to act as a spokesperson to speak on behalf of your group.)</p>	