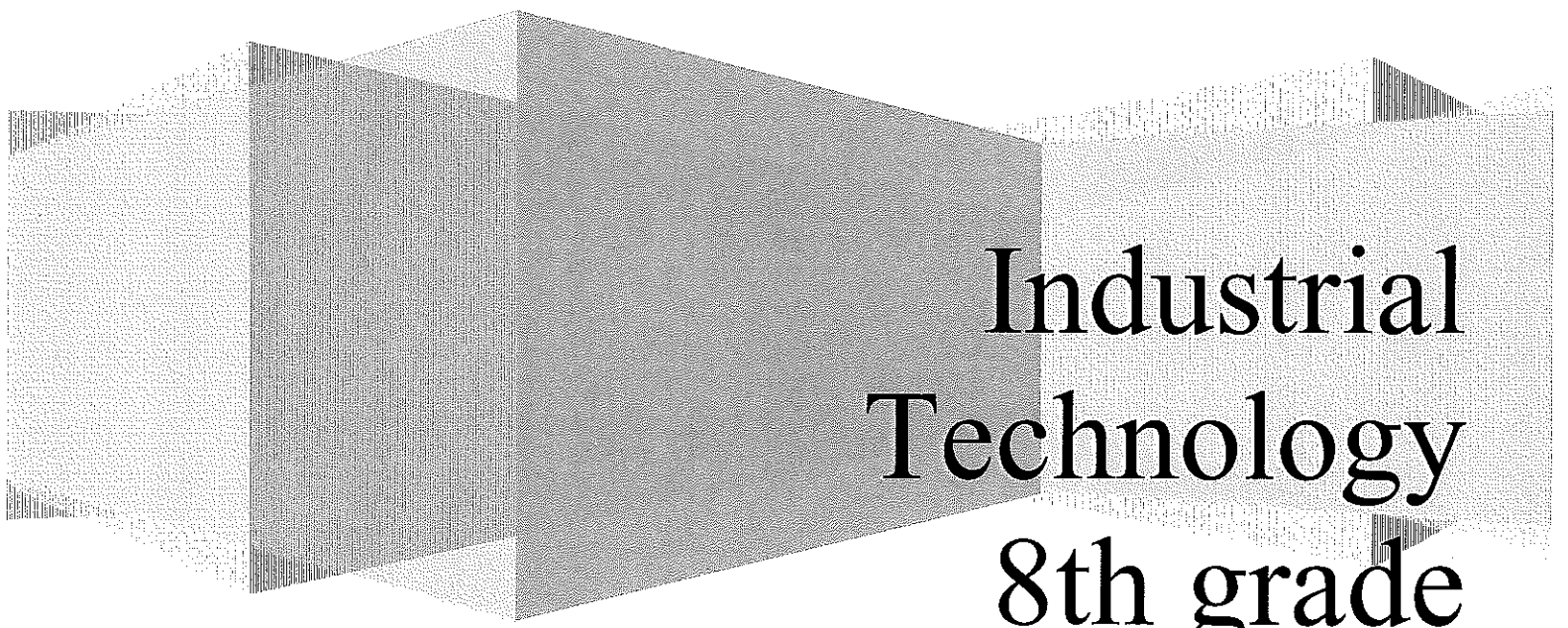


Solon Board of Education

Electronics

Basic electronic principles

By: Mrs. Aughinbaugh, Instructor



**Industrial
Technology
8th grade**

Electronics Module Introduction

Interdisciplinary Skills

The *Electronics* module reinforces various skills that you learn in other classes:

Technology involves the practical application and use of math and science. Some of the interdisciplinary skills

Implemented in this module are:

Language Arts

- Read daily instructions for comprehension
- Read text excerpts for comprehension
- Gather and record information
- Expand language communication skills by learning new vocabulary words
- Explore electricity and electronics terminology
- Summarize daily activities (Activity Journal Entry option)

Math

- Read a schematic diagram and graphic symbols
- Read an analog multi-meter (resistance, voltage, current, battery charge, testing transistors, and diodes)
- Interpret Ohm's law (voltage equals current times resistance: $E = IR$)

Problem-solving

- Experiment with electronic components and construct electronic circuits
- Develop basic meter-reading skills with an analog multi-meter

Science

- Understand the types and uses of basic electricity (electricity involves the movement of electrons)
- Recognize basic types and parts of a complete electronic circuit (current, voltage, resistance)

- Identify and understand the uses of electronic components (transistors, resistors, speakers, diodes, capacitors, switches, integrated circuits, LED's, photocells)
- Experiment with circuit boards
- Learn about conductors (understand the principles of conduction and that all matter conducts electricity)
- Work with direct and alternating current (realize electrical current may travel along one or more paths)
- Examine volts, amperes, ohms, farads
- Study silicon chips and integrated circuits

Social Studies

- Explore how the science of electronics was developed
- Discover the development of electronic components
- Recognize the importance of electricity and electronics in society
- Identify the concepts and terms related to electronics
- Describe the technological significance of the silicon chip
- Discover careers related to electronics

Day One

Learning Target:

Determine prior knowledge with a K-W-L. (5pts)

Gain an understanding of the history and development electronics and electricity through video.

- Fill out the pre knowledge worksheet (K-W-L) to determine prior knowledge. Consider the following points as you fill in the worksheet.

Pre knowledge

- (K) What do you already know about this subject?
 - (K) What have you heard about this subject?
 - (W) What do you want to know about this subject?
- Get **Mr. Circuit** video from work area and
 - Watch the Electronics principles video for an introduction to the electronics. As you are watching the video listen for the key terms listed on the front of your packet. You may be able to define them on the terms sheet.
 - If time allows you may go on to the next day or clean up your area. Make sure you rewind the video and return all materials to their proper place.

Day closure:

In your technology journal write down one thing that you discovered today (Note: I will check journals randomly to make sure they are being completed daily for the 10 pts awarded.)

Day Two

Learning Target:

Define for understanding terminology of electronic components from list on packet. (10pts)

Read introductory pages and Complete questions within reading. (15pts)

- Using the orange Mr. Circuit book locate the rest of the definitions that you did not find in the video.
 - The terms can be found in the experiment explanation paragraphs that precede the experiment.
- Read the worksheet pages enclosed in your packet.
 - There are questions and drawings you must complete so read carefully.
- If time allows you may go on to the next day or clean up your area. Make sure you return all materials to their proper place.

Day closure:

- In your technology journal write down one thing that you discovered today

(Note: I will check journals randomly to make sure they are being completed daily for the 10 pts awarded.)

Days Three through Eight:

Learning Target:

Complete experiments with trainer to experience firsthand what each component does in the world of electricity. Each day below has which experiment you should be trying each day.

Keep a program record. (50 pts)

Write down name and page number of experiment

What did the experiment do or what was the outcome?

What components (other than wire or batteries) were used?

What is used from this experiment in real life? How do you know?

Teacher sign off on EACH experiment

Should complete at least 10 experiments

Reminder at the end of each period clean up and complete

Daily closure:

In your technology journal write down one thing that you discovered today (Note: I will check journals randomly to make sure they are being completed daily for the 10 pts awarded.)

Day Three

- Read the introductory pages in the Blue book located in the electronics trainer box.
- Make sure you have batteries in the back of the trainer.
- Log each experiment as listed above
- Experiment one. Select any experiment that uses an LED and complete it.
- For your first experiment you may want to complete the basic L.E.D. experiment. Refer to your book for page number.

Journal entry

Day Four

- Complete an experiment using a switch and pick one other experiment to complete.
- Keep a program record

Journal entry

Day Five

- Complete an experiment using a resistor.
- Complete an experiment using Transistor.

- Keep a program record

Journal entry

Day Six

- Complete an experiment using a photo cell.
- Keep a program record

Journal entry

Day Seven

- Complete an experiment using a Capacitor.
- Complete an experiment using Integrated Circuit.
- Keep a program record

Journal entry

Day Eight:

- Complete an experiment using a probe or lead.
- Complete an experiment using SCR.
- Keep a program record

Journal entry

Day Nine and Ten

Learning Target:

- Determine how and why a multi tester is used.
- Continue learning how each component works in a circuit with the use of the trainer.

Day Nine

- Complete an experiment using oscillator, or Potentiometer.
- On day nine or ten have the instructor show you how to use the multi tester. Determine how fresh your batteries are.
- Keep a program record

Journal entry

Day Ten

- Complete an experiment using a Diode.
- Keep a program record

Journal entry

Review for common assessment and make sure you have all papers necessary for completion of module ready for turn in prior to exam.