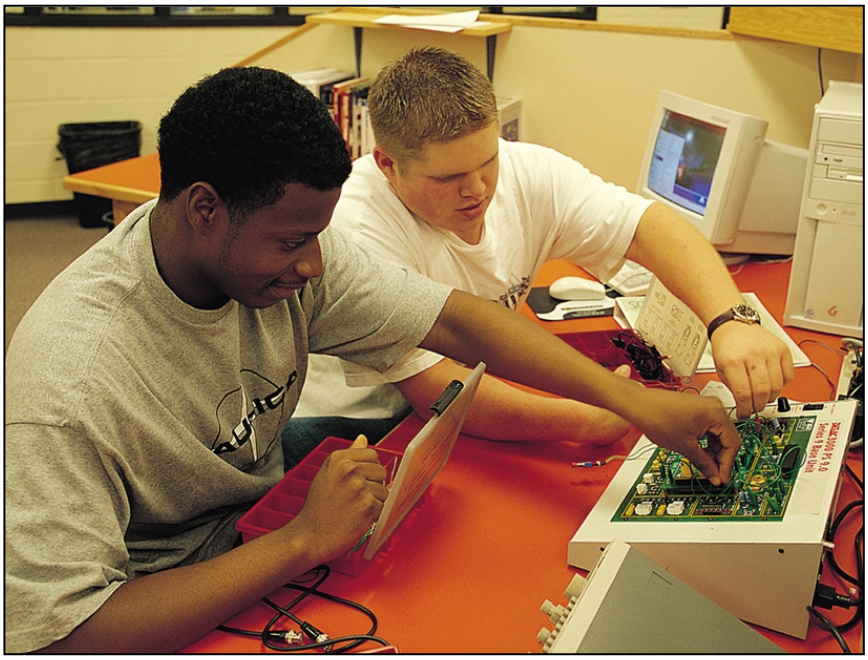
PRODUCT FACT SHEET

Basic Electricity (40-assignment)



This is an integrated instructional module designed specifically to operate within the LJ ScanTEK Modular Technology Program environment. It includes a 10-assignment exploratory curriculum and a further 30-assignment in-depth curriculum. The exploratory curriculum and the in-depth curriculum are each split into two parts. Each part includes a pre-test and post test. The module includes hardware, software and curriculum materials sufficient to provide a complete learning experience.

The curriculum incorporates continuous assessment through questions. When used in conjunction with a ClassAct networked management system, this provides instant feedback of student performance. The assessments begin with a comprehensive pre-test. This quiz includes questions for each subsequent assignment, together with questions that will specifically test math and reading ability.

Every assignment starts with a series of questions designed to track inventory. These ensure that any missing items are located before they are needed.

Each assignment is divided into a series of tasks. Hands-on tasks form the core of the student work. Where appropriate, these are accompanied by research tasks based upon on-screen applications. Assessment questions are incorporated into each task.

Typical 10-assignment topic areas include:

- Electricity production
- Electrical health and safety
- Circuit construction
- Current measurement in series and parallel DC circuits
- Voltage measurement in series and parallel DC circuits
- Electrical appliance disassembly
- Troubleshooting circuit problems

Typical 10-assignment activities include:

- Explore methods of industrial electricity production.
- Construct circuits on the computer using a simulation application.
- Construct an electricity generator.
- Construct series DC circuits using a Basic Electricity trainer.
- Use a multimeter to measure current in a series DC circuit.
- Use a multimeter to measure voltage in a series DC circuit.
- Construct parallel DC circuits using a Basic Electricity trainer.
- Use a multimeter to measure current in a parallel DC circuit.
- Use a multimeter to measure voltage in a parallel DC circuit.
- Demonstrate how increasing voltage increases the operating speed of a motor.
- Compare the differences between series circuits and parallel circuits.
- Fault-find a tropical fish aquarium electrical circuit.

Typical 30-assignment topic areas include:

- Static electricity
- Electrical current, voltage and resistance
- Cells in series and parallel
- Switches in series and parallel
- Resistors in series and parallel
- Components that sense their environment
- Electrical conductors and insulators
- Alternating current
- Protective devices
- Magnetism and electromagnetic fields
- Use of electromagnets
- Electric motors
- Electrical power production
- Using electrical energy
- Problem solving

Typical 30-assignment activities include:

- Investigate the reaction between electrically charged objects using a computer application.
- Watch a video of a static electricity experiment.
- Explore uses of electrostatics.
- Listen to a radio report of an incident involving electrostatic charge.
- View electrical current movement round a circuit using simulation software.
- Construct a circuit using a capacitor.
- Measure voltage using a multimeter.
- Measure resistance using a multimeter.
- Measure current using a multimeter.
- Construct a circuit to confirm Ohm's law.
- Disassemble a virtual flashlight.
- Measure the voltage of cells connected in series.
- Compare lamp brightness when using one and two batteries.
- Compare currents and voltages produced by series and parallel connected batteries.
- Calculate the ampere hour rating of battery configurations.
- Construct circuits that use toggle, push to make, and push to break switches.
- Construct a circuit using parallel switches.
- Construct a car lighting circuit.
- Measure the resistance of resistors connected in series.
- Measure the resistance of resistors connected in parallel.
- Calculate the resistance of equal and unequal value resistors connected in parallel.
- Construct circuits that are switched by sensing light levels.
- Identify how a light sensor operates.
- Construct a circuit that maintains a specific heat level.
- Discover how electricity causes a heating effect.
- Identify household items that use heat created by electricity.

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Typical 30-assignment activities include (continued):

- Test conductivity of materials using an interactive application.
- Construct a circuit using household objects as connectors, to identify conductors and insulators.
- Determine why conductors and insulators allow or block electrical flow.
- Identify the meaning of terms used in relation to AC supplies.
- Construct a circuit using a fuse.
- Construct a circuit using a circuit breaker.
- Discover how GFCIs work.
- Discover how double insulation works.
- Use magnets to determine when magnetic poles attract or repel.
- Use a compass to determine the magnetic field round a bar magnet.
- Watch a video to see how magnetic fields round bar magnets interact.
- Watch a video to see how a magnetic field is generated around a current carrying wire.
- Watch a video to see how a magnetic field is generated around a current carrying coil.
- Construct a circuit that uses a relay as a switch.
- Create an electromagnet circuit to lift weights.
- Identify practical uses of electromagnets.
- Identify how an electric motor works.
- Construct a circuit to allow a motor to operate at variable speeds.
- Construct a generator using a hand-held motor.
- Identify how generators work.
- Identify where generators are used in electricity production facilities.
- Identify how transformers work.
- Identify where transformers are used in electricity production facilities.
- Take measurements to calculate electrical power.
- Calculate electrical power used by household appliances.
- Read digital and dial type electricity meters.
- Calculate household electricity bills.
- Plan and develop a circuit to meet a design brief.
- Construct, test and evaluate a circuit to meet a design brief.

Each assignment is designed around a list of performance objectives. These lists include academic, technical and occupational objectives. The assignments are written in such a way as to enable a student to attain the performance objectives, with the assessment questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct management system to generate a comprehensive portfolio of student competency reports. Default reports supplied with this module include:

- Entry report
- Technical/Occupational Exit report
- Basic Skills report based upon the federal SCAN's report.

The items supplied with this instructional module include:

- 10-assignment On-Screen Student Assignment Guide CD
- 10-assignment Student Assignment Guide
- 10-assignment Student Workbook
- 10-assignment Instructor's Guide
- 30-assignment Student Assignment Guide
- 30-assignment Student Workbook
- 30-assignment Instructor's Guide
- Computer Aided Instruction Software
- Basic Electricity Trainer
- Basic Electricity Accessory Kit
- Digital Multimeter
- Virtual Labs: Electricity Software
- Electrical Circuit Simulator Reference Guide
- Magnetism Accessory Kit

Additional items required:

- Computer

Module Facts

For Technology Program, order as:
ST140/40 Basic Electricity

	No.	Average time
Assignments	40	45 minutes
Extension Activities	4	45 minutes
	Total	33 hours

LJ Technical Systems
Web site: www.ljgroup.com

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