This set of competency-based learning modules consists of four career exploration modules and three science modules for use with adults with limited English proficiency. The four career exploration modules contain activities designed to introduce students to career opportunities and basic job skills and safety procedures in the following fields: woodworking, machine tool operation, electronics, and printing and publishing. Each career exploration module contains some or all of the following: course description; list of course competencies; course outline; and lesson plan detailing lecture topics, objectives/tasks, and laboratory/learning activities. The three science modules, which are intended for use with intermediate English-as-a-Second-Language students, deal with the following topics: physical science, earth science and geography, and life science. Each science module includes some or all of the following: course description; list of required books/supplies; list of competencies; list of resources; and tables outlining the performance objectives and tasks covered in each unit along with related activities, resources/instructional aids, and evaluation devices. (MN)
SOUTHEAST ASIAN CAREER EXPLORATION PROGRAM

MODULES: WOODWORKING
MACHINE TOOL
ELECTRONICS
PRINTING & PUBLISHING
ESL PHYSICAL SCIENCE
ESL EARTH SCIENCE AND GEOGRAPHY
ESL LIFE SCIENCE

Prepared by Mel Podolske

June, 1993
The mission of this course in woodworking is to provide the students with an opportunity to further explore various areas of woodworking. Within these areas, the students will have opportunities to develop and apply basic skills in both hand and machine operations, learn about careers in the woodworking field, and construct projects dealing with various types of wood materials. Students will learn the safe and correct use of basic hand tools, the jointer, surface planer, table saw, radial arm saw, band saw, drill press, router, and various sanding machines. They will also develop skills in organization and in following set procedure. They will learn the correct sequence of using these machines as they proceed through activities to square up boards to be used for a completed project. An appreciation of wood and quality workmanship will also be nurtured.
END OF THE COURSE LEARNER EXPECTATIONS

1. Develop safe general work habits.

2. Be able to measure to the closest 1/16 inch, measure angles, and compute board foot measurement.

3. Identify the parts and operation of the basic woodworking hand tools.
   A. Hand saws
   B. Planes
   C. Boring and drilling tools

4. Identify the parts of the basic woodworking machines covered in this course.
   A. Jointer
   B. Surface planer
   C. Table saw
   D. Radial arm saw
   E. Band saw
   F. Drill press
   G. Router
   H. Sanding machines

5. List safety considerations pertaining to these machines.

6. Apply correct woodworking techniques to complete various woodworking projects.

7. Develop an understanding of careers and appreciation for the craftsman who creates attractive, durable furniture.

8. Apply problem solving skills to successfully complete a woodworking project.
COURSE OUTLINE

1. Project planning
   a. Objectives
      1. Be able to plan and complete a project in an organized manner
      2. Be able to read a working drawing

2. Layout tools
   a. Objectives
      1. Students will be able to use layout tools
      2. Students will be able to use different layout tools with some kind of proficiency

3. Hand saws
   a. Objectives
      1. Students will be able to identify all types of hand saws
      2. Develop in each student proficiency and skills in the use of hand saws

4. Hand planes
   a. Objectives
      1. Students will be able to adjust and set a plane properly
      2. Students will be able to sharpen a plane iron properly
      3. Students will know the proper uses for the different types of planes

   Skills
   1. Be able to:
      a. Read a drawing
      b. Make a plan of procedure for the project
      c. Figure board feet
      d. Figure square feet
      e. Figure linear feet
      f. Complete a bill of material

   Skills
   1. Be able to:
      a. Measure accurately with a rule
      b. Make lines with pencil, awl, and knife
      c. Square a line with a try square and framing square
      d. Gauge a line with a marking gauge
      e. Use trammel points, divider on compass
      f. Use a tee bevel properly

   Skills
   1. Be able to:
      a. Rip saw to a line
      b. Cross cut to a line
      c. Saw with a back saw
      c. Saw with a coping saw

   Skills
   1. Be able to:
      a. Assemble and disassemble a plane
      b. Grind a plane iron
      c. Whet a plane iron
      d. Adjust a double plane iron
      e. Plane a true edge
      f. Plane end grain
      g. Plane a chamfer and bevel
5. Boring and drilling tools
   1. Bit
   2. Braces
   3. Hand drill
   4. Twist drill
   5. Electric hand drill
   6. Battery powered hand drills

6. Fastening with screws and screwdrivers
   **Objectives**
   1. Be able to drive screws with a screwdriver
   2. Be able to tell the size and types of screws
   3. Be able to purchase screws properly
   4. Use a power screwdriver in the assembly of a wood project

   **Skills**
   - Be able to:
     - Select proper bit for the job
     - Assemble a bit in brace
     - Assemble twist drill in hand drill
     - Locate hole
     - Bore through hole
     - Bore a step hole
     - Counter-sink a hole

7. Clamps
   **Objectives**
   1. Be able to identify common types of clamps used in woodworking
   2. Be able to use each type of clamp properly

   **Skills**
   - Clamp with bar clamps, band screw clamps, and C-clamps

8. Glue and gluing
   **Objectives**
   1. Acquaint students with the various types of adhesives used in the woodworking industry
      a. advantages and disadvantages of various adhesives
      b. Identify terms, set time, shelf life and creep involved with adhesives
      c. Use adhesives in the construction of a woodworking project

   **Skills**
   - Acquaint students with various adhesives used in woodworking
   - Demonstrate "creep" in using adhesives
   - Identify set time and shelf life in association with adhesives
   - Clamp and glue various wood joints using a proper sequence
9. Wood finishing

1. Stains
2. Shellac
3. Varnishes
4. Enamel paints
5. Latex paints
6. Thinners and solvents
7. Application of finishes
   a. brush
   b. roller
   c. wiping
8. Preparation for finishing

Skills
1. Students will know difference of various types of wood stain
2. Students will know of common sealers for wood finishing
3. Students will be acquainted with types of paint
   a. Oil base
   b. Latex
4. Students will understand various types of finishes and their solvents
5. Students will be able to prepare and apply various finishes using two different types of application
MACHINE TOOLS

I. Jointer
   A. Purpose
   B. Size
   C. Safety considerations
   D. Parts
   E. Using the jointer

II. Surface Planer
   A. Purpose
   B. Size
   C. Parts
   D. Safety considerations

III. Circular Saw
   A. Purpose
   B. Sizes
   C. Types of blades
   D. Parts
   E. Safety considerations
   F. Using the circular saw

IV. Radial Arm Saw
   A. Size
   B. Parts
   C. Types of blades
   D. Safety considerations
   E. Using the radial arm saw
   F. Using a portable circular saw

V. Band Saw
   A. Purpose
   B. Size
   C. Parts
   D. Safety considerations
   E. Using the band saw
   F. Using a portable electric saber saw

VI. Drill Press
   A. Purpose
   B. Parts
   C. Safety considerations
   D. Size
   E. Using the drill press - machine bits, twist drills, brad point drills
   F. Depth stop

VII. Router
   A. Purpose
   B. Parts
   C. Safety considerations
   D. Using the router
VIII. Sanding Machines
   A. Purpose
   B. Parts
   C. Safety considerations
   D. Various types of sanding machines

IX. Careers in woodworking
GOALS AND OBJECTIVES
WOODWORKING

Goal 1 - To familiarize the students with the jointer.

The student will:

a. List the purposes of the jointer.
b. Name the parts of the jointer.
c. Explain how the size of the jointer is determined and how this affects its use.
d. List various safety considerations to be followed when using the jointer.
e. Explain the things to check before using the jointer.
f. Explain how to face joint and edge joint.
g. Use the jointer in the making of a woodworking project.

Goal 2 - To familiarize the students with the surface planer.

The student will:

a. List the purposes of the surface planer.
b. Name the parts of the surface planer.
c. Explain how the size of the surface planer is determined and how this affects its use.
d. List various safety considerations to be followed when using the surface planer.
e. Explain the things which should be checked before using the surface planer.
f. Explain how to use the surface planer to surface a board to thickness.
g. Use the surface planer in the making of a woodworking project.

Goal 3 - To familiarize the students with the circular (table) saw.

The student will:

a. List the operations that the circular saw can be used for.
b. Name the parts of the circular saw.
c. Explain how the size of the circular saw is determined.
d. List various safety considerations to be followed when using the circular saw.
e. Explain the things to check before using the circular saw.
f. Explain how to crosscut, rip, and dado on the circular saw.
g. Use the circular saw in the making of a woodworking project.
Goal 4 - To familiarize the students with the radial arm saw.

The student will:

a. List the operations for which the radial arm saw can be used.
b. Name the parts of the radial arm saw.
c. Explain how the size of the radial arm saw is determined.
d. List various safety considerations to be followed when using the radial arm saw.
e. Explain how to rough crosscut on the radial arm saw.
f. Use the radial arm saw in the making of a woodworking project.

Goal 5 - To familiarize the students with the band saw.

The student will:

a. Name the type of cutting the band saw is used for.
b. Name the parts of the band saw.
c. List various safety considerations to be followed when using the band saw.
d. Explain the things to check before using the band saw.
e. Explain how to freehand cut on the band saw.
f. Use the band saw in the making of a woodworking project.

Goal 6 - To familiarize the student with the drill press.

The student will:

a. List the purpose of the drill press.
b. Name the parts of a drill press.
c. Explain how the size of the drill press is determined and how this affects its use.
d. List various safety considerations to be followed when using the drill press.
e. Explain the things to check before using a drill press.
f. Explain how to insert drill bit, set depth gauge, and hold work for drilling on a drill press.
g. Use drill press in making a woodworking project.

Goal 7 - To familiarize the students with the router.

The student will:

a. Name various types of cuts that the router can do.
b. Name the parts of the router.
c. List various safety considerations to be followed when using the router.
d. Explain the things to check before using the router.
e. Explain how to use the router to rabbet and shape an edge.
f. Use the router in the making of a woodworking project.
Goal 8 - To familiarize the student with sanding machines.

The student will:

a. List the purpose of sanding machines.
b. Identify various parts of sanding machines.
c. Explain advantages and disadvantages of various types of sanding machines.
d. List various safety considerations to be followed when using sanding machines.
e. Explain how to change various shapes of abrasives for various sanding machines.
f. Use a sanding machine in the making of a woodworking project.

Goal 9 - To familiarize the students with careers in woodworking.

The student will:

a. Name various careers in woodworking.
b. List various types of training needed to prepare for these careers.
c. Identify various skills needed to be successful in these careers.
<table>
<thead>
<tr>
<th>DAY 1</th>
<th>DAY 2</th>
<th>DAY 3</th>
<th>DAY 4</th>
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<tbody>
<tr>
<td><strong>Course introduction</strong>&lt;br&gt;Introduction of 1st project&lt;br&gt;Reading a drawing&lt;br&gt;Set up job plan sheet&lt;br&gt;Compute board feet&lt;br&gt;Measuring</td>
<td><strong>Hand saws demo</strong>&lt;br&gt;Rip, cross cut&lt;br&gt;coping&lt;br&gt;layout&lt;br&gt;Job plan sheet&lt;br&gt;Computing board feet</td>
<td><strong>Questions and answers on sawing (hand)</strong>&lt;br&gt;Continue with layout&lt;br&gt;Job plan sheet&lt;br&gt;Introduce planer and planing&lt;br&gt;Grinding plane irons</td>
<td><strong>Planing questions and answers</strong>&lt;br&gt;Layout of stretcher&lt;br&gt;Coping saw work&lt;br&gt;Job plan sheet&lt;br&gt;Student work on preparing stock for stretcher</td>
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<td><strong>Check with students in completion of hand operations</strong>&lt;br&gt;Introduction of radial arm saw&lt;br&gt;Gluing operations face to face&lt;br&gt;Students begin to cut stock for parts of bench</td>
<td><strong>Introduction of jointer</strong>&lt;br&gt;operations safety&lt;br&gt;Students working on stretcher</td>
<td><strong>Introduction of surfaces/planed operation</strong>&lt;br&gt;safety&lt;br&gt;Students cutting stock&lt;br&gt;Work on stretcher</td>
<td><strong>Introduction of circular saw</strong>&lt;br&gt;safety operations&lt;br&gt;blades&lt;br&gt;Students complete stretcher&lt;br&gt;Cutting of parts for bench</td>
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<td><strong>Students preparing stock for gluing</strong>&lt;br&gt;Cutting of stock for parts of bench&lt;br&gt;Gluing operations</td>
<td><strong>Students preparing stock for gluing operations</strong>&lt;br&gt;Squaring of stock</td>
<td><strong>Students gluing</strong>&lt;br&gt;Use of patterns&lt;br&gt;Layout of parts already glued up&lt;br&gt;Cut dado's for project work</td>
<td><strong>Introduction of band saw</strong>&lt;br&gt;operations safety</td>
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<td>Demonstration band sawing work associated with project</td>
<td>Demonstration drill press work Students continue with project work</td>
<td>Demonstration drilling jig for doweling Go over material for fasteners nails/screws</td>
<td>Demonstrate sanding machine Preparation for finishing</td>
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<td>Students working on project parts</td>
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<tr>
<td>Introduction of second project</td>
<td>Demonstration of finishing Students prepare work for finishing Apply finish Work on second project</td>
<td>Continue with finishes not associated with project</td>
<td>Application of finishes Apply finish to 1st project</td>
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<td>Continue preparations for finishing</td>
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<td>Work on second project Completion of 1st project</td>
<td>Completion of finishing of 1st project Work on second project Identify project</td>
<td>Work on second project</td>
<td>Demonstration of hand saber saw electric hand saw</td>
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<td>Work on second project Completion of 1st project</td>
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<td>Work on second project</td>
<td>Demonstration router work</td>
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<td>Discussion of careers in the woodworking field</td>
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<td>Work on second project</td>
<td>Discussion of careers in the woodworking field</td>
<td>Finish of the second project</td>
<td>Finish of work Clean shop area Completion of the course</td>
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Types of wood
- Soft woods
- Hard woods
- Man-made

Materials used in woodworking
Wood joints
INSTRUCTOR

MEL PODOLSKE

Telephone # - 359-4026
SOUTHEAST ASIAN
CAREER EXPLORATION PROGRAM

Machine Tool

Instructor: Steve Watzlawick
Office: 675-3331 Ext. 222
Phone: 675-3331 Ext. 222
COURSE DESCRIPTION: The purpose of this course is to provide students with the opportunity to explore various aspects of the machining industry. The nine week course is designed to enable Southeast Asian students to develop and apply basic skills in benchwork, drill press, band saw, pedestal grinder and lathe operations. Proper procedures, safety and quality will be stressed throughout the course.

COURSE LENGTH: 9 weeks
HOURS PER WEEK: 12 hours, 4 sessions - 3 hours per session
TOTAL HOURS: 108 Hours

MATERIALS REQUIRED: Safety Glasses
Course Competencies

Career Exploration - Southeast Asian Students

1. Follow safety procedures.
2. Perform precision measurement operations. (English System)
3. Perform hand tool operations.
4. Set-up and operate a vertical band saw.
5. Set-up and operate a drill press.
6. Set-up and operate a pedestal grinder.
7. Calculate speeds and feeds for various operations.
8. Set-up and operate an engine lathe.
9. Set-up and operate a vertical milling machine.
UNIT #1 - SAFETY

Course Competency - Follow Safety Procedures

OBJECTIVES AND TASKS:

1.0 Wear eye protection when required
1.1 Identify various safety considerations
1.2 Identify possible safety hazards

ACTIVITIES:

The student will view video tape on general shop safety and discuss safety procedures.

UNIT #2 - PRECISION MEASUREMENT

Course Competency - Perform Precision Measurement Operations

OBJECTIVES AND TASKS:

2.0 Perform measurements with steel rule
2.1 Perform measurements with micrometers
2.2 Perform measurements with calipers
2.3 Perform measurements with height gage

ACTIVITIES:

The student will perform measurements on various objects using different measurement tools. Perform layout on Mating Block Project.

UNIT #3 - HAND TOOLS

Course Competency - Perform hand tool operations

OBJECTIVES AND TASKS:

3.0 Identify and use layout dye
3.1 Identify and use center punch
3.2 Identify and use ball peen hammer
3.3 Identify and use scriber
3.4 Identify and use hand hacksaw
3.5 Identify and use file and file card

ACTIVITIES:

The student will perform layout of Mating Block Project. Cut out and file to size per blueprint.
UNIT #4 - BAND SAW

Course Competency: Set-up and operate a vertical band saw.

OBJECTIVES:

4.0 Follow proper safety procedures  
4.1 Select proper saw blade  
4.2 Select proper saw speed  
4.3 Install saw blade properly

ACTIVITIES:

The student will use the vertical band saw to cut on the Mating Block Project.

UNIT #5 - DRILL PRESS

Course Competency: Set-up and operate a drill press.

OBJECTIVES AND TASKS:

5.0 Follow proper safety procedures  
5.1 Select proper drill speed  
5.2 Center drill a hole  
5.3 Drill a hole  
5.4 Select proper tap drill  
5.5 Hand tap a hole

ACTIVITIES:

The student will center drill, drill and tap holes in a project.

UNIT #6 - PEDESTAL GRINDER

Course Competency: Set-up and operate a pedestal grinder.

OBJECTIVES AND TASKS:

6.0 Follow proper safety procedures  
6.1 Adjust tool rest and guards  
6.2 Dress grinding wheel  
6.3 Grind general purpose lathe tool

ACTIVITIES:

The student will use a pedestal grinder to grind a general purpose lathe tool bit.
UNIT #7 - SPEEDS AND FEEDS

Course competency: Calculate speeds and feeds for various operations.

OBJECTIVES AND TASKS:

7.0 Follow proper safety procedures
7.1 Calculate RPM for various operations
7.2 Select and use correct speeds and feeds

ACTIVITIES:

The student will calculate, select and use the proper RPM for various machining situations.

UNIT #8 - ENGINE LATHE

Course Competency: Set-up and operate an engine lathe.

OBJECTIVES AND TASKS:

8.0 Follow safety procedures
8.1 Face a part
8.2 Center drill a part
8.3 Turn to a specified diameter
8.4 Machine a shoulder
8.5 Chamfer a part
8.6 Knurl a part
8.7 Turn with a carbide insert

ACTIVITIES:

The student will perform various operations on an engine lathe using high speed tools.
UNIT #9 - VERTICAL MILL

Course Competency: Set-up and operate a vertical milling machine.

OBJECTIVES AND TASKS:

9.0 Follow safety procedures
9.1 Vertical mill components
9.2 End mill a part
9.3 Mill a part square
9.4 Mill a slot in a part

ACTIVITIES:

The student will perform various operations on a vertical milling machine using an end mill.
WEEK #1

Lecture Topics:
- Introduction to machine tool
- General shop safety
- Precision measurement
- Layout procedures

Lab:
- Demonstration of layout
- Layout of Mating Block Project
- Measurement of various objects

WEEK #2

Lecture Topics:
- Layout procedures
- Drill press operation
- Hand tool operations

Lab:
- Continued production of Mating Block Project. Use of drill press, hack saw, file and other tools in order to complete project.

WEEK #3

Lecture Topics:
- Pedestal grinder operation
- Lathe tool angles
- Grinding of lathe tool

Lab:
- Demonstration on grinder
- Practice grinding of "soft" tool bit
- Grind general purpose tool bit

WEEK #4

Lecture topics:
- Feeds and speeds
- Engine lathe components

Lab:
- Selection of speeds and feeds
- Familiarization with engine lathe.
WEEK #5

Lecture Topics:
-Engine lathe operations
  -Facing
  -Turning
  -Drilling

Lab:
-Work on Lathe Project #1. Turning and facing to proper dimensions on blueprint.

WEEK #6

Lecture Topics:
-Engine lathe operations
  -Knurling
  -Turning to a shoulder

Lab:
-Work on Lathe Project #2. Knurling and turning to a shoulder as per drawing.

WEEK #7

Lecture Topics:
-Carbide tools
  -Chamfering on a lathe

Lab:
-Demonstration on carbide tools on engine lathe.
  -Chamfering on lathe.
  -Opportunity to trial turn with carbide inserts

WEEK #8

Lecture Topics:
-Vertical mill components
-Vertical mill operations

Lab:
-Familiarization with vertical mill.
-Start on Milling Machine Project.

WEEK #9

Lecture Topics:
-Milling cutters
-Milling machine operations

Lab:
-Continued production of Milling Machine Project.
-Use of end mill.
Course: Electronics Career Exploration

Instructor: Gordon Haggerty
Office: Rm. 560
Ph. 675-3331 ext. 262

Course Description:

This course will provide students with a broad view of the electrical and electronic career fields. The course covers general concepts of electricity, basic computer concepts, residential wiring concepts, soldering, and motors. The area of general concepts of electricity covers electrical terms, equipment usage, series circuits, parallel circuits, and series-parallel circuits. Basic computer concepts covers the components of a computer and basic DOS commands. Residential wiring concepts involves wiring basic household circuits to familiarize a student with the electrician career field. The soldering section involves using proper soldering techniques to solder terminals and printed circuit boards. The last portion of course will involve the wiring of motors and motor control circuits.

Materials Requirement:

Lab Material:

Laboratory Manual: Experiencing Electricity and Electronics by Hazen
Saunders Publishing
ISBN 0-03-096567-5

Wiring Manual: Step by Step Guide on Home Wiring
Available at Menards
Approx. $2.50

Motor Control Guide: The Square D Motor Guide
(Not Purchased)
SCHEDULE OF COURSE ACTIVITIES

COURSE LENGTH: 9 WEEKS
HOURS PER WEEK: 12 HOURS (4 SESSIONS 3 HOURS PER SESSION)
TOTAL COURSE: 108 HOURS

WEEK #1

Lectures Topics:
- Careers in electronics (video)
- Basic atomic theory
- Definitions of voltage, current and resistance
- Safety Procedures
- Common electronic components

Lab:
- Introduction to the analog and digital meter
- Introduction to DC and AC power sources
  - Ohmmeter - check fuses, wire, switches etc.
  - Voltmeter - DC
    - check battery voltages
    - check output of dc power supply
  - Voltmeter - AC
    - check outlet voltage
  - Ammeter - measure current in an AC and DC circuit consisting of a source and a bulb.
- Identify various electronic components mounted on the display boards and loose components.

WEEK #2

Lecture Topics:
- Resistors - variable and fixed
- Introduction to Ohm's law
- Breadboards

Lab:
- The Resistor Color Code and The Ohmmeter (Exp.#1)
- Variable Resistors and The Ohmmeter (Exp.#2)
- Multiturn Potentiometer (Handout)
WEEK #3

Lecture Topics:
- Ohm's Law
- Power and the power formulas
- Series Circuits

Lab:
- Ohm's Law and Power (Exp. 3)
- Series-Aiding and Opposing DC Sources (Exp. 4)
- The Series Circuit and Kirchhoff's Voltage Law (Exp. 5)
- An AC series circuit handout

WEEK #4

Lecture Topics:
- Series circuits (voltage divider)
- Parallel circuits

Lab:
- Variable Voltage and Current (Exp. 6)
- The Parallel Circuit and Kirchhoff's Current Law (Exp. 7)
- Dividing Current (Exp. 8)
- An AC parallel circuit handout

WEEK #5

Lecture Topics:
- Series-Parallel Circuits
- Troubleshooting Series Parallel Circuits

Lab:
- Series-Parallel Circuits Handout
- Series-Parallel Circuits (Exp. 9)
- Parallel-Series Circuits (Exp. 10)
- The Wheatstone Bridge (Exp. 11)
WEEK #6

Lecture Topics:
- Digital Circuitry
- What makes up a computer for a block diagram point of view. (CPU, RAM, ROM, I/O)
- The function of peripheral computer equipment
- DOS commands

Lab:
- A digital handout lab activity
- A handout activity involving the identification of components of a computer system.
- A handout lab activity involving the DOS commands, and how programs are run.

WEEK #7

Lecture Topics:
- The power distribution system
- How a residential power distribution panel is wired
- Electrical Code
- Household circuits

Lab:
- Wire circuits shown in the Step By Step Guide On Home Wiring book.

WEEK #8

Lecture Topics:
- How motors operate
- Various types of motors in use today
- Protection of motors
- Basic Motor control circuits

Lab:
- DC Motors and Generators (Exp. 18)
- Transformers (Exp. 26)
- Connecting power to a split-phase capacitor start single phase motor
WEEK #9

Lecture Topics:

- Motor control circuits
- Review of material covered in course

Lab:

- Wire basic motor control circuits out of the square D motor control handbook
COURSE COMPETENCIES

Career Exploration - Southeast Asian Students

1. Follow safety procedures.
2. Identify various electronic components.
3. Define, calculate, and measure various resistances and resistors.
4. Define and measure DC and AC voltages and current in a circuit consisting of one source and one load.
5. Construct and analyze series circuits with a DC and AC source.
6. Construct and analyze parallel circuits with a DC and AC source.
7. Construct and analyze series-parallel circuits with a DC and AC source.
8. Identify physical computer components.
9. Use simple DOS commands for elementary computer operation.
11. Discuss in general terms the electrical power distribution system from the generation of power to an end user of electrical energy.
12. Wire simple household circuits following wiring diagrams found in a guide book on home wiring.
13. Discuss the basic types of motors and protective devices used with motors.
14. Wire basic motor control circuits.
Unit No. 1  

Unit Title - Safety

Course Competency - Follow safety procedures

**Performance Objective(s) and Tasks**

1.0 Wear eye protection when required.

1.1 Explain the cause of electrical shock and what determines the severity of an electrical shock.

1.2 Explain the procedure to follow when confronted with an electrical shock victim.

**Activities**

1. View video tape 815-01 "Introduction to safety in the Lab."
Unit No. 2  Unit Title - Electronic Components

Course Competency - Identify various electronic components.

Performance Objective(s) and Tasks

2.0  Identify of various types of switches.
2.1  Identify various types of fuses, and circuit breakers.
2.1  Identify various types of fixed and variable resistors.
2.2  Identify various types of capacitors.
2.3  Identify various types of inductors.
2.4  Identify semiconductor devices.

Activities

1. The student will be given various electronic components to separate into the broad categories of a switch, fuse, circuit breaker, fixed resistor, variable resistor, capacitor, inductor, or semiconductor.
Unit No. 3  Unit Title - Resistance

Course Competency - Define, calculate, and measure various resistances and resistors.

Performance Objective(s) and Tasks

3.0 Define and measure continuity as it relates to checking wires, fuses, and switches using an ohmmeter.

3.1 Measure the resistance of spools of wire.

3.2 Determine the resistance value and tolerance of color coded resistors.

3.3 Measure the resistance of various fixed and variable resistors using an ohmmeter.

Activities

1. View a video tape on resistors and resistance.

2. Students will perform a lab exercise on measuring various types of fixed and variable resistors.
Unit No. 4  
Unit Title - Voltages and Currents

Course Competency - Define and measure DC and AC voltage in a circuit consisting of one source and one load.

Performance Objective(s) and Tasks

4.0 Measure DC voltages produced by connecting dry cell batteries in various combinations.
4.1 Measure DC voltages produced by a DC power supply.
4.2 Measure AC voltage produced by a variable AC source.
4.3 Construct and measure current in a simple circuit consisting of a DC source and light bulb.
4.4 Construct and measure current in a simple circuit consisting of an AC source and light bulb.

Activities

1. View video tapes "An Introduction to Electricity" and "Scientific Notation and Metric Prefixes"
2. Perform lab activities involving the operation of DC and AC sources, the construction of basic circuits, and the measurement of current and voltages.
Unit No. 5  Unit Title - Series Circuits

Course Competency - Construct and analyze series circuits with DC and AC sources.

Performance Objectives(s) and Tasks

5.1 Construct series circuits with a DC source.

5.2 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series circuit powered by a DC source.

5.3 Measure current and voltage drops in series circuits powered by a DC source.

5.4 Compare calculated and measured values in series circuits powered by a DC source.

5.5 Construct series circuits with an AC source.

5.6 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series circuits powered by an AC source.

5.7 Measure current and voltage drops in series circuits powered by an AC source.

5.8 Compare calculated and measured values in series circuits powered by an AC source.

5.9 Observe AC voltages using an oscilloscope.

Activities

1. View video tapes "Ohms Law and Power" and "Series Circuits"

2. Perform labs involving the connection and analyze of series circuits.
Unit No. 6  Unit Title - Parallel Circuits

Course Competency - Construct and analyze parallel circuits with DC and AC sources.

Performance Objectives(s) and Tasks

6.1 Construct parallel circuits with a DC source.

6.2 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in parallel circuits powered by a DC source.

6.3 Measure current and voltage drops in parallel circuits powered by a DC source.

6.4 Compare calculated and measured values in parallel circuits powered by a DC source.

6.5 Construct parallel circuits with an AC source.

6.6 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in parallel circuits powered by an AC source.

6.7 Measure current and voltage drops in parallel circuits powered by an AC source.

6.8 Compare calculated and measured values in parallel circuits powered by an AC source.

Activities

1. View video tape "Parallel circuits"

2. Perform labs involving the connection and analyze of parallel circuits.
Unit No. 7  
Unit Title - Series-Parallel Circuits

Course Competency - Construct and analyze series-parallel circuits with DC and AC sources.

Performance Objectives(s) and Tasks

7.1 Construct series-parallel circuits with a DC source.

7.2 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series-parallel circuits powered by a DC source.

7.3 Measure current and voltage drops in series-parallel circuits powered by a DC source.

7.4 Compare calculated and measured values in series-parallel circuits powered by a DC source.

7.5 Construct series-parallel circuits with an AC source.

7.6 Apply Ohm's Law and power formulas to calculate current, voltage drops, and power in series-parallel circuits powered by an AC source.

7.7 Measure current and voltage drops in series-parallel circuits powered by an AC source.

7.8 Compare calculated and measured values in series-parallel circuits powered by an AC source.

Activities

1. View video tape "Series-Parallel circuits"

2. Perform labs involving the connection and analyze of series-parallel circuits.
Unit No. 8  Unit Title - Computer Components

Course Competency - Identify physical computer components.

Performance Objectives(s) and Tasks

8.1 Identify the main computer and explain its usage.
8.2 Identify the location and types of disk drives in the system and explain its usage.
8.3 Identify the keyboard and explain its usage.
8.4 Identify the system monitor and explain its usage.
8.5 Identify the serial and parallel ports of a computer.
8.6 Identify the peripheral equipment connected to the system and explain the equipment usage.

Activities

1. Each student will go through a step by step procedure involving using a computer system and word processing software to use the keyboard, monitor, disk drives, and printer.
Unit No. 9  Unit Title - A Disk Operating System

Course Competency - Use simple DOS commands for elementary computer operation.

Performance Objectives(s) and Tasks

9.0 Explain what the term DOS means.

9.1 Explain the organizational structure for storing programs and data within a computer system.

9.2 Demonstrate the following DOS commands:

- Formatting a disk
- Moving from one directory to another
- Making a directory
- Storing data under a specific directory
- Deleting data in a specific directory
- Removing a directory

Activities

1. A step by step procedure will be followed so that each student performs the tasks listed above.
Unit No. 10    Unit Title - Soldering

Course Competency - Performing soldering and desoldering of terminal connections and components.

Performance Objectives(s) and Tasks

10.0 Prepare a soldering gun and iron for soldering.
10.1 Prepare surfaces and components for soldering.
10.2 Solder wire to terminal post using a soldering gun.
10.3 Mount and solder electronic components on a printed circuit board using a pencil soldering iron.
10.4 Desolder wires on terminal posts and electronic components mounted on a circuit board.

Activities

1. View video tape on soldering.
2. Perform the tasks listed above.
Unit No. 11  Unit Title - **The electrical power distribution system.**

Course Competency - Discuss in general terms the electrical power distribution system from the generation of power to an end user of electrical power.

**Performance Objectives(s) and Tasks**

11.0 Discuss the theory involved with the generation of electrical power.

11.1 Generate electricity by coupling two small DC motors using one as a motor and one as a generator.

11.2 Demonstrate the purpose of transformers.

11.3 Discuss how power is distributed from the generating plant to an individual home.

**Activities**

1. Perform a lab activity involving a small motor and generator.

2. Perform a lab activity involving the connection of a transformer to an AC source and measuring the input and output voltage.

3. Tour Weston power plant.
Unit Title - Household circuits

Course Competency - Wire simple household circuits following wiring diagrams found in a guide book on home wiring.

Performance Objectives(s) and Tasks

12.0 Discuss the construction of a residential circuit breaker box.
12.1 Discuss the types of wire and the color coding of wire used in household wiring.
12.2 Discuss the purpose of the electrical code and that actual household wiring should be performed by a qualified electrician.
12.3 Discuss the symbols associated with residential wiring.
12.4 Discuss the tools used in residential wiring.
12.5 Wire the following circuits following illustrations of the circuits in a step by step guide book on home wiring.

- outlets
- single-pole switch controlling lamps
- switched outlets
- three-way switch circuits controlling lamps

Activities

1. Discuss the power distribution display panel that is set up in the residential design lecture room.

Unit No. 13  Unit Title - Electric motors

Course Competency - Discuss the basic types of motors and protective devices used with motors.

Performance Objectives(s) and Tasks

13.0 Discuss basic differences in construction between various A-C motors.

13.1 Wire a 120 volt a-c split phase-capacitor start motor.

13.2 Discuss common voltage and current ratings available for fuses and circuit breakers.

13.3 Discuss how motors are protected.

Activities

1. View a film strip cassette presentations on motors. (Video Tapes 725 A-C)
   - Split Phase induction motors
   - Capacitor Induction Motors
   - Repulsion Type Motors
   - Universal Motors
   - Squirrel Cage Motors

2. Read sections of BUSS BULLETIN SPD81 Electrical Protection Handbook
   Identify various types of circuit protection devices.

3. Observe overload protection of motors.
Unit No. 14  Unit Title - Motor control

Course Competency - Wire basic motor control circuits.

Performance Objectives(s) and Tasks

14.0 Describe the components of a motor starter.
14.1 Describe the operation of a start/stop switch.
14.2 Discuss ladder diagrams.
14.3 Wire basic motor control circuits.

Activities

1. Wire basic motor control circuit out of Wiring Diagrams, Publisher Square D Company,
COURSE SYLLABUS
Preparatory Program for Southeast Asians
Printing & Publishing

Instructors: Desktop Publishing - Mr. Martens
Camera & Image Assembly - Mr. Swadner
Presswork - Mr. Grasse

The instructors can be reached by leaving a message
for them during the hours of 8:00 A.M. to 4:00 P.M.
A conference can be scheduled during the instructor’s
office hour by making an appointment with the instructor.

Student Expectations:
The student will perform hands-on work during all phases of instruction
by doing assigned projects. The student will be expected to be present
at all class sessions and to perform all tasks assigned by the
instructor. Some of the tasks will include cleanup of work area and
machines used by the student. The student will not be excused for the
day until his/her work area is cleaned to the instructor’s
satisfaction.

Supplies Required for Course:
1 pr. rubber gloves
1 pr. chemical safety goggles
1 magnifying glass
1 line gauge
1 eraser (pink pearle)
1 makeready knife
1 set of register pins
1 pr. scissors
2 3 1/2" computer discs

Texts: (1) Title: Graphic Arts Photography: Black and White
Publisher: Graphic Arts Technical Foundation
Author: John E. Cogoli
Copyright: 1990

(2) Title: Stripping: The Assembly of Film Images
Publisher: Graphic Arts Technical Foundation
Author: Peck
Copyright: 1990
Course Name: Preparatory Program for Southeast Asians - Printing & Publishing

Course Description: An introduction to Printing & Publishing. Topics include Desktop Publishing, Pasteup, Camerawork/Darkroom Techniques, Platemaking, Presswork, and Finishing. Hands-on experience is used in all areas of instruction.

Texts: (1) Title: Graphic Arts Photography: Black and White
Publisher: Graphic Arts Technical Foundation
Author: John E. Cogoli
Copyright: 1990

(2) Title: Stripping: The Assembly of Film Images
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Supplies Required for Course:
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- 1 pr. scissors
- 2 3 1/2" computer discs
COURSE COMPETENCIES
PREPARATORY PROGRAM FOR SOUTHEAST ASIANS
PRINTING AND PUBLISHING

Performance Objectives:
01.00 Identify the parts of a microcomputer system.
02.00 Demonstrate the basic use of the microcomputer.
03.00 Identify the elements of a keyline paste-up.
04.00 Prepare job and mark copy for typesetting and page layout.
05.00 Identify the types of graphic images used for typesetting and line art.
06.00 Demonstrate the use of page layout software for the creation of single color layouts.
07.00 Demonstrate safe practices in the dark room and film assembly area.
08.00 Calibrate for and make line exposures for black and white originals developing film using the tray processing method.
09.00 Calibrate for and make reverses by the contact printing method.
10.00 Calibrate for and make halftones from black and white continuous tone originals.
11.00 Calibrate for and make duplicate negatives, spread/chokes, and outline type on the contact printer and micro modifier.
12.00 Assemble one up flats for surprints, reverses and dropouts.
13.00 Assemble one up flats with line and screened images for the small format.
14.00 Make ready, adjust, and print copies on one color duplicators.
15.00 Demonstrate safe practices in the press room.
16.00 Demonstrate the proper handling and disposal of hazardous materials.

Activities and Resources:
Participate in Lecture/Demonstrations.
Complete assigned exercises.

Evaluation Devices:
Performance projects.
Nit Title: Microcomputer System Components

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 01.00 Identify the parts of a microcomputer system.

Performance Objectives:

1.01 Given a component diagram of a microcomputer system, identify each of the parts.

1.01.01 Input Components
   a. Keyboard
   b. Mouse
   c. Scanner

1.01.02 Output Components
   a. Video display
   b. Laser printer
   c. Film recorder

1.01.03 System Components
   a. CPU (Central processing unit)
   b. Main board
   c. Add-on cards
   d. Storage devices
      1. Floppy disk drive
      2. Hard disk drive
   e. Memory
      1. Read only memory (ROM)
      2. Random access memory (RAM)

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance project.
Unit Title: Basic Microcomputer Operation

Course: Preparatory Program for Southeast Asians – Printing & Publishing

Course Competency: 02.00 Demonstrate the basic use of the microcomputer.

Performance Objectives:

2.01 Given a microcomputer with a graphical user interface (GUI), a student shall be able to maneuver the mouse to control the operation of the computer.

2.02 Given a microcomputer with a graphical user interface (GUI), a student shall be able to organize the desktop.

2.03 Given a microcomputer with a graphical user interface (GUI), a student shall be able to create and replicate files and folders.

2.04 Given a microcomputer with a graphical user interface (GUI), a student shall be able to open and use a variety of computer software applications.

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance project.
Unit No. 3

Title: Paste-up Elements

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 03.00 Identify the elements of a keyline paste-up.

Performance Objectives:

3.01 Given typeset copy and illustrations, prepare a single-color manual paste-up including the following elements:

- 3.01.01 Ruled lines
- 3.01.02 Corner marks
- 3.01.03 Fold and cut marks
- 3.01.04 Typeset copy
- 3.01.05 Line illustrations

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance project.
Unit No. 4

Unit Title: Marking up copy

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 04.00 Prepare job and mark copy for typesetting and page layout.

Performance Objectives:

4.01 Given the basic information for a finished printing job, mark copy for typesetting to include the following:

4.01.01 Type Sizes
   a. Text
   b. Display
4.01.02 Type Families
4.01.03 Type Styles
   a. Normal
   b. Italic
   c. Bold
4.01.04 Leading
4.01.05 Rules
4.01.06 Element Position

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance projects.
Unit No. 5

Unit Title: Graphic and image modes.

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 05.00 Identify the types of graphic images used for typesetting and line art.

Performance Objectives:

5.01 Given examples of printed graphic images, distinguish between bit-mapped images and object oriented.

5.02 Given examples of bit-mapped graphic images, categorize them by the following file types based in their visual resolution.

   5.02.01 MacPaint (72 dpi)
   5.02.02 Tiff (300 dpi)

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance projects.
Unit Title: Computerized page layout

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 06.00 Demonstrate the use of page layout software for the creation of single color pages.

Performance Objectives:

6.01 Given copy for image preparation, prepare finished single color layouts using PageMaker software utilizing the following elements:

6.01.01 Text copy
6.01.02 Display copy
6.01.03 Graphic images

Activities and Resources:

Participate in Lecture/Demonstrations.

Evaluation Devices

Observation.

Performance projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 07.00 Demonstrate safe practices in the dark room and film assembly area.

Performance Objectives:

07.01 Given references on hazardous materials, the student will be able to take and pass a test on handling and disposing of hazardous materials, with 90% or better accuracy.

Activities and Resources:

- Participate in Lecture/Demonstrations.
- Read chapter 9 of text.

Evaluation Devices:

- Observation.
- Performance Projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 9.00 Calibrate for and make line exposures for black/white using tray developing methods.

Performance Objectives:

8.01 Given the facilities used for training the student shall be able to arrive at the correct line exposure for black and white originals, in two attempts or less.

8.02 Given the facilities used for training the student shall be able develop line exposed film using tray developing methods.

8.03 Given the equipment used for training a student shall be able to reduce and enlarge copy using the constant time exposure method.

8.04 Given the equipment used for training a student shall be able to reduce and enlarge copy using the constant aperture method.

8.05 Given the equipment used for training a student shall be able to arrive at the correct exposure for copy containing both fine and heavy lines.

8.06 Given the equipment used for training a student shall be able to arrive at the correct line exposure for copy with poor density range.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 9.00 Calibrate for and make reverses by the contact printing method.

Performance Objectives:

09.01 Given the equipment used for training, the student, using the contact printing method, will make a spread negative, in two attempts of less.

09.02 Given the equipment used for training, the student using the contact printing method, will make a choke negative, in two attempts of less.

09.03 Given the equipment used for training, the student using the contact printing method, will make a spread positive, in two attempts or less.

09.04 Given the equipment used for training, the student using the contact printing method, will make a choke positive, in two attempts or less.

09.05 Given the equipment used for training, the student using the contact printing method, will make an outline negative, in two attempts or less.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 6 of text.

Evaluation Devices:

Observation.

Performance Projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 10.00 Calibrate for and make halftones from black and white photographs.

Performance Objectives:

10.01 Using the Du Pont method for making halftones, the student will be able to create a halftone from a continuous tone black and white photograph, with a 5% highlight dot and a 95% shadow dot with no more than two tries.

10.02 Given the equipment used for training, the student will be able to reduce or enlarge a halftone with a 5% highlight dot and a 95% shadow dot using the constant aperture exposure method in two attempts or less.

Activities and Resources:

- Participate in Lecture/Demonstrations.
- Read chapter 10 of text.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 11.00 calibrate for and make duplicate negatives, spread/chokes, and outline type on the contact printer and micro modifier.

Performance Objectives:

11.01 Using the equipment trained on, position duplicate negatives, spread/chokes, and outline type on the flat as per instructions on the paste-up with 100% accuracy.

Activities and Resources:

Participate in Lecture/Demonstrations.

Read chapter 9 of text.

Evaluation Devices:

Observation.

Performance Projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 12.00 Assemble one up flats for surprints, reverses and dropouts.

Performance Objectives:

12.01 Using the equipment trained on, position surprints, reverses and dropouts images as per instructions on the paste-up with 100% accuracy.

Activities and Resources:
- Participate in Lecture/Demonstrations.
- Read chapter 9 of text.

Evaluation Devices:
- Observation.
- Performance Projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Course Competency: 13.00 Assemble one up flats with line, and screened images for the small format.

Performance Objectives:

3.01 Using the equipment trained on, position line and screened images as per the instructions on the paste-up with 100% accuracy.

Activities and Resources:
- Participate in Lecture/Demonstrations.
- Read chapter 9 of text.

Evaluation Devices:
- Observation.
- Performance Projects.
Unit No. 14

Course: Preparatory Program for Southeast Asians - Printing & Publishing

Unit Title: Duplicator Makeready

Course Competency: Demonstrate the ability to makeready, adjust, and print copies on a single color duplicator.

Performance Objectives:

14.01 Using a duplicator that was used for training, adjust the feeder, register, and delivery systems so that with 60 or 70lb. offset paper, there is no more than 25% waste.

14.02 Using a duplicator that was used for training, mount a plate and blanket according to the manufacturers specifications.

14.03 Using a duplicator that was used for training, prepare the inking and dampening systems for running a job with medium coverage.

14.04 Using a duplicator that was used for training, and using 60 or 70lb. offset paper, set up and maintain register and color so that there is no more than 25% waste.

Activities and Resources:

Participate in Lecture/Demonstrations.

Complete assigned exercises.

Evaluation Devices:

Performance projects.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Unit Title: Pressroom Safety

Course Competency: Demonstrate safe practices in the pressroom.

Performance Objectives:

15.01 Using the facilities used for training, demonstrate fire safety awareness.

15.02 Using a duplicator that was used for training, point out the safeties and describe the possible consequence of an inoperable one, with 100% accuracy.

15.03 Using the facilities used for training, demonstrate safe housekeeping practices.

Activities and Resources:

Participate in Demonstrations.

Complete assigned exercises.
Course: Preparatory Program for Southeast Asians - Printing & Publishing

Unit Title: Hazardous Materials

Course Competency: Demonstrate the proper handling and disposal of hazardous materials.

Performance Objectives:

16.01 Given an MSDS sheet, identify the risks associated with the substance.

16.02 Given the facilities used for training, demonstrate proper disposal of all waste products generated by the presswork.

Activities and Resources:

Participate in Demonstrations.

Read handout - "How to read and understand material safety data sheets."

Evaluation Devices:

Observation.
COURSE NUMBER:  
COURSE TITLE: ESL Physical Science  
CREDIT:  
COURSE DESCRIPTION:  
This course is a basic ESL physical science course. General topics covered include laboratory safety, measurement, properties of matter, chemical nature of matter, energy, heat energy, mechanical energy, electricity, magnets and electricity, light energy, sound energy, basic reading and study skills (including locating and interpreting resources), vocabulary building, and awareness of scientific strategies.

Corequisites:  
Prerequisites:  
REQUIRED BOOKS:  
Title: Hands-on Physical Science  
Publisher: The Peoples Publishing Group, Inc.  
Author: Marilynne W. Mathias and Robert A. Johnson, Ph.D.  
Copyright: 1983

SPECIALS REQUIRED FOR COURSE: (include approximate quantity per student)  

Date of Review/Revision: 6/9/93  
Reviewed/Prepared by: Frank Fernandes, Ellen Dell, Gail Hurd, and Mary Daly  

BEST COPY AVAILABLE
## COURSE COMPETENCIES

<table>
<thead>
<tr>
<th>The student will be able to:</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.00 Develop and demonstrate a general understanding of laboratory safety.</td>
<td>Unit 1</td>
</tr>
<tr>
<td>02.00 Understand the English and metric systems of measurement and learn to analyze data graphically.</td>
<td>Unit 1</td>
</tr>
<tr>
<td>03.00 Recognize and explain basic properties of solids, liquids, and gases.</td>
<td>Unit 2</td>
</tr>
<tr>
<td>04.00 Discuss basic methods of thermal energy transfer.</td>
<td>Unit 2</td>
</tr>
<tr>
<td>05.00 Understand mechanical energy as it relates to simple machines.</td>
<td>Unit 3</td>
</tr>
<tr>
<td>06.00 Understand the concepts of basic DC electricity.</td>
<td>Unit 3</td>
</tr>
<tr>
<td>07.00 Identify the concepts of magnetism and electromagnetism.</td>
<td>Unit 4</td>
</tr>
<tr>
<td>08.00 Recognize and understand the basic principles of light and sound.</td>
<td>Unit 4</td>
</tr>
</tbody>
</table>
ESL PHYSICAL SCIENCE
RESOURCES


NTC teacher prepared Lab Manual, lab activities #1-15

Educational insights: Project kits with 35 experiments

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>EI-7154</td>
<td>Color and light</td>
</tr>
<tr>
<td>EI-7155</td>
<td>Magnetism</td>
</tr>
<tr>
<td>EI-7157</td>
<td>How Things Work</td>
</tr>
<tr>
<td>EI-7152</td>
<td>Electricity</td>
</tr>
</tbody>
</table>

Instructional Fair, Inc.: Resource books with posters

Logic Anyone, Blackline Master
### Performance Objective(s) and Tasks

<table>
<thead>
<tr>
<th>Objective</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define science.</td>
<td>Discussion</td>
<td>Hands-on Science text series</td>
<td>Teacher-made quiz</td>
</tr>
<tr>
<td>Name and explain the general functions of the three branches of science.</td>
<td>List and define in a chart</td>
<td>Hands-on Science text series</td>
<td>75 percent mastery</td>
</tr>
<tr>
<td>Name the five steps of the scientific method.</td>
<td>List and define</td>
<td>Hands-on Science text series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Include in student notebook</td>
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<td></td>
</tr>
</tbody>
</table>
# Lab Safety

**Course Competency:** Develop and demonstrate a general understanding of laboratory safety.

**Performance Objective(s) and Tasks**

<table>
<thead>
<tr>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss the importance of safe conduct in the laboratory.</td>
<td>Video: Safety</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify safe and unsafe lab practices.</td>
<td>Examine pictures of lab students. List unsafe practices demonstrated by students.</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify safe and unsafe chemicals in the home.</td>
<td>Display household items. Label each as safe or unsafe. Note safety first aid instructions on label.</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify fire extinguishers.</td>
<td>Locate and explain how and when to use.</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify eye protection.</td>
<td>Indicate when safety glasses should be worn. Locate and explain how to use eyewash.</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify chemicals.</td>
<td>Correct procedure when handling chemicals</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify First Aid kit.</td>
<td>Locate and explain contents and use</td>
<td>Teacher observation</td>
</tr>
</tbody>
</table>
# Systems of Measurement

**Course Competency:** Understand the English and metric systems of measurement and learn to analyze data graphically.

## Performance Objective(s) and Tasks

<table>
<thead>
<tr>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculate the area of a square and triangle.</td>
<td>Teacher-made worksheets involving student measurement skills</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Understand units of mass, length, and volume in the English and metric systems.</td>
<td>Containers from supermarket. Compare English and metric units of mass, volume, and length. Calculate the volume of a cereal box.</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Calculate the density of an object using its mass and volume.</td>
<td>Lab Activities 1 and 2</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Recognize temperatures in centigrade and Fahrenheit scales.</td>
<td>Students measure temperatures and record. Graph measured data.</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Identify the steps of scientific method to everyday life problems.</td>
<td>Teacher-made worksheets on problem solving and sequencing</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Illustrate the difference between direct proportion and indirect proportion in data analysis.</td>
<td>Students compute ratio and proportion on teacher-made worksheets</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Describe the effects of gravity, friction, and centripetal force.</td>
<td>Lift and drop a brick, rub your hands together, and spin a top.</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Give examples of inertia.</td>
<td>&quot;Try This&quot; #20 and 21</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>State information about Galileo and Sir Isaac Newton.</td>
<td>Show inactive matter</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td></td>
<td>Library research and write a short paper</td>
<td>Teacher-made test</td>
</tr>
</tbody>
</table>

**Resources (Ref., Instructional Aids):**
- Teacher-made worksheets involving student measurement skills
- Containers from supermarket. Compare English and metric units of mass, volume, and length. Calculate the volume of a cereal box.
- Lab Activities 1 and 2
- Students measure temperatures and record. Graph measured data.
- Teacher-made worksheets on problem solving and sequencing
- Students compute ratio and proportion on teacher-made worksheets
- Lift and drop a brick, rub your hands together, and spin a top.
- "Try This" #20 and 21
- Show inactive matter

**Evaluation Devices:**
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency
- Teacher-made test 75 percent proficiency

---

**Instructor(s):** F. Fernandes, E. Dell, G. Hurd, and M. Dail

**Course Number and Title:** ESL Physical Science

**Course Number and Title:** ESL Physical Science
<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss the purpose of the periodic table.</td>
<td>Research library for information about the significance of the periodic table</td>
<td>Matter and Energy, p. 20</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Explain elements, compounds, and types of chemical bonds.</td>
<td>Look at samples of elements, compounds, and chemicals</td>
<td>Matter and Energy, p. 20</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify parts and arrangement of periodic table.</td>
<td>Locate and label on a periodic table metals, nonmetals, group, and period</td>
<td>Reproduce periodic table</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Interpret information about selected elements.</td>
<td>Identify elements from their symbols</td>
<td>Matter and Energy, p. 20</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Identify the elements that make up various compounds</td>
<td>Use periodic table</td>
<td></td>
</tr>
</tbody>
</table>
**Course Competency:** (03.00) Recognize and explain basic properties of solids, liquids, and gases.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define a chemical.</td>
<td>Explain how atoms combine</td>
<td>Basic Physical Science</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Distinguish between the two main types of bonds.</td>
<td>Give examples of compounds that illustrate each type of bond</td>
<td>Matter and Energy, p. 24</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Identify which type of bond is chemically stronger.</td>
<td>Demonstrate the dissolution of salt in water to illustrate a weak bond</td>
<td>Basic Physical Science</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
</tbody>
</table>
## Unit No: 6

### Unit Title: Chemical Reactions

#### Course Competency:
(01.00) Recognize and explain basic properties of solids, liquids, and gases.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distinguish reactions and products in a chemical reaction.</td>
<td>Demonstrate for students how a chemical reaction is similar to following a set of cooking or baking directions. &quot;Chemical reaction is a recipe for chemists.&quot;</td>
<td>Concepts and Challenges in Physical Science, p. 46</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Discuss the importance of balancing chemical reactions.</td>
<td>Illustrate how a recipe is balanced (similar to a chemical reaction)</td>
<td>Concepts and Challenges in Physical Science, p. 49</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Recognize some general types of chemical reactions.</td>
<td>Have students classify a group of reactions by identifying which type it represents</td>
<td>Concepts and Challenges in Physical Science, pp. 48 and 49</td>
<td>Teacher observation</td>
</tr>
<tr>
<td></td>
<td>Demonstrate various types of chemical reactions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Performance Objective(s) and Tasks | Activities | Resources (Ref., Instructional Aids) | Evaluation Devices
--- | --- | --- | ---
Explain what an atom is and identify its parts. | Draw a simple model of an atom; label nucleus, energy (or electron) ring | Concepts and Challenges in Physical Science, p. 3 | Teacher-made test
Explain what a molecule is and describe differences between an atom. | Draw a simple model of a molecule with a ball and stick | Concepts and Challenges in Physical Science, p. 40 | Teacher-made test
Share the history of the discovery of the atom. | List the four points in Dalton’s atomic theory | Library research | Teacher observation
Describe the difference between mixtures and compounds, compounds and elements. | Look at samples of mixtures, compounds, and elements | Concepts and Challenges in Physical Science, p. 34 | Teacher-made test
List the properties of matter. | Teacher-made worksheets—students showing mass and weight | Matter and Energy, p. 8 | Teacher-made test
List and give examples of the states of matter. | Classify objects into liquid, gas, or solid | Matter and Energy, p. 9 | Teacher-made test
Have students describe physical and chemical changes | "Try This" #1-5 | Teacher-made test | 75 percent proficiency
Define density and explain why it is the same for different amounts of the same material. | Teacher-made worksheet | Teacher-made test | 75 percent proficiency
Describe what determines whether an object will sink or float in a fluid. | Provide different containers and a tub of water for student participation | Teacher-made worksheet | Text

ESL Physical Science
F. Fernandes, E. Dell, G. Hurd, and M. Daly
Course Competency: (04.00) Discuss basic methods of thermal energy transfer.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the ways heat moves.</td>
<td>Measure and record temperature at various locations in room using Fahrenheit and Celsius</td>
<td>Matter and Energy, p. 63</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>List materials that are good insulators and those that are good conductors.</td>
<td>Have students group materials which are good conductors and poor conductors</td>
<td>Matter and Energy, p. 65</td>
<td>Teacher observation</td>
</tr>
</tbody>
</table>
| Define temperature and explain how it is measured. | "Try This" #22 and 23  
Lab 7 | Lab Manual | |
| Understand how heat causes matter to change phases. | Demonstrate ring and ball bimetallic strips, various thermos bottles, dented ping-pong balls in boiling water, pyrometer  
Lab 7 | Matter and Energy, p. 58 | Teacher observation |
| Define heat transfer by conduction, convection, and radiation. | Discuss heat and contraction and heat and expansion use  
"Try This" #34-36  
Solid and liquid examples | Matter and Energy, p. 81 | Teacher-made test  
75 percent proficiency |
| Describe methods to save heat energy. | Demonstrate heat moving by touching, heat rising, and heat rays  
"Try This" #22-28  
Lab Manual Activity 7 | Matter and Energy, p. 68 | Teacher observation |
| List and define different sources of energy. | Discuss insulation  
"Try This" #29 and 30 | Matter and Energy, p. 77 | Chapter checkup  
Matter and Energy, p. 82, 75 percent proficiency |
| Identify one benefit and one problem with each source of energy. | Discuss fossil fuel, nuclear, solar, and wind energy | Teacher-made test  
75 percent proficiency | Teacher-made test  
75 percent proficiency |
<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the six simple machines.</td>
<td>Provide examples of lever, pulley, screw, incline plane, wedge, wheel and axle</td>
<td>Matter and Energy, p. 93</td>
<td>Teacher-made tests</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #38-46</td>
<td></td>
<td>75 percent proficiency</td>
</tr>
<tr>
<td>Identify the simple machines that make up everyday tools.</td>
<td>Classify common tools into categories</td>
<td>Matter and Energy, p. 93</td>
<td>Teacher observation</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #38-46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain the phrase &quot;mechanical advantage.&quot;</td>
<td>Demonstrate using simple tools</td>
<td>Matter and Energy, p. 93</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Give examples in which the mechanical advantage of a machine is (a) greater than one and (2) less than one.</td>
<td>Class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain why no machine can have an efficiency of 100 percent.</td>
<td></td>
<td>Teacher-made</td>
<td>Teacher observation</td>
</tr>
</tbody>
</table>
## Basic Concepts of Basic DC Electricity

**Course Competency:** Understand the concepts of basic DC electricity.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand that there exists two kinds of electricity—static and current.</td>
<td>Students determine static and current electricity</td>
<td>Matter and Energy, p. 120</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Determine whether current will pass through a bulb.</td>
<td>Lab 10</td>
<td>Matter and Energy, p. 121</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Predict what will happen in a series circuit if there is a break at any point.</td>
<td>Provide diagram showing the bulb connected by wire to a battery</td>
<td>Matter and Energy, p. 122</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Interpret a simple schematic diagram of a circuit.</td>
<td>&quot;Try This&quot; #48</td>
<td>Matter and Energy, p. 123</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Distinguish between switches, fuses, and circuit breakers.</td>
<td>Use a light bulb with a broken filament and a light bulb without a broken filament</td>
<td>Matter and Energy, p. 130</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Be able to read a kilowatt meter.</td>
<td>Construct a circuit using a battery and light bulb</td>
<td>Teacher observation</td>
<td></td>
</tr>
<tr>
<td>Explain the relationship between electrons and electricity.</td>
<td>&quot;Try This&quot; #49 and 50</td>
<td>Lab Manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lab 12</td>
<td>&quot;Try This&quot; 151</td>
<td>BEST COPY AVAILABLE</td>
</tr>
<tr>
<td></td>
<td>Show examples and have students label</td>
<td>Lab Manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide kilowatt meter and let students measure kilowatts</td>
<td>Lab Manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expand on conduction using scientific terms</td>
<td>Matter and Energy, p. 127</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
</tr>
<tr>
<td>-----------------------------------</td>
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</tr>
<tr>
<td>Name the properties of magnets.</td>
<td>Students use magnets to attract or repel classroom objects</td>
<td>Matter and Energy, p. 143</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Interpreting the strength of a magnetic field at different points near a magnet from the pattern formed by the iron filings.</td>
<td>Provide iron fillings for students to form a magnetic field</td>
<td>Matter and Energy, p. 146</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Understanding what is meant by an electromagnet.</td>
<td>Students measure electricity usage by various appliances</td>
<td>Lab Manual</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Listing factors that could destroy magnetism.</td>
<td>Teacher-made</td>
<td>Matter and Energy, p. 147</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Explaining and understanding how the earth can be perceived to be a giant bar magnet.</td>
<td>Use maps to locate North and South Pole, provide compasses to show needle always points north</td>
<td>Lab Manual</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Understanding the workings of motors and generators related to magnetism.</td>
<td>Diagram and label simple motor</td>
<td>Matter and Energy, p. 152</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>List a few basic facts about light.</td>
<td>Teacher-made worksheets</td>
<td>Matter and Energy, p. 167</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Showing importance of light, speed of light, and where we get</td>
<td>Lab Activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; $66-68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Define illumination and light intensity.</td>
<td>Teacher-made worksheets</td>
<td>Matter and Energy, p. 172</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Lab Activity #14</td>
<td>Video: Color</td>
<td></td>
</tr>
<tr>
<td>Measure illumination with the help of a light meter.</td>
<td>Use light meter to measure light reflected off various surfaces</td>
<td>Lab Manual</td>
<td>Teacher observation</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understand the meaning of reflection and refraction of light.</td>
<td>Demonstrations showing refraction using He-Ne laser, color wheel, color mixer</td>
<td>Matter and Energy, p. 173</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Understand what color is and list factors that determine the color of an object.</td>
<td>Make a prism</td>
<td>Matter and Energy, p. 187</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Label colors on a spectrum</td>
<td>Lab Activities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #80-82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Briefly explain the term &quot;optical illusion&quot; and give examples.</td>
<td>Lab Activity #15</td>
<td>Lab Manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #81-88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe the properties of sound.</td>
<td>Class discussion about sound</td>
<td>Matter and Energy, p. 195</td>
<td></td>
</tr>
<tr>
<td>List a few basic facts about sound.</td>
<td>Teacher-made worksheets showing how sound travels</td>
<td>Matter and Energy, p. 196</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #83-88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understand sound acoustics.</td>
<td>Class discusses echoes and how to avoid</td>
<td>Matter and Energy, p. 210</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #94 and 95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COURSE NUMBER:

COURSE TITLE: ESL Earth Science and Geography

CREDIT:

COURSE DESCRIPTION:

This course is a basic ESL earth science course. General topics covered include makeup of the Earth, the changing earth, climate, weather and atmosphere, history of the earth, oceans, astronomy, maps, ecology, basic reading and study skills (including locating and interpreting resources), vocabulary building, and awareness of scientific strategies.

Corequisites:

Prerequisites:

REQUIRED BOOKS:

Title: Hands-on Science: Earth Below and Sky Above
Publisher: The Peoples Publishing Group, Inc.
Author: Marilynne W. Mathias and Robert A. Johnson, Ph.D.
Copyright: 1983

SUPPLIES REQUIRED FOR COURSE: (include approximate quantity per student)

Date of Review/Revision: 6/93
Reviewed/Prepared by: Gail Hurd and Ellen Dell
The student will:

01.00 Learn basic facts about the planet Earth.

02.00 Understand major rock forms that make up the Earth's crust and of the forces and processes that change the surface.

03.00 Discuss the history of our planet and how scientists date rocks and fossils.

04.00 Expand knowledge of the Earth's atmosphere and of its importance.

05.00 Be able to discuss climate, the different kinds of weather, and the prediction of weather.

06.00 Expand knowledge of the features of the ocean floor, waves, tides, currents, and of the importance of the sea to life on Earth.

07.00 Learn of astronomical discoveries and obtain some perspective on where the Earth fits into the "big picture."

08.00 Observe and use a variety of maps and globes.

09.00 Expand knowledge of environmental issues, including rain forests, wetlands, and water.

10.00 Identify toxic substances.

11.00 Identify sources of air pollution.

12.00 Recognize the benefits of recycling.

GOAL.078, 6/10/93
ESL EARTH SCIENCE AND GEOGRAPHY

RESOURCES


Logic Anyone, Blackline Master

Educational insights: Project kits with 35 experiments

EI-7158 Weather and Space

Instructional Fair, Inc.: Resource books with posters

IF8806 Earth Science
IF8805 Our Solar System
IF880X The Human Body
Unit No: 1

Unit Title: What is Science? Overview of Science.

Course Competency: (01.00) Learn basic facts about the planet Earth.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aides)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define science.</td>
<td>Discussion</td>
<td>Hands-on Science text series</td>
<td>Teacher-made quiz</td>
</tr>
<tr>
<td>Name and explain the general functions of the three branches of science.</td>
<td>List and define in a chart</td>
<td>Hands-on Science text series</td>
<td>75 percent mastery</td>
</tr>
<tr>
<td>Name the five steps of the scientific method.</td>
<td>List and define</td>
<td>Hands-on Science text series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Include in student notebook</td>
<td>Hands-on Science text series</td>
<td></td>
</tr>
<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
</tr>
<tr>
<td>-----------------------------------</td>
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</tr>
<tr>
<td>Define earth science.</td>
<td>General outline</td>
<td>Earth Below and Sky Above</td>
<td></td>
</tr>
</tbody>
</table>
Unit No: 3

Unit Title: The Earth's Features

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (02.00) Understand major rock forms that make up the Earth's crust and of the forces and processes that change the surfaces. (03.00) Discuss the history of our planet and how scientists date rocks and fossils.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name and describe the Earth's three layers.</td>
<td>List and identify crust, mantle, and core. Use teacher-made worksheets showing cross section of the Earth.</td>
<td>Earth Below and Sky Above, p. 8</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>List the geological era and characteristics of each era.</td>
<td>Teacher-made worksheets. &quot;Try This&quot; #20</td>
<td>Earth Below and Sky Above, p. 54</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Explain ways scientists date rocks.</td>
<td>Class discussion</td>
<td>Text</td>
<td>Teacher observation</td>
</tr>
</tbody>
</table>

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<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
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<tr>
<td>Describe the theory of plate tectonics.</td>
<td>Discuss possible theories how the Earth's surface was formed</td>
<td>Textbook</td>
<td></td>
</tr>
<tr>
<td>Explain what causes earthquakes and volcanoes.</td>
<td>Define earthquake and fault. Locate on a map the San Andreas Fault. Explain Richter scale and how scientists use.</td>
<td>Earth Below and Sky Above, p. 45</td>
<td>Teacher-made tests 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Define volcano, volcanic eruption, and lava. Locate active and inactive volcanoes on a map.</td>
<td>Earth Below and Sky Above, p. 51</td>
<td>Teacher-made tests 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #17 and 18</td>
<td>Lab Activity 19</td>
<td></td>
</tr>
<tr>
<td>Explain how mountains are formed.</td>
<td>Discuss faulting and folding. Compare and contrast a volcano and a mountain.</td>
<td>Earth Below and Sky Above, p. 36</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
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<td>Lab Activity 18</td>
<td></td>
</tr>
<tr>
<td>Name the three main types of rock in the Earth's crust.</td>
<td>Classify different rocks into igneous, sedimentary, and metamorphic. Identify minerals and use to help classify rocks.</td>
<td>Earth Below and Sky Above, p. 36</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #3, 4, 5, and 7</td>
<td></td>
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</tr>
<tr>
<td>Describe the process of weathering and erosion.</td>
<td>Discuss what makes up soil. Identify causes and effects of erosion.</td>
<td>Earth Below and Sky Above, p. 40</td>
<td>Teacher observation</td>
</tr>
<tr>
<td></td>
<td>Class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #16</td>
<td></td>
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</tr>
</tbody>
</table>
Unit No: 5
Unit Title: The Earth's Atmosphere

Course Competency: (04.00) Expand knowledge of the Earth's atmosphere and of its importance.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the makeup of the atmosphere.</td>
<td>Teacher-made worksheets identifying components of atmosphere</td>
<td>Earth Below and Sky Above, p. 66</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Explain how air pressure is related to winds and convection currents.</td>
<td>Define air pressure and the effects on weather</td>
<td>Earth Below and Sky Above, p. 68</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>&quot;Try This&quot; #24-26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Describe the different cloud forms and precipitation.</td>
<td>Class discussion</td>
<td>Earth Below and Sky Above, p. 91</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>&quot;Try This&quot; #36-38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Performance Objective(s) and Tasks

<table>
<thead>
<tr>
<th>Explain the differences between weather and climate.</th>
<th>Define, compare, and contrast weather and climate</th>
<th>Earth Below and Sky Above, p. 65</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Try This&quot; #22 and 23</td>
<td>Teacher-made tests 75 percent proficiency</td>
</tr>
<tr>
<td>Describe air pressure and how it affects weather.</td>
<td>Class discussion</td>
<td>Earth Below and Sky Above, p. 68</td>
</tr>
<tr>
<td></td>
<td>Reinforcing concepts with lab activities</td>
<td>Teacher observation</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #24-26</td>
<td></td>
</tr>
<tr>
<td>Describe storms--cyclone, hurricane, tornado, and typhoon.</td>
<td>Discuss changes in the atmosphere which cause dangerous weather</td>
<td>Earth Below and Sky Above, p. 115</td>
</tr>
<tr>
<td></td>
<td>Read weather maps</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Share information on the job of weather forecaster.</td>
<td>Guest speaker and library research</td>
<td>Earth Below and Sky Above, p. 107</td>
</tr>
<tr>
<td></td>
<td></td>
<td>75 percent completion of teacher criteria</td>
</tr>
</tbody>
</table>
Unit No: 7
Unit Title: The Earth's Oceans

NORTHCENTRAL TECHNICAL COLLEGE
Wausau, Wisconsin

Course Number and Title: ESL Earth Science and Geography

Instructor(s): G. Hurd and E. Dell

Course Competency: (06.00) Expand knowledge of the features of the ocean floor, waves, tides, currents, and of the importance of the sea to life on Earth.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain the importance of the sea to life on earth.</td>
<td>Teacher-made worksheets locating oceans</td>
<td>Earth Below and Sky Above, p. 121</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Define and explain waves, tides, and currents.</td>
<td>List ocean resources</td>
<td>Earth Below and Sky Above, p. 121</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Discuss relationship of moon, sun, and earth</td>
<td>Earth Below and Sky Above, p. 131</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Examine tide charts</td>
<td>Text</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Describe three features of the ocean floor.</td>
<td>Teacher-made worksheets identifying sections of the ocean floor</td>
<td></td>
</tr>
</tbody>
</table>
Course Competency: (07.00) Learn of astronomical discoveries and obtain some perspective on where the Earth fits into the "big picture."

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the nine planets in the solar system.</td>
<td>Identify planets and relationship to earth and the sun</td>
<td>Earth Below and Sky Above, p. 144</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Share information on two important events in space exploration.</td>
<td>&quot;Try This&quot; #50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explain the difference between meteors and meteorites.</td>
<td>Class discussion</td>
<td>Earth Below and Sky Above, p. 165</td>
<td>75 percent proficiency of teacher criteria</td>
</tr>
<tr>
<td>Explain the movement of the Earth through the solar system.</td>
<td>Library research</td>
<td>Earth Below and Sky Above, p. 161</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td></td>
<td>Class discussion</td>
<td>Earth Below and Sky Above, p. 137</td>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
</tbody>
</table>
Unit No: 9  
Unit Title: Reading Maps and Globes

Course Competency: (08.00) Observe and use a variety of maps and globes.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locate water and land forms on a globe.</td>
<td>Teacher-made worksheets with oceans and continents</td>
<td>Globe</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify symbols and direction on a map.</td>
<td>Locate local information on a map</td>
<td>Local, state, U.S., and world maps</td>
<td>Teacher observation and worksheets</td>
</tr>
<tr>
<td>Identify and interpret the map scale.</td>
<td>Teacher-made worksheets using local maps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify and differentiate between relief, political, and climatic maps.</td>
<td>Observation of a variety of maps</td>
<td>Maps—relief, political, and climate</td>
<td>Teacher observation and worksheets</td>
</tr>
<tr>
<td>Identify and compare elevations.</td>
<td>Define latitude, longitude, hemisphere, and related terms</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation and worksheets</td>
</tr>
<tr>
<td>Identify and use a legend.</td>
<td>Preparing map of local area</td>
<td>Maps and globes</td>
<td>Teacher observation and worksheets</td>
</tr>
<tr>
<td>Identify time zones.</td>
<td>Mathematically determine time zones in given locations</td>
<td>Variety of maps</td>
<td>Teacher observation and worksheets</td>
</tr>
</tbody>
</table>

Course Number and Title: ESL Earth Science and Geography  
Instructor(s): G. Hurd and E. Dell
### Course Competency:
(09.00) Expand knowledge of environmental issues, including rain forests, wetlands, and water.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe results of destruction of the rain forests.</td>
<td>Locate rain forests on a map. Explain importance of rain forests.</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Define two methods of logging.</td>
<td>Class discussion</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Identify the importance of wetlands.</td>
<td>Define and illustrate effects on food chain</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>List three natural processes that reduce the amount of land available.</td>
<td>Class discussion</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
</tbody>
</table>
### Performance Objective(s) and Tasks

<table>
<thead>
<tr>
<th>Water Resources</th>
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</thead>
<tbody>
<tr>
<td>Illustrate the hydrologic cycle.</td>
</tr>
<tr>
<td>Give examples of human use of water.</td>
</tr>
<tr>
<td>Describe the distribution of groundwater.</td>
</tr>
<tr>
<td>List the benefits and drawbacks of dam construction.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activities</th>
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<tbody>
<tr>
<td>Class discussion locating parts of the water cycle</td>
</tr>
<tr>
<td>Class discussion involving real-life experiences using water</td>
</tr>
<tr>
<td>Teacher-made worksheets</td>
</tr>
<tr>
<td>Define dams and illustrate positive and negative features</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Resources (Ref., Instructional Aids)</th>
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</thead>
<tbody>
<tr>
<td>Teacher-made worksheets</td>
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<tr>
<td>Earth Below and Sky Above, p. 97</td>
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<tr>
<td>Teacher-made worksheets</td>
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<tr>
<td>Earth Below and Sky Above, p. 97</td>
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<td>Teacher-made worksheets</td>
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<tr>
<td>Earth Below and Sky Above, p. 97</td>
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</tbody>
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<tr>
<th>Evaluation Devices</th>
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<tbody>
<tr>
<td>Teacher-made test 75 percent proficiency</td>
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<tr>
<td>Teacher-made test 75 percent proficiency</td>
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<tr>
<td>Teacher-made test 75 percent proficiency</td>
</tr>
<tr>
<td>Teacher observation</td>
</tr>
</tbody>
</table>
### Performance Objective(s) and Tasks

<table>
<thead>
<tr>
<th>Identify toxic substances.</th>
<th>Class discussion about poisons</th>
<th>Teacher-made worksheets</th>
<th>Teacher observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>List sources of hazardous chemicals.</td>
<td>Define hazardous chemicals and identify</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Define noise and its effects.</td>
<td>Class discussion drawing from real-life experiences</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Contrast the two types of pesticides.</td>
<td>Define and discuss pesticides, both chemicals and natural</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Describe the reason DDT was banned.</td>
<td>Class discussion</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>List and describe other methods of pest control.</td>
<td>Teacher-made worksheets showing different methods of controlling pests</td>
<td>Teacher-made worksheets</td>
<td>Teacher observation</td>
</tr>
<tr>
<td>Define herbicide.</td>
<td>Class discussion on pollution and effects</td>
<td>Teacher-made worksheets</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>List reasons why groundwater pollution is so serious.</td>
<td>Class discussion</td>
<td>Teacher-made worksheets</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>Describe the effects of groundwater pollution.</td>
<td>Class discussion</td>
<td>Teacher-made worksheets</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>List sources of ocean pollution.</td>
<td>Class discussion on illegal dumping, chemical spills, and pollution</td>
<td>Teacher-made worksheets</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>List the gases that make up the atmosphere.</td>
<td>Define air and properties</td>
<td>Teacher-made</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>List sources of air pollution.</td>
<td>Class discussion on air pollution causes and effects</td>
<td>Teacher-made</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>Describe the production of acid rain.</td>
<td>Draw from real-life experiences illustrating acid rain</td>
<td>Teacher-made</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>List some effects of acid rain.</td>
<td>Class discussion</td>
<td>Teacher-made</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>List ways to protect indoor air quality.</td>
<td>Class discussion</td>
<td>Teacher-made</td>
<td>Teacher-made test (75 percent proficiency)</td>
</tr>
<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
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</tr>
<tr>
<td>List three methods of waste disposal.</td>
<td>Class discussion regarding waste management</td>
<td>Teacher-made</td>
<td>Teacher-made</td>
</tr>
<tr>
<td>Describe reasons for recycling.</td>
<td>Define landfills and problems of lack of decomposing waste</td>
<td>Teacher-made</td>
<td>Teacher-made</td>
</tr>
<tr>
<td>List methods of recycling.</td>
<td>Identify household items and how to recycle</td>
<td>Teacher-made</td>
<td>Teacher-made</td>
</tr>
</tbody>
</table>
COURSE TITLE: ESL Life Science

COURSE DESCRIPTION:
This course is a basic ESL biology course. General topics covered include the definition of life, cell studies, taxonomy, plant life, genetics, human and animal systems, health, the balance of nature, basic reading and study skills (including locating and interpreting resources), vocabulary building, and awareness of scientific strategies.

Corequisites:
Prerequisites:

REQUIRED BOOKS:
Title: Hands-on Life Science
Publisher: The Peoples Publishing Group, Inc.
Author: Stephan A. Martin and Joseph Starowicz
Copyright: 1988

SUPPLIES REQUIRED FOR COURSE: (include approximate quantity per student)

Date of Review/Revision: 6/9/93
Reviewed/Prepared by: Beth Dickinson, Ellen Dell, and Gail Hurd
<table>
<thead>
<tr>
<th>COURSE COMPETENCIES</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student will be able to:</td>
<td></td>
</tr>
<tr>
<td>01.00 Explain, define, and/or give examples of the vocabulary words and terminology</td>
<td>General</td>
</tr>
<tr>
<td>appropriate to each unit covered.</td>
<td>competency</td>
</tr>
<tr>
<td>02.00 List and/or describe the major structures in each organ system covered and</td>
<td>General</td>
</tr>
<tr>
<td>their functions.</td>
<td>competency</td>
</tr>
<tr>
<td>03.00 Properly use and identify the parts of a light microscope and identify</td>
<td>General</td>
</tr>
<tr>
<td>structures viewed on microscope slides.</td>
<td>competency</td>
</tr>
<tr>
<td>04.00 Name the traits common to all living organisms.</td>
<td>General</td>
</tr>
<tr>
<td>05.00 Distinguish between plant and animal cells and between cells and tissues.</td>
<td>Unit 1</td>
</tr>
<tr>
<td>06.00 Define and understand the necessity of taxonomy.</td>
<td>Unit 2</td>
</tr>
<tr>
<td>07.00 Identify the major characteristics of the classes or phyla of the animal,</td>
<td>Unit 2</td>
</tr>
<tr>
<td>plant, and protista kingdoms.</td>
<td></td>
</tr>
<tr>
<td>08.00 Discuss the importance of plants.</td>
<td>Unit 3</td>
</tr>
<tr>
<td>09.00 Identify the parts of plants, differences, and what the plant structures do.</td>
<td>Unit 3</td>
</tr>
<tr>
<td>10.00 Describe the importance of chlorophyll and photosynthesis, the purpose and</td>
<td>Unit 3</td>
</tr>
<tr>
<td>function.</td>
<td></td>
</tr>
<tr>
<td>11.00 Identify and/or describe the structures and functions of the various organ</td>
<td>Unit 4</td>
</tr>
<tr>
<td>systems.</td>
<td></td>
</tr>
<tr>
<td>12.00 Describe the importance of genes and traits and how they are passed on to</td>
<td>Unit 5</td>
</tr>
<tr>
<td>future generations.</td>
<td></td>
</tr>
<tr>
<td>13.00 List the ways the body protects against diseases.</td>
<td>Unit 6</td>
</tr>
<tr>
<td>GOAL.070, 6/9/93</td>
<td></td>
</tr>
</tbody>
</table>
## COURSE COMPETENCIES

<table>
<thead>
<tr>
<th>The student will be able to:</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.00 List or describe the effects of drugs, alcohol, and tobacco on the body.</td>
<td>Unit 6</td>
</tr>
<tr>
<td>15.00 List and discuss the main forms of nutrition, what they supply, and where they are found.</td>
<td>Unit 6</td>
</tr>
<tr>
<td>16.00 List the seven basic requirements for good physical and mental health.</td>
<td>Unit 6</td>
</tr>
<tr>
<td>17.00 Explain the relationships of various communities, populations, and ecosystems.</td>
<td>Unit 7</td>
</tr>
</tbody>
</table>

**GOAL.070, 6/9/93**


**Course Competency:**

(01.00) Explain, define, and/or give examples of the vocabulary words and terminology appropriate to each unit covered.  
(02.00) List and/or describe the major structures in each organ system covered and their functions.  
(03.00) Properly use and identify the parts of a light microscope and identify structures viewed on microscope slides.  
(04.00) Name the traits common to all living organisms.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define science.</td>
<td>Discussion</td>
<td>Hands-on Science text series</td>
<td>Teacher-made quiz</td>
</tr>
<tr>
<td>Name and explain the general functions of the three branches of science.</td>
<td>List and define in a chart</td>
<td>Hands-on Science text series</td>
<td>75 percent mastery</td>
</tr>
<tr>
<td>Name the five steps of the scientific method.</td>
<td>List and define</td>
<td>Hands-on Science text series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Include in student notebook</td>
<td>Hands-on Science text series</td>
<td></td>
</tr>
</tbody>
</table>

**Unit No:** 1  
**Unit Title:** What is Science? Overview of Science.
## Performance Objective(s) and Tasks

<table>
<thead>
<tr>
<th>List the five main characteristics of life.</th>
<th>Read and discuss text, Chapters 1-5</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give three examples of how an organism responds to its environment.</td>
<td>Compare photos of living/inanimate objects</td>
<td>Microscope and slides</td>
</tr>
<tr>
<td>Describe cells and their parts. Contrast plant and animal cells.</td>
<td>Use a microscope to look at premade and fresh-mount slides</td>
<td>WPS video, Vol. 19, Issue 1, &quot;Technology, the Microscope, an Indispensable Instrument&quot;</td>
</tr>
<tr>
<td>Describe how cells get and use energy.</td>
<td>Do &quot;Try This&quot; 1-8</td>
<td>Optional: Computer program</td>
</tr>
<tr>
<td>Identify the parts of the microscope and use it correctly.</td>
<td>Chapter 3, &quot;Things to Do&quot;</td>
<td>&quot;Cells: Structure and Function,&quot; Scott, Foresman Biology Courseware Series for Apple II, 1985, Glenview, IL</td>
</tr>
<tr>
<td>Define tissue and list the main types.</td>
<td>Examine models</td>
<td>Optional: Computer worksheets</td>
</tr>
<tr>
<td></td>
<td>Examine &quot;Typical Cells Chart&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discuss unit review</td>
<td></td>
</tr>
</tbody>
</table>
Course Competency: (06.00) Define and understand the necessity of taxonomy. (07.00) Identify the major characteristics of the classes or phyla of the animal, plant, and protista kingdoms.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain why a classification system of organisms is important.</td>
<td>Read and discuss text, Chapters 6-9</td>
<td>Text</td>
<td>Chapter and unit checkups</td>
</tr>
<tr>
<td>Name the five kingdoms of life and give an example of each.</td>
<td>Classify a selection of plants and animals</td>
<td>Pond water</td>
<td>Teacher-made tests</td>
</tr>
<tr>
<td>Name five important fields in biology.</td>
<td>Study Kingdoms handout for similarities among groups and 5 Kingdoms chart</td>
<td>Microscope and slides</td>
<td></td>
</tr>
<tr>
<td>Give three examples of how an organism adapts to its environment.</td>
<td>Examine articulated skeleton, disarticulated vertebrae</td>
<td>Student handout &quot;Kingdoms&quot;</td>
<td></td>
</tr>
<tr>
<td>Identify the main characteristics of the various animal classes.</td>
<td>&quot;Things to Do,&quot; Chapters 6, 8, and 9</td>
<td>5 Kingdoms chart</td>
<td></td>
</tr>
<tr>
<td>Identify major characteristics of plant phyla.</td>
<td>&quot;Try This&quot; #10-11</td>
<td>Optional: WPS video, Vol. 22, Issue 3, &quot;Fungi&quot;</td>
<td></td>
</tr>
<tr>
<td>Identify major characteristics of protists.</td>
<td>View premade slides</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discuss unit r. view</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
</tr>
<tr>
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</tr>
<tr>
<td>List characteristics common to all animals.</td>
<td>See activities in unit, &quot;Kingdoms of Life&quot;</td>
<td>Text</td>
<td>Chapter and unit checkup</td>
</tr>
<tr>
<td>Define an invertebrate and give three examples.</td>
<td></td>
<td>Microscope and slides</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Define vertebrate and give three examples.</td>
<td></td>
<td>5 Kingdoms chart and handout</td>
<td></td>
</tr>
<tr>
<td>Describe what makes an animal a mammal.</td>
<td></td>
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</tr>
</tbody>
</table>
Course Competency: (08.00) Discuss the importance of plants. (09.00) Identify the parts of plants, differences, and what the plant structures do. (10.00) Describe the importance of chlorophyll and photosynthesis, the purpose and function.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
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</thead>
<tbody>
<tr>
<td>Describe the appearance and function of plant roots, stems, leaves, flowers, seeds, and fruits.</td>
<td>&quot;Try This&quot; #13, 14, 16, 18, 19, and 21</td>
<td>Text</td>
<td>Chapter and unit tests</td>
</tr>
<tr>
<td>Explain the process of photosynthesis.</td>
<td>&quot;Try This&quot; #15, 17, 20, 22, 23, 24-28 are optional depending on time and availability of supplies</td>
<td>Seeds</td>
<td>Teacher-made tests</td>
</tr>
<tr>
<td>Give an example of the interdependence of plants and animals.</td>
<td>Examine various plant materials</td>
<td>Seedlings</td>
<td></td>
</tr>
<tr>
<td>Identify the reproductive parts of a flower.</td>
<td>View video</td>
<td>Plant materials</td>
<td></td>
</tr>
<tr>
<td>Discuss the importance of plants.</td>
<td>Read and discuss text, Chapters 10-15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Resources (Ref., Instructional Aids):

- Text
- Seeds
- Seedlings
- Plant materials

Evaluation Devices:

- Chapter and unit tests
- Teacher-made tests

Optional:

Course Competency: (11.00) Identify and/or describe the structures and functions of the various organ systems. (12.00) Describe the importance of genes and traits and how they are passed on to future generations.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Describe how traits are passed from one generation to the next.</td>
<td>Discuss unit review</td>
<td>Text</td>
<td>Computer worksheets (optional)</td>
</tr>
<tr>
<td>Define genes and chromosomes.</td>
<td>Read and discuss text, Chapters 26-29</td>
<td>Optional: Computer program</td>
<td>Teacher-made test</td>
</tr>
<tr>
<td>Name several traits of a plant or animal and determine if these traits are caused by the environment or by genetics.</td>
<td>&quot;Try This&quot; #39</td>
<td>&quot;Biology: Genetic Engineering&quot; and &quot;Biology: Crop Genetics Yields Better Harvest&quot;</td>
<td></td>
</tr>
<tr>
<td>Identify the reproductive structures and their functions.</td>
<td>Examine models of male and female pelvis</td>
<td>Nova video &quot;The Miracle of Life&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>View Nova video &quot;The Miracle of Life&quot;</td>
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<td></td>
</tr>
</tbody>
</table>
Unit No: 7  
Unit Title: How Life Evolves

Course Competency: (12.00) Describe the importance of genes and traits and how they are passed on to future generations.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Define the theory of natural selection and give an example of its effect.</td>
<td>Read and discuss Chapters 26-29</td>
<td>Text</td>
<td>Teacher criteria for completed paper</td>
</tr>
<tr>
<td>Share information on an extinct species of plant or animal.</td>
<td>Research paper on teacher-selected topics</td>
<td>Library resources</td>
<td></td>
</tr>
</tbody>
</table>
## Unit No: 8

### Unit Title:
The Human Body: Cells, Tissues, Organs, and Systems

### Course Competency:

### Performance Objective(s) and Tasks |
| Identify two kinds of tissue. |
| Name the five senses. |
| Name two body organs. |
| Describe three important body systems and their functions. |
| List and describe the structures of the nervous system. |

### Activities |
| Identify two kinds of tissue. |
| Name the five senses. |
| Name two body organs. |
| Describe three important body systems and their functions. |
| List and describe the structures of the nervous system. |

### Resources (Ref., Instructional Aids) |
| Text |
| Models |
| Video: "The Incredible Machine" |
| "Try This" #29 |
| Examine models of the brain, neuron, and spinal cord |

### Evaluation Devices |
| Chapter and unit checkups |
| Teacher-made tests |
| Microscope and slides |

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### Course Number and Title:

ESL Life Science

### Instructor(s):

B. Dickinson, E. Dell, and G. Hurd
<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the path and organs of the circulatory system.</td>
<td>View slides of human blood</td>
<td>Text</td>
<td>Chapter and unit checkups</td>
</tr>
<tr>
<td></td>
<td>Models of heart, blood vessel chart</td>
<td>Microscope and slides</td>
<td>Teacher-made tests</td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #30, 33, 34, and 35</td>
<td>Models</td>
<td></td>
</tr>
<tr>
<td>Describe the path and organs of the digestive system.</td>
<td>Read and discuss text</td>
<td>Diaphragm jar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #32</td>
<td>Optional: WPS video, Vol. 22, Issue 1, &quot;Human Blood&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Try This&quot; #36, 37, and 38</td>
<td></td>
<td></td>
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<tr>
<td>Describe the path and organs of the respiratory system.</td>
<td>Examine &quot;Muscle Man&quot; model</td>
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<tr>
<td></td>
<td>Skeleton</td>
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<tr>
<td></td>
<td>Skull</td>
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<tr>
<td></td>
<td>Knee model</td>
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<tr>
<td>List glands and the hormones they make and what they do.</td>
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</tr>
<tr>
<td>List and describe the structures of the skeleton and muscles and their purposes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Objective(s) and Tasks</td>
<td>Activities</td>
<td>Resources (Ref., Instructional Aids)</td>
<td>Evaluation Devices</td>
</tr>
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</tr>
<tr>
<td>Explain what a disease is.</td>
<td>Read and discuss text, Chapters 30-32</td>
<td>Text</td>
<td>Chapter and unit checkups</td>
</tr>
<tr>
<td>Name four effective ways to help your body stay healthy.</td>
<td>&quot;Try This&quot; #41</td>
<td>Optional: WPS video, Vol. 26, Issue 3, &quot;Biology: Immunology How the Body Defends Itself&quot;</td>
<td>Optional teacher-made tests</td>
</tr>
<tr>
<td>Explain how cigarettes, drugs, and alcohol harm the body.</td>
<td>&quot;Things to Do,&quot; Chapter 31</td>
<td>Food package labels</td>
<td>Teacher evaluation</td>
</tr>
<tr>
<td>Research project on teacher-selected topics: oral presentations</td>
<td>Students bring in media articles and discuss</td>
<td>Library resources</td>
<td></td>
</tr>
<tr>
<td>Define nutrition.</td>
<td>Discuss unit review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List and discuss seven basic requirements for good physical and mental health.</td>
<td>Optional: Informational talks by doctors, health care center, NTC dental, etc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Unit No:** 11  
**Unit Title:** Interdependence of Living Things  
**Course Competency:** (17.00) Explain the relationship of various communities, populations, and ecosystems.

<table>
<thead>
<tr>
<th>Performance Objective(s) and Tasks</th>
<th>Activities</th>
<th>Resources (Ref., Instructional Aids)</th>
<th>Evaluation Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain what an ecosystem is made up of.</td>
<td>Read and discuss text, Chapters 33-37</td>
<td>Text</td>
<td>Chapter and unit checkups</td>
</tr>
<tr>
<td>List three reasons for conserving natural resources.</td>
<td>Hunting and fishing regulations and reasons</td>
<td>DNR pamphlets</td>
<td>City of Wausau pamphlets</td>
</tr>
<tr>
<td>Define ecology, environment, population, community, ecosystem, biome, biosphere, and describe relationships.</td>
<td>Discuss city of Wausau recycling program, needs and benefits</td>
<td>Optional: WPS video, Vol. 19, Issue 6, &quot;Pharmacology: Medicines From Nature&quot;</td>
<td></td>
</tr>
<tr>
<td>&quot;Try This&quot; #44</td>
<td>Discuss chapter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unit review</td>
<td></td>
<td></td>
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</tbody>
</table>