

COURSE OUTLINE

**Developmental Skills Lab 033
Physical Science IB**

I. Catalog Statement

Developmental Skills Lab 033 expands on basic physical science with concepts of motion, machines, sound, light, electricity and magnetism. This is the second half of a one-year course.

Units — 0.0

Total Laboratory Hours — 100.0

Recommended preparation: ESL 040 or equivalent
DSL 032 or equivalent.

Note: This is a self-paced course in an open-entry, open-exit lab environment. Successful completion of this course results in 5 high school credits (1/2 unit).

II. Course Entry Expectations

Skills Level Ranges: Reading: 5; Writing: 5; Speaking/Listening: 4; Math: 2.

III. Course Exit Standards

Upon successful completion of the required coursework, the student will be able to:

1. state laws of motion and use in calculations for speed, distance and time;
2. identify simple machines and levers and use in calculations for work;
3. describe properties of heat and how it affects matter;
4. explain how sound is produced, travels and is reflected;
5. state the nature of light and its reflection and refraction;
6. summarize electric current in a circuit and the effect of conductors and insulators;
7. compare series and parallel circuits;
8. analyze the causes and uses of magnetic fields and electromagnetism.

IV. Course Content

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|----|---|----------|
| A. | Motion | 20 hours |
| | 1. Motion and speed | |
| | a. elapsed time | |
| | b. calculating distance | |
| | 2. Using a graph to describe motion | |
| | a. predicting distances | |
| | b. velocity | |
| | c. varying speed | |
| | 3. Acceleration and deceleration | |
| | 4. The three laws of motion | |
| | 5. Gravity | |
| | a. law of universal gravitation | |
| | b. gravity and acceleration | |
| B. | Work and Machines | 20 hours |
| | 1. Work defined and measurement | |
| | 2. Energy defined | |
| | a. kinetic and potential energy | |
| | b. law of conservation of energy | |
| | 3. Using of levers | |
| | a. three classes of levers | |
| | b. work and efficiency for a lever | |
| | 4. Mechanical advantage | |
| | 5. Other simple machines | |
| | a. pulley | |
| | b. inclined plane | |
| | c. screw | |
| | d. wheel and axle | |
| C. | Heat | 15 hours |
| | 1. Definition and sources | |
| | 2. How heat affects matter | |
| | a. changing from a liquid to a gas | |
| | b. expanding and contracting matter | |
| | 3. Temperature | |
| | a. thermometers and temperature scales | |
| | b. freezing, melting and boiling points | |
| | 4. Measuring heat | |
| | 5. How heat travels | |
| | a. radiation | |
| | b. conduction | |
| | c. convection | |
| D. | Sound and Light | 20 hours |
| | 1. How sound is produced | |

2. How sounds differ
 - a. light and soft sounds
 - b. high and low sounds
 3. How sound travels
 - a. sound moves through matter
 - b. speed of sound
 - c. how sound bounces
 - d. measuring distances with sound waves
 - e. seeing inside the body with sound
 4. Light defined
 - a. light as a particle and as a wave
 - b. color in white light
 5. Light reflected
 - a. reflection and refraction
 - b. plane, concave and convex mirrors
 6. How light is bent
- E. Electricity 15 hours
1. How electricity flows through a conductor
 - a. static electricity
 - b. closed and open circuits
 2. Conductors, insulators and resistance
 3. Some sources of electric current
 - a. dry and wet cell batteries
 - b. direct and indirect currents
 4. Ohm's law
 5. Series circuits
 - a. batteries in series circuits
 - b. fuses and circuit breakers
 6. Parallel circuits
 7. Measuring electricity
- F. Magnets and Electromagnetism 10 hours
1. Magnets and magnetic poles
 2. Magnetic fields
 3. Causes of magnetism
 4. Relation between magnetism and electricity
 5. Motors

V. **Methods of Presentation**

The following instructional methodologies may be used in the course:

1. independent study using worksheets and texts;
2. computer-aided instruction;
3. small group instruction;
4. video instruction.

VI. Assignments and Methods of Evaluation

1. Student must complete and entire individualized contract.
2. Students complete the work assigned within study guides.
3. Unit exams.

VII. Textbook(s)

Marshall, R. and Jacobs. AGS Physical Science, 2001.
Circle Pines: American Guidance Service, Inc.
10th Grade Textbook Reading Level. ISBN: 0-7854-2271-4

VIII. Student Learning Outcome

- state the laws of motion and use the formulas for speed, distance and time;
- identify simple machines and levers;
- describe properties of heat and measurement;
- state the characteristics of light and sound;
- list the basic elements of electricity, how currents work, summarize electric current in a circuit and the effect of conductors and insulators;
- compare series and parallel circuits;