

# Science

In science, children make discoveries about their environment and themselves. Through the use of the scientific method in hands-on activities and other classroom work, they learn to investigate, make hypotheses, test ideas, and draw conclusions.

Because science deals with phenomena and objects that are part of a child's daily life, it is a subject that engenders enthusiasm in the student. By building on a curiosity about the world and how it works, science classes can help students make wiser decisions in the areas of personal health and social issues as well as develop skills in gathering, categorizing, quantifying, and interpreting information. A good science program from kindergarten through eighth grade will also help students make realistic and informed decisions about careers in science and technology.

In a Catholic school, students of science will also learn that, as individuals created by God, they must take responsibility for their actions and must protect their immediate environment, the planet Earth, and that part of space affected by mankind.

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## PROGRAM GOAL I: TOOLS OF SCIENCE

### PROGRAM OBJECTIVES

- A. Develops proper attitudes toward science
- B. Develops skills used in gathering information
- C. Develops skills used in organizing, understanding and applying information and concepts
- D. Develops skills used in analyzing, synthesizing, and evaluating information and concepts

### SKILL LEVELS:

I-Introduce

D-Develop

M-Master/Maintain

7\* = Life Science

8\* = Earth, Space, Physical

|   | GRADE LEVEL |   |   |   |   |   |   |    |    |
|---|-------------|---|---|---|---|---|---|----|----|
|   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| <b>A. ATTITUDES</b>   |             |   |   |   |   |   |   |    |    |
| A1. Respects and values all forms and stages of life                              | I           | D | D | D | D | D | D | D  | D  |
| A2. Exhibits wonder at God's creation   | I           | D | D | D | D | D | D | D  | D  |
| A3. Values natural resources  | I           | I | D | D | D | D | D | D  | D  |
| A4. Exhibits concern about global problems: hunger, disease, pollution and energy | I           | I | D | D | D | D | D | D  | D  |
| A5. Views science as inquiry, process, and change                                 | I           | I | D | D | D | D | D | D  | D  |
| A6. Acquires information concerning science related careers                       | I           | I | D | D | D | D | D | D  | D  |
|   |             |   |   |   |   |   |   |    |    |
| <b>B. INFORMATION GATHERING SKILLS</b>  |             |   |   |   |   |   |   |    |    |
| B1. Observes objects and phenomena.   | I           | I | D | D | D | D | D | D  | D  |
| B2. Names and counts objects  | I           | D | D | M | M |   |   |    |    |
| B3. Uses metric system  |             | I | I | D | D | D | D | D  | D  |
| B4. Measures the size, mass, and volume of objects                                | I           | I | D | D | D | D | D | D  | D  |
| B5. Collects specimens  | I           | I | D | D | D | D | D | D  | D  |
| B6. Classifies objects  | I           | I | D | D | D | D | M | M  | M  |
| B7. Records data  | I           | I | I | I | D | D | D | M  | M  |

| SUBJECT OBJECTIVES: |  | GRADE LEVEL |   |     |     |     |   |   |    |    |  |
|---------------------|--|-------------|---|-----|-----|-----|---|---|----|----|--|
|                     |  | K           | 1 | 2   | 3   | 4   | 5 | 6 | 7* | 8* |  |
| B8.                 | Reports data graphically   | I           | I | I/D | D   | D   | D | D | D  | D  |  |
| B9.                 | Recognizes and uses proper vocabulary  | I           | I | D   | D   | D   | D | D | D  | D  |  |
| B10.                | Organizes information through note taking and outlining                          |             |   |     |     | I   | D | D | D  | D  |  |
| B11.                | Uses common materials appropriately for laboratory experiments or demonstrations | I           | I | D   | D   | D   | D | D | D  | D  |  |
| B12.                | Uses ocular equipment properly and accurately                                    |             |   | I   | I   | D   | D | D | D  | D  |  |
| B13.                | Uses dissecting tools properly and accurately                                    |             |   |     |     |     |   | I | D  | D  |  |
|                     |  |             |   |     |     |     |   |   |    |    |  |
| C.                  | UNDERSTANDING AND APPLICATION OF SKILLS  |             |   |     |     |     |   |   |    |    |  |
| C1.                 | Identifies, describes, and classifies the properties of objects and phenomena    | I           | I | D   | D   | D   | D | D | D  | D  |  |
| C2.                 | Compares and contrasts objects and phenomena                                     | I           | I | D   | D   | D   | D | D | D  | D  |  |
| C3.                 | Sequences objects and events   | I           | I | D   | D   | D   | D | D | D  | D  |  |
| C4.                 | Estimates results  | I           | I | I/D | D   | D   | D | D | D  | D  |  |
| C5.                 | Predicts outcomes  | I           | I | D   | D   | D   | D | D | D  | D  |  |
| C6.                 | Recognizes cause-and-effect relationships  | I           | I | D   | D   | D   | D | D | D  | D  |  |
| C7.                 | Recognizes space-and-time relationships  | I           | I | I/D | D   | D   | D | D | D  | D  |  |
| C8.                 | Writes lab reports   |             |   | I   | I/D | D   | D | D | D  | D  |  |
|                     |  |             |   |     |     |     |   |   |    |    |  |
| D.                  | USING THE SCIENTIFIC METHOD  |             |   |     |     |     |   |   |    |    |  |
| D1.                 | Makes inferences   |             | I | I   | D   | D   | D | D | D  | D  |  |
| D2.                 | Forms hypotheses   | I           | I | I   | D   | D   | D | M | M  | M  |  |
| D3.                 | Determines procedures  |             |   | I   | I   | D   | D | D | D  | D  |  |
| D4.                 | Follows procedures   | I           | I | D   | D   | D   | D | D | M  | M  |  |
| D5.                 | Controls variables   |             |   |     | I   | I/D | D | D | D  | D  |  |

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|---------------------|--|-------------|---|-----|---|-----|---|---|----|----|--|
|                     |  | K           | 1 | 2   | 3 | 4   | 5 | 6 | 7* | 8* |  |
| D6.                 | Interprets data, graphs, tables, etc..   | I           | I | I/D | D | D   | D | D | D  | M  |  |
| D7.                 | Draws conclusions                        | I           | I | D   | D | D   | D | D | D  | D  |  |
| D8.                 | Makes deductions                         |             |   |     |   | I   | D | D | D  | D  |  |
| D9.                 | Makes generalizations from obtained data |             |   |     |   | I   | D | D | D  | D  |  |
| D10.                | Makes applications                       |             |   |     | I | I/D | D | D | D  | D  |  |
| D11.                | Forms models                             |             |   |     |   |     | I | D | D  | D  |  |
| D12.                | Proposes theories                        |             |   |     |   |     |   | I | D  | D  |  |

**PROGRAM GOAL II: EARTH/SPACE SCIENCE**

**PROGRAM OBJECTIVES:**

- A. Astronomy
- B. Meteorology
- C. Geology
- D. Oceanography

**SKILL LEVELS:**

- I-Introduce
- D-Develop
- M-Master/Maintain

7\* = Life Science  
8\* - Earth, Space, Physical

| SUBJECT OBJECTIVES: |  | GRADE LEVEL |   |     |   |     |   |   |    |    |
|---------------------|--|-------------|---|-----|---|-----|---|---|----|----|
|                     |  | K           | 1 | 2   | 3 | 4   | 5 | 6 | 7* | 8* |
| A.                  | ASTRONOMY  |             |   |     |   |     |   |   |    |    |
| A1.                 | Defines astronomy as the study of solid and gaseous bodies in space and their interrelationships |             |   |     | I | D   | D | M | M  | M  |
| A2.                 | Relates astronomical discoveries and concepts generated in various ancient civilizations         |             |   |     | I | I/D | D | D | D  | D  |
| A3.                 | Knows the contributions of famous and current astronomers  |             |   |     | I | D   | D | D | D  | D  |
| A4.                 | Identifies various theories about the origins of the universe                                    |             |   |     |   |     | I | I | I  | I  |
| A5.                 | Realizes that the study of astronomy is continuing and changing                                  |             |   |     | I | D   | D | D | D  | D  |
| A6.                 | Defines Galaxy   |             |   |     |   |     | I | D | D  |    |
| A7.                 | Identifies the types of galaxies   |             |   |     |   |     | I | D | D  |    |
| A8.                 | Knows that our solar system is located in the Milky Way galaxy                                   |             |   |     |   | I   | I | D | D  | D  |
| A9.                 | Knows that galactic systems are held together by gravity   |             |   |     |   |     | I | D | D  | D  |
| A10.                | Defines the phenomenon known as "black holes"  |             |   |     |   |     | I | D | D  |    |
| A11.                | Defines constellations   | I           | I | I/D | D | D   | D | D | M  | M  |
| A12.                | Identifies and locates selected constellations   |             | I | I/D | D | D   | D | D | M  | M  |
| A13.                | Knows that some constellations were named for mythological figures                               |             |   |     | I | I   | D | D | D  | D  |

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|---------------------|---|-------------|---|---|-----|-----|-----|---|----|-----|
|                     |   | K           | 1 | 2 | 3   | 4   | 5   | 6 | 7* | 8*  |
| A14.                | Defines nebulae   |             |   |   |     |     |     | I | D  | D   |
| A15.                | Defines Light Year  |             |   |   |     |     |     | I | D  | D   |
| A16.                | Knows how to locate the north star (Polaris) by using the Big Dipper  |             | I | I | D   | D   | D   | D | D  | D   |
| A17.                | Lists and locates significant stars   |             |   |   | I   | I   | D   | D | D  | D   |
| A18.                | Lists causes of twinkling of stars  |             |   |   |     |     |     | I | D  | D   |
| A19.                | Knows that the sun is an average star in size, mass, and temperature  |             |   | I | I   | I/D | D   | D | M  | M   |
| A20.                | Knows the range of stellar temperatures   |             |   |   |     |     | I   | I | I  | I/D |
| A21.                | Identifies various theories concerning the origin of the solar system   |             |   |   |     |     | I   | I | D  | D   |
| A22.                | Knows the sun is in constant motion   |             |   |   |     | I   | I/D | D | D  | D   |
| A23.                | Knows ways of casting shadows   | I           | I | D | D   | M   | M   | M | M  | M   |
| A24.                | Knows the relationship between the position of a shadow and the position of the sun   |             | I | I | D   | D   | D   | M | M  | M   |
| A25.                | Demonstrates the relative positions of the earth, moon, and sun during a solar eclipse  |             |   |   | I   | D   | D   | D | D  | D   |
| A26.                | Knows the ways in which the movements and tilt of the earth (in relationship to the sun) affect the seasons; length of day, night, and year; temperatures and climate, etc. |             |   | I | I/D | D   | D   | D | D  | D   |
| A27.                | Demonstrates that the sun can be used to determine direction and the time of day  |             |   | I | D   | D   | D   | M | M  | M   |
| A28.                | Defines equinox   |             |   |   |     |     |     | I | I  | I   |
| A29.                | Defines sunspots  |             |   |   |     |     | I   | I | I  | I   |
| A30.                | Knows effects of solar flares on the earth  |             |   |   |     | I   | I   | D | D  | D   |
| A31.                | Lists various methods of capturing the sun=s energy for use on earth  |             |   | I | I   | I/D | D   | D | D  | D   |
| A32.                | Knows that nuclear reactions (fusion) within the sun are the sun=s primary energy source  |             |   |   |     |     | I   | I | I  | I   |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |     |   |     |   |   |    |    |
|--------------------|--|-------------|---|-----|---|-----|---|---|----|----|
|                    |  | K           | 1 | 2   | 3 | 4   | 5 | 6 | 7* | 8* |
| A33.               | Knows that the earth revolves and rotates simultaneously   |             |   | I   | D | D   | M | M | M  | M  |
| A34.               | Names the seasons of the year  | I           | D | D   | M | M   |   |   |    |    |
| A35.               | List the characteristics of the seasons of the year  | I           | D | D   | M | M   |   |   |    |    |
| A36.               | Knows Keppler's Three Laws regarding orbits of the planets around the sun  |             |   |     |   |     |   | I | I  | I  |
| A37.               | Lists the characteristics of the Van Allen Belts   |             |   |     |   |     |   | I | I  | I  |
| A38.               | Distinguishes between the geographic and magnetic poles of the earth   |             |   |     |   |     | I | I | D  | D  |
| A39.               | Uses a compass to find direction   |             |   |     | I | D   | D | D | D  | D  |
| A40.               | Lists the names of the planets in the solar system   | I           | I | D   | D | D   | D | M | M  | M  |
| A41.               | Lists the main characteristics of the planets in the solar system (i.e. length of day and year, composition of atmosphere, size, number of moons, distance from sun, etc.) |             |   |     |   | I   | D | D | D  | D  |
| A42.               | Defines astronomical unit (a.u.)   |             |   |     |   |     |   | I | I  | I  |
| A43.               | Knows that the moon is the earth's only natural satellite  | I           | I | D   | D | M   | M | M | M  | M  |
| A44.               | Describes the physical features of the moon  | I           | I | I/D | D | D   | D | D | D  | D  |
| A45.               | Names the phases of the moon   | I           |   | I/D | D | D   | D | D | D  | D  |
| A46.               | Demonstrates the relative positions of the earth, moon and sun during phases of the moon   |             |   |     | I | I/D | D | D | D  | D  |
| A47.               | Describes phenomena which illustrate the moon's gravitational interaction with the earth (i.e. moon's orbit, earth's tides, etc.)  |             |   |     | I | D   | D | D | D  | D  |
| A48.               | Knows current developments in the technology of manned and unmanned satellites   |             |   |     | I | D   | D | D | D  | D  |
| A49.               | Defines the terms apogee and perigee   |             |   |     |   |     |   | I | I  | I  |
| A50.               | Describes the conditions that affect manned space flight (temperature, weightlessness, radiation, food and water, etc.)  |             |   |     | I | I/D | D | D | D  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| A51.               | Knows the historical development of the space program in the United States  |             |   |   |   |   |   | I | I  | I  |
| A52.               | Describes the main characteristics of other natural objects in the solar system (comets, meteoroids, asteroids, etc.)   |             |   |   |   | I | D | D | D  | D  |
| A53.               | States the difference between meteor and meteorite  |             |   |   |   |   | I | D | D  | D  |
| A54.               | Knows the relationship between meteors and comets   |             |   |   |   |   | I | D | D  | D  |
| A55.               | Describes the main characteristics and uses of instruments used by astronomers  |             |   |   |   |   | I | D | D  | D  |
| B.                 | METEOROLOGY   |             |   |   |   |   |   |   |    |    |
| B1.                | Defines Meteorology   |             |   |   |   |   | I | D | D  | D  |
| B2.                | Knows the historic and current contributions to the development of meteorological science and technology  |             |   |   |   |   | I | I | D  | D  |
| B3.                | Defines atmosphere  |             |   |   |   | I | D | D | D  | D  |
| B4.                | Demonstrates that air is matter   |             |   | I | I | I | D | M | M  | M  |
| B5.                | Defines air pressure  |             |   |   |   | I | D | D | D  | D  |
| B6.                | Demonstrates how to measure air pressure  |             |   |   |   | I | D | D | D  | D  |
| B7.                | Describes the differences in air pressure brought about by changes in altitude or moisture content of the air   |             |   |   |   | I | D | D | D  | D  |
| B8.                | Identifies the various gases that comprise the atmosphere   |             |   |   |   | I | D | D | D  | D  |
| B9.                | Describes the main characteristics of the various layers and temperature zones of the atmosphere  |             |   |   |   |   |   | I | I  | I  |
| B10.               | Describes the causes of different optical effects resulting from light passing through the atmosphere (i.e. blue sky, rainbows, mirages, halos around the moon, etc.) |             |   |   |   |   |   | I | I  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |     |     |     |   |    |     |  |
|--------------------|---|-------------|---|---|-----|-----|-----|---|----|-----|--|
|                    |   | K           | 1 | 2 | 3   | 4   | 5   | 6 | 7* | 8*  |  |
| B11.               | Describes the "Greenhouse Effect"   |             |   |   |     | I   | D   | D | D  | D   |  |
| B12.               | Knows that warm air rises and cold air sinks  |             |   |   | I   | I   | D   | M | M  | M   |  |
| B13.               | Describes the causes and effects of temperature inversions  |             |   |   |     |     |     | I | I  | I   |  |
| B14.               | Knows that land and water absorb and retain heat at different rates                                   |             |   |   |     | I   | I/D | D | D  | D   |  |
| B15.               | Defines radiation, conduction, and convection in terms of heat energy transfer                        |             |   |   |     | I   | D   | D | D  | D   |  |
| B16.               | Defines of moisture present in the air  |             |   |   |     | I   | D   | D | D  | D   |  |
| B17.               | Describes the effect that temperatures and pressure have on the amount of moisture present in the air |             |   |   |     | I   | D   | D | D  | D   |  |
| B18.               | Demonstrates how to measure relative humidity and the dew point                                       |             |   |   |     |     | I   | D | D  | D   |  |
| B19.               | Describes the progression of the water cycle  |             |   |   |     | I   | D   | D | D  | M M |  |
| B20.               | Describes how clouds are formed   |             |   | I | D   | D   | D   | D | D  | D   |  |
| B21.               | Names the different types of clouds   |             |   |   | I   | I/D | D   | D | D  | D   |  |
| B22.               | Lists the main characteristics of the various cloud types   |             |   |   |     | I   | D   | D | D  | D   |  |
| B23.               | Defines fog   |             |   | I | D   | M   | M   | M | M  | M   |  |
| B24.               | Defines dew and frost   |             |   |   | I/D | D   | M   | M | M  | M   |  |
| B25.               | Describes the conditions needed to produce fog, dew, and frost  |             |   |   |     | I   | D   | D | D  | D   |  |
| B26.               | Lists the main types of precipitation   | I           | I | D | D   | D   | M   | M | M  | M   |  |
| B27.               | Describes the main characteristics of the various types of precipitation                              | I           | I | D | D   | D   | D   | M | M  | M   |  |
| B28.               | Defines air masses  |             |   |   |     |     | I   | D | D  | D   |  |
| B29.               | Names the major air masses  |             |   |   |     |     | I/D | D | D  | D   |  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |     |     |   |    |    |  |
|--------------------|--|-------------|---|---|---|-----|-----|---|----|----|--|
|                    |  | K           | 1 | 2 | 3 | 4   | 5   | 6 | 7* | 8* |  |
| B30.               | Lists the main characteristics of the major air masses (i.e. temperature, humidity, etc.)                      |             |   |   |   |     | I/D | D | D  | D  |  |
| B31.               | Lists the major characteristics and causes of hurricanes, cyclones, tornadoes, and thunderstorms               |             |   |   | I | D   | D   | D | D  |    |  |
| B32.               | Describes safety precautions to take in various storm situations   | I           | I | D | D | D   | D   | D | D  |    |  |
| B33.               | Defines lightning and thunder  |             | I | D | D | D   | M   | M | M  |    |  |
| B34.               | Describes the causes of lightning and thunder  |             |   |   | I | D   | D   | D | D  |    |  |
| B35.               | Defines winds  |             |   | I | I | I/D | D   | D | D  |    |  |
| B36.               | Describes winds in relation to "high" and "low" pressure areas   |             |   |   | I | I/D | D   | D | D  |    |  |
| B37.               | Understands how low and high pressure affects weather  |             |   |   | I | I/D | D   | D | D  |    |  |
| B38.               | Describes land breezes and sea breezes   |             |   |   | I | I/D | D   | D | D  |    |  |
| B39.               | Describes how the rotation of the earth affects winds  |             |   |   |   | I   | I   | D | D  |    |  |
| B40.               | Defines "Coriolis Effect"  |             |   |   |   |     | I   | I | I  |    |  |
| B41.               | Knows the direction of air flow in the northern hemisphere within a high pressure area and a low pressure area |             |   |   |   |     | I   | D | D  |    |  |
| B42.               | Lists the various devices used to measure wind speed and direction   |             |   |   |   | I   | I   | D | D  |    |  |
| B43.               | Demonstrates how to measure wind speed and direction   |             |   |   |   | I   | I   | D | D  |    |  |
| B44.               | Defines windward and leeward   |             |   |   |   |     | I   | I | I  |    |  |
| B45.               | Describes the jet stream and its effect on the weather   |             |   |   |   |     | I   | D | D  |    |  |

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|--------------------|---|-------------|---|---|-----|-----|-----|---|----|----|--|
|                    |   | K           | 1 | 2 | 3   | 4   | 5   | 6 | 7* | 8* |  |
| B47.               | Distinguishes between weather and climate   |             |   |   | I   | I/D | D   | D | D  | D  |  |
| B48.               | Lists the characteristics of the various climate conditions on the earth  |             |   |   | I   | I   | D   | D | D  | D  |  |
| B49.               | Demonstrates how to record daily weather conditions at specified times  | I           | I | I | I   | D   | D   | D | D  | D  |  |
| B50.               | Demonstrates how to use a weather map   |             |   |   |     | I   | D   | D | D  | D  |  |
| B51.               | Describes the function and use of the major weather measurement instruments   |             |   |   |     |     | I   | D | D  | D  |  |
| C.                 | <b>GEOLOGY</b>  |             |   |   |     |     |     |   |    |    |  |
| C1.                | Defines geology as the science of the earth, its processes, its forms, and its relationships to other physical sciences     |             |   |   | I   | D   | D   | M | M  | M  |  |
| C2.                | Knows some of the contributions of historic and current geologists  |             |   |   |     | I   | I/D | D | D  | D  |  |
| C3.                | Lists significant data related to the earth=s size and shape  |             |   |   |     | I   | D   | M | M  | M  |  |
| C4.                | Describes the main characteristics of the earth=s layers  |             |   |   | I   | I   | D   | D | M  | M  |  |
| C5.                | Interprets diagrams representing the earth=s interior structure   |             |   |   |     | I   | D   | D | D  | D  |  |
| C6.                | Distinguishes the properties of the earth=s crust from the properties of the other layers                                   |             |   |   |     | I   | D   | D | D  | D  |  |
| C7.                | Defines terms relating to gross surface features (i.e. continent, land mass, ocean, sea, etc.)                              |             | I | I | I/D | D   | D   | M | M  | M  |  |
| C8.                | Knows the approximate proportion of land to water on the earth's surface  |             | I | I | I/D | D   | D   | M | M  | M  |  |
| C9.                | Identifies various kinds of land and water formations (i.e. hills, mountains, valleys, plains, rivers, bays, islands, etc.) |             | I | I | D   | D   | D   | M | M  | M  |  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| C10.               | Interprets information about the surface of the earth from maps and globes                    |             |   | I | I | D | D | D | D  | D  |
| C11.               | Defines minerals  |             |   |   | I | D | D | D | M  | M  |
| C12.               | Describes characteristics and properties common to minerals                                   |             |   |   | I | D | D | D | D  | D  |
| C13.               | Knows structural characteristics by which minerals are classified and named                   |             |   |   |   | I | I | I | I  | I  |
| C14.               | Uses conventional scientific names for common minerals  |             |   |   |   | I | I | I | I  | I  |
| C15.               | Identifies minerals by testing their chemical and physical properties                         |             |   |   |   |   |   | I | I  | I  |
| C16.               | Defines rocks   |             | I | D | D | D | M | M | M  | M  |
| C17.               | Knows the rock cycle  |             |   |   |   | I | D | D | D  | D  |
| C18.               | Defines igneous, sedimentary, and metamorphic rocks   |             |   |   | I | D | D | D | D  | D  |
| C19.               | Identifies the main characteristics of igneous, sedimentary, and metamorphic rocks            |             |   |   | I | D | D | D | D  | D  |
| C20.               | Describes how igneous, sedimentary, and metamorphic rocks are formed                          |             |   |   |   | I | D | D | D  | D  |
| C21.               | Knows the processes by which fossil fuels such as coal, petroleum, and natural gas are formed |             |   |   | I | I | D | D | D  | D  |
| C22.               | Describes the characteristics of extraterrestrial rocks (i.e. moon rocks, meteorites, etc.)   |             |   |   |   |   | I | D | D  | D  |
| C23.               | Describes the physical properties common to soil  |             |   |   | I | D | D | D | D  | D  |
| C24.               | Knows how soils may be classified   |             |   |   | I | D | D | D | D  | D  |
| C25.               | Distinguishes between topsoil, subsoil, and bedrock   |             |   |   | I | D | D | D | D  | D  |
| C26.               | Describes how to measure the Ph of soil   |             |   |   |   |   |   | I | I  | I  |
| C27.               | Defines vulcanism   |             |   |   |   |   |   | I | I  | I  |
| C28.               | Lists the Characteristics of volcanic materials (i.e. magma, lava, cinders, ash, etc.)        |             |   |   |   | I | D | D | D  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |   |   |
|--------------------|---|-------------|---|---|---|---|---|---|---|---|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| C29.               | Describes the theories related to the causes of vulcanism   |             |   |   |   |   |   | I | I | I |
| C30.               | Defines extrusive and intrusive activity with regard to vulcanism                                       |             |   |   |   |   |   | I | I | I |
| C31.               | Describes the relationship between vulcanism, earthquakes, and mountain building                        |             |   |   |   |   |   | I | I | I |
| C32.               | Defines earthquake  |             |   |   | I | I | I | D | D | D |
| C33.               | Describes the main causes of earthquakes  |             |   |   |   | I | I | I | D | D |
| C34.               | Defines faults  |             |   |   |   | I | I | D | M | M |
| C35.               | Defines epicenter   |             |   |   |   | I | I | I | D | D |
| C36.               | Describes how earthquakes cause tidal waves   |             |   |   |   | I | I | I | D | D |
| C37.               | Describes how seismographs measure and record intensities of earthquakes                                |             |   |   |   | I | I | I | D | D |
| C38.               | Knows that the Richter Scale measures intensities of earthquakes  |             |   |   |   | I | I | I | D | D |
| C39.               | Describes how the study of earthquakes provides information about the structure of the earth=s interior |             |   |   |   | I | I | I | D | D |
| C40.               | Defines continental plates  |             |   |   |   |   |   | I | I | I |
| C41.               | Describes the characteristics of the continental plates   |             |   |   |   |   |   | I | I | I |
| C42.               | Defines Plate Tectonic Theory   |             |   |   |   |   |   | I | I | I |
| C43.               | Defines continental drift   |             |   |   |   |   |   | I | I | I |
| C44.               | Describes how mountains are formed  |             |   |   |   |   |   | I | I | I |
| C45.               | Identifies the characteristics of volcanic and folded mountains   |             |   |   |   |   |   | I | I | I |
| C46.               | Defines terms related to faulting and folding (i.e. fracturing, anticline, syncline, etc.)              |             |   |   |   |   |   | I | I | I |
| C47.               | Defines weathering  |             |   |   | I | D | D | M | M | M |
| C48.               | Identifies the different types of weathering  |             |   |   | I | D | D | D | M | M |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |     |   |    |    |
|--------------------|---|-------------|---|---|---|---|-----|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5   | 6 | 7* | 8* |
| C49.               | Describes the ways in which climatic conditions influence weathering                    |             |   |   | I | D | D   | D | D  | D  |
| C50.               | Defines erosion   |             |   |   | I | D | D   | M | M  | M  |
| C51.               | Describes the causes and effects of erosion   |             |   |   | I | D | D   | D | D  | D  |
| C52.               | Identifies methods used to prevent erosion  |             |   |   | I | D | D   | D | D  | D  |
| C53.               | Describes how material is transported by running water                                  |             |   |   | I | I | D   | D | D  | D  |
| C54.               | Distinguishes a young stream from an old river  |             |   |   |   |   |     | I | I  | I  |
| C55.               | Defines sediment  |             |   |   | I | D | D   | M | M  | M  |
| C56.               | Describes parts of a river (i.e. source, meander, load, bed, mouth, etc.)               |             |   |   |   | I | I   | D | D  | D  |
| C57.               | Describes how running water forms deltas, alluvial fans, oxbows, and waterfalls         |             |   |   | I | I | I   | I | I  | I  |
| C58.               | Defines a watershed   |             |   |   |   |   |     | I | I  | I  |
| C59.               | Describes ways in which running water restructures land forms                           |             |   |   | I | I | I/D | D | D  | D  |
| C60.               | Describes how caves are formed  |             |   |   |   | I | I   | D | D  | D  |
| C61.               | Identifies stalagmites and stalactites  |             |   |   |   |   | I   | D | D  | D  |
| C62.               | Defines water table   |             |   |   | I | I | D   | D | M  | M  |
| C63.               | Describes how glaciers are formed   |             |   |   |   | I | D   | D | D  | D  |
| C64.               | Describes glacial movement  |             |   |   |   |   | I   | D | D  | D  |
| C65.               | Describes the effect of glacial action on the earth=s surface                           |             |   |   | I | I | D   | D | D  | D  |
| C66.               | Identifies land features formed by glacial action (i.e. rills, moraines, cirques, etc.) |             |   |   |   |   |     | I | I  | I  |
| C67.               | Describes how icebergs are formed   |             |   |   |   |   | I   | D | D  | D  |
| C68.               | Identifies the various geologic eras  |             |   |   |   |   | I   | I | I  | I  |
| C69.               | Describes the main characteristics of the various geologic eras                         |             |   |   |   |   | I   | I | I  | I  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|--|-------------|---|---|---|---|---|---|----|----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| C70.               | Describes the development of life on earth during specific time periods  |             |   |   |   |   | I | D | D  | D  |
| C71.               | Describes how fossils were formed  |             |   | I | D | D | D | M | M  | M  |
| C72.               | Describes methods by which fossils can be used to date geologic events   |             |   |   |   |   |   | I | D  | D  |
| C73.               | Describes methods used to extract fossils from rocks   |             |   |   |   |   |   | I | I  | I  |
| C74.               | Identifies current dating methods for geologic events (i.e. carbon-14, etc.)   |             |   |   |   |   |   | I | I  | I  |
| C75.               | Identifies the main tools used by geologists   |             |   |   |   |   |   | I | I  | I  |
|                    |  |             |   |   |   |   |   |   |    |    |
| D.                 | OCEANOGRAPHY   |             |   |   |   |   |   |   |    |    |
| D1.                | Defines oceanography   |             |   |   |   |   | I | I | D  | D  |
| D2.                | Lists the historic and current contributions of oceanographers and institutions to the field of oceanographic research                     |             |   |   |   |   |   | I | I  | I  |
| D3.                | Defines ocean basin  |             |   |   |   |   | I | I | I  | I  |
| D4.                | Identifies topographical features on the ocean floor that are similar to those on land   |             |   |   |   |   | I | I | I  | D  |
| D5.                | Describes the main characteristics of major structures of ocean basins (i.e. rises, abyssal plains, trenches, etc.)                        |             |   |   |   |   |   | I | I  | I  |
| D6.                | Describes the relationships between currents, sediments, and structures of ocean basins  |             |   |   |   |   | I | I | D  | D  |
| D7.                | Describes the main topographic features of continental margins (i.e. shore, continental shelf, continental slope, submarine canyons, etc.) |             |   |   |   |   |   | I | I  | I  |
| D8.                | Describes the common characteristics which distinguish seawater from fresh water   | I           | I | D | D | D | D | D | D  | D  |
| D9.                | Identifies the major layers of ocean water (i.e. bottom water, deep water, etc.)   |             |   |   |   |   | I | I | I  | I  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |     |   |     |   |    |    |  |
|--------------------|---|-------------|---|---|-----|---|-----|---|----|----|--|
|                    |   | K           | 1 | 2 | 3   | 4 | 5   | 6 | 7* | 8* |  |
| D10.               | Defines ocean currents  |             |   |   |     |   | I   | I | I  | D  |  |
| D11.               | Describes the effects of the major ocean currents on the climate and topography of adjacent land masses                       |             |   |   |     |   |     | I | I  | I  |  |
| D12.               | Describes the influence that oceans have on the temperature and climate of the earth  |             |   |   |     |   | I   | I | D  | D  |  |
| D13.               | Identifies the forces which are responsible for tides on the earth  |             |   |   | I   | I | I/D | D | D  | D  |  |
| D14.               | Describes how tides may be used to generate electricity   |             |   |   |     |   | I   | I | I  | I  |  |
| D15.               | Identifies the main causes of ocean waves   |             |   |   |     | I | I   | I | D  | D  |  |
| D16.               | Describes the factors which affect wave height and speed  |             |   |   |     |   | I   | I | D  | D  |  |
| D17.               | Defines Tsunami   |             |   |   |     | I | I   | D | D  | D  |  |
| D18.               | Identifies the structural characteristics of islands, reefs, deltas, swamps, estuaries, and tide flats                        |             |   |   |     |   | I   | I | D  | D  |  |
| D19.               | Identifies shoreline forms caused by erosion (i.e. cliffs, etc.) And deposition (i.e. bays, lagoons, etc.)                    |             |   |   |     |   | I   | I | D  | D  |  |
| D20.               | Defines estuary   |             |   |   |     |   |     | I | I  | I  |  |
| D21.               | Lists and describes the main characteristics of the four types of estuaries   |             |   |   |     |   |     | I | I  | I  |  |
| D22.               | Describes the importance of estuaries to marine and shore life  |             |   |   |     |   |     | I | I  | I  |  |
| D23.               | Defines bays and lagoons  |             |   |   |     |   |     | I | I  | I  |  |
| D24.               | Identifies ways in which humans have affected the oceans (i.e. fishing, off-shore drilling, dredging, building jetties, etc.) |             |   | I | I   | I | D   | D | D  | D  |  |
| D25.               | Identifies various types of ocean pollution (i.e. oil spills, etc.)   |             |   | I | I   | I | I/D | D | D  | D  |  |
| D26.               | Describes the effect of pollution on marine life  | I           | I | I | I/D | D | D   | D | D  | M  |  |

**PROGRAM GOAL III: LIFE SCIENCE**

**PROGRAM OBJECTIVES:**

Develops an understanding of:

- A. The Cell
- B. The organism
- C. Populations of organisms
- D. Natural systems
- E. Human influence on natural systems

**SKILL LEVELS:**

- I-Introduce
- D-Develop
- M-Master/Maintain

7\* = Life Science  
8\* = Earth, Space, Physical

| SUBJECT OBJECTIVES: |  | GRADE LEVEL |   |   |   |   |   |     |    |    |
|---------------------|--|-------------|---|---|---|---|---|-----|----|----|
|                     |  | K           | 1 | 2 | 3 | 4 | 5 | 6   | 7* | 8* |
| A.                  | THE CELL   |             |   |   |   |   |   |     |    |    |
| A1.                 | Defines cells as the basic units of living structures  |             |   |   | I | D | D | D   | M  | M  |
| A2.                 | Distinguishes between unicellular and multicellular organisms                                |             |   |   | I | I | D | D   | M  | M  |
| A3.                 | Recognizes that most multicellular organisms are organized into tissues, organs, and systems |             |   |   |   | I | D | D   | M  | M  |
| A4.                 | Identifies the parts of a generalized plant or animal cell                                   |             |   |   |   |   | I | D   | M  | M  |
| A5.                 | Knows the parts of a microscope and uses them correctly                                      |             |   |   |   |   | I | D   | D  | D  |
| A6.                 | Prepares materials for microscopic use   |             |   |   |   |   |   | I   | I  | I  |
| A7.                 | Recognizes the main parts of a cell from microscopic inspection                              |             |   |   |   |   |   | I   | I  | I  |
| A8.                 | Differentiates between the concepts of structure and function                                |             |   |   |   |   | I | I/D | D  | D  |
| A9.                 | Describes the functions of cell parts  |             |   |   |   |   | I | I/D | D  | D  |
| A10.                | Defines cellular death   |             |   |   |   |   | I | I/D | D  | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |     |   |   |   |     |   |  |
|--------------------|--|-------------|---|---|-----|---|---|---|-----|---|--|
|                    |  | K           | 1 | 2 | 3   | 4 | 5 | 6 | 7   | 8 |  |
| A11.               | Identifies the materials which cells require to maintain life  |             |   |   |     |   | I | I | D   | D |  |
| A12.               | Identifies the processes that are required for living cells to acquire materials necessary to maintain life (i.e. diffusion and osmosis) |             |   |   |     |   |   | I | D   | D |  |
| A13.               | Understands the interdependence of living things and their environment   | I           | I | I | I/D | D | D | D | M   | M |  |
| A14.               | Describes the materials needed for photosynthesis and lists its products   |             |   |   |     | I | D | D | D   | D |  |
| A15.               | Relates photosynthesis to both a respiratory process and a food process  |             |   |   |     |   | I | I | D   | D |  |
| A16.               | Describes the processes by which animal and plant cells acquire and use energy   |             |   |   |     |   | I | I | D   | D |  |
| A17.               | Knows that cells respond to external stimuli   |             |   |   |     |   |   | I | I/D | D |  |
| A18.               | Defines DNA, gene, and trait   |             |   |   |     |   |   | I | I/D | D |  |
| A19.               | Knows that the "blueprint" of an organism is passed from cell to cell by duplication of DNA, followed by mitosis                         |             |   |   |     |   |   | I | I/D | D |  |
| A20.               | Defines mitosis and meiosis  |             |   |   |     |   |   | I | I/D | D |  |
| A21.               | Identifies the stages of meiosis and mitosis   |             |   |   |     |   |   | I | I   | I |  |
| A22.               | Predicts single trait expression in off-spring using Mendel=s laws   |             |   |   |     |   |   | I | I/D | D |  |
| A23.               | Defines mutation   |             |   |   |     |   |   | I | I/D | D |  |
| A24.               | Explains the genetic basis for determination of sex in an individual   |             |   |   |     |   |   | I | I/D | D |  |
| A25.               | Describes the difference between asexual and sexual reproduction   |             |   |   |     |   |   | I | D   | D |  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| B.                 | THE ORGANISM  |             |   |   |   |   |   |   |    |    |
| B1.                | Defines organism  |             |   |   | I | D | D | D | M  | M  |
| B2.                | Lists the characteristic functions that distinguishes living from nonliving matter  | I           | I | D | D | D | M | M | M  | M  |
| B3.                | Defines classification and knows that in all classification schemes, things are grouped together on the basis of common characteristics | I           | I | D | D | D | D | D | M  | M  |
| B4.                | Groups organisms on the basis of observed similarities and differences in one characteristic  | I           | I | D | D | D | D | D | D  | D  |
| B5.                | Knows that the major categories in a taxonomy of organisms are called kingdoms  |             |   |   |   |   | I | D | D  | D  |
| B6.                | Knows that kingdoms are subdivided into phyla, classes, orders, families, genera, species, and varieties                                |             |   |   |   |   |   | I | I  | I  |
| B7.                | Knows that an organism=s scientific name consists of two Latin words which identify its exact place in the taxonomy of organisms        |             |   |   |   |   |   | I | I  | I  |
| B8.                | Knows that structural characteristics of organisms may vary in shape, color, size, composition, location in the organism, etc.          | I           | I | D | D | D | D | D | M  | M  |
| B9.                | Identifies the external and internal structures of an organism which enables it to live, move, and obtain food in its environment       |             | I | D | D | D | D | D | M  | M  |
| B10.               | Uses ocular equipment to examine structures of organisms  | I           | I | D | D | D | D | D | D  | D  |
| B11.               | Identifies specific organisms through observation of their structures   |             | I | D | D | D | D | D | D  | D  |
| B12.               | Knows that parts of organisms may have several functions  |             | I | D | D | D | D | D | D  | D  |
| B13.               | Defines adaptation and lists ways in which various organisms can adapt for survival   |             | I | D | D | D | D | D | D  | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |     |   |    |    |
|--------------------|--|-------------|---|---|---|---|-----|---|----|----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5   | 6 | 7* | 8* |
| B14.               | Knows that "behavior" refers to the manner in which organisms respond to stimuli   |             | I | D | D | D | D   | D | M  | M  |
| B15.               | Lists ways in which various organisms perceive their environment (i.e. smell, sound, sight, etc.)                          | I           | I | D | D | D | D   | D | M  | M  |
| B16.               | Defines micro-organism   |             |   |   |   | I | I/D | D | M  | M  |
| B17.               | Identifies the natural habitats of various micro-organisms   |             |   |   |   | I | I/D | D | D  | D  |
| B18.               | Grows cultures of micro-organisms  |             |   |   |   | I | I   | I | D  | D  |
| B19.               | Identifies and contrasts viruses, bacteria, and protozoa   |             |   |   |   |   |     | I | D  | D  |
| B20.               | Identifies and contrasts algae, fungi, molds, and lichens  |             |   |   | I | I | I   | D | D  | D  |
| B21.               | Identifies and contrasts mosses, liverworts, and ferns   |             |   |   | I | I | I   | I | D  | D  |
| B22.               | Identifies the major parts of a seed and describes their function  | I           | I | I | I | D | D   | D | D  | D  |
| B23.               | Identifies and contrasts gymnosperms and angiosperms   |             |   |   |   |   |     |   | I  | D  |
| B24.               | Identifies and contrasts monocots and dicots   |             |   |   | I | I | D   | D | D  | D  |
| B25.               | Identifies the parts of common plants (i.e. leaves, roots, stems)  | I           | I | I | D | D | D   | D | M  | M  |
| B26.               | Defines pollination and knows the ways in which pollen is carried to the stigma for pollination (i.e. wind, insects, etc.) |             |   | I | I | D | D   | D | M  | M  |
| B27.               | Grows plants from seeds and observes, measures, and records plant growth   | I           | I | D | D | D | M   | M | M  | M  |
| B28.               | Tests the effects of moisture, temperature, oxygen, and light on seed germination and growth                               |             |   |   | I | I | D   | D | D  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |     |   |    |    |
|--------------------|---|-------------|---|---|---|---|-----|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5   | 6 | 7* | 8* |
| B29.               | Identifies the parts of a flower and describes their functions                                |             | I | I | D | D | D   | D | M  | M  |
| B30.               | Identifies the structure and function of the vascular systems in plants                       |             |   |   | I | I | I/D | D | M  | M  |
| B31.               | Classifies seeds, flowers, fruits, or cones by structural similarities and differences        |             | I | I | I | I | I   | I | D  | D  |
| B32.               | Defines invertebrates   |             |   |   | I | I | I   | D | D  | D  |
| B33.               | Identifies the characteristics of sponges and soft-bodied animals (porifera and coelenterata) |             |   |   | I | I | I   | D | D  | D  |
| B34.               | Identifies the characteristics of the types of worms (playhelminthes, nematoda, annelida)     |             |   |   | I | I | I   | D | D  | D  |
| B35.               | Identifies the characteristics of mollusks  |             |   | I | I | I | I   | D | D  | D  |
| B36.               | Identifies the characteristics of echinoderms   |             |   |   | I | I | I   | D | D  | D  |
| B37.               | Identifies the characteristics of arthropods  | I           | I | I | I | I | I/D | D | D  | D  |
| B38.               | Identifies the characteristics of the classes of arthropods (i.e. insecta, crustacea, etc.)   |             |   |   |   |   | I   | D | D  | D  |
| B39.               | Describes the larva, pupa, and adult stages of those organisms which undergo metamorphosis    |             |   |   | I | I | D   | D | D  | D  |
| B40.               | Defines vertebrates   |             |   |   | I | I | I/D | D | D  | D  |
| B41.               | Distinguishes between invertebrates and vertebrates   |             |   |   |   |   | I   | D | D  | D  |
| B42.               | Identifies the characteristics of a fish  | I           | I | I | D | D | D   | D | D  | D  |
| B43.               | Identifies the characteristics of amphibians  | I           | I | I | D | D | D   | D | D  | D  |
| B44.               | Identifies the characteristics of reptiles  | I           | I | I | D | D | D   | D | D  | D  |
| B45.               | Identifies the characteristics of birds   | I           | I | D | D | D | D   | D | D  | D  |
| B46.               | Identifies the characteristics of mammals   | I           | I | D | D | D | D   | D | D  | D  |
| B47.               | Defines instinct and contrasts instinct with learned behavior                                 |             |   |   |   | I | D   | D | D  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |     |    |
|--------------------|---|-------------|---|---|---|---|---|---|-----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7*  | 8* |
| B48.               | Describes some of the ways in which animals communicate   | I           | I | D | D | D | D | D | D   | D  |
| B49.               | Knows that most offspring look similar to their parents   | I           | I | D | M | M |   |   |     |    |
| B50.               | Matches young animals with the appropriate parent   | I           | I | D | M | M |   |   |     |    |
| B51.               | Identifies ways in which animals take care of their young   | I           | I | D | D | D | D | D | M   | M  |
| B52.               | Lists the advantages some animals gain from organizing social groups  |             |   |   | I | D | D | D | D   | D  |
| B53.               | Distinguishes between plant reproduction and animal reproduction  |             |   |   |   | I | D | D | M   | M  |
| B54.               | Defines sperm, egg, fertilization, zygote, embryo, and fetus  |             |   |   |   |   |   | I | D   | D  |
| B55.               | Knows that in sexual reproduction the union of gametes is usually necessary to restore normal gene complement and to produce viable offspring |             |   |   |   |   |   | I | I/D | D  |
| B56.               | Identifies the stages of embryonic development in selected organisms  |             |   |   |   |   |   | I | ID  | D  |
| B57.               | Knows that each organism has its own process of growth and development  | I           | I | D | D | D | D | D | D   | D  |
| B58.               | Describes the major structural and functional changes produced by sexual maturation   |             |   |   |   |   |   | I | D   | D  |
| B59.               | Describes the functions of DNA, RNA, chromosomes, and genes in humans   |             |   |   |   |   |   | I | I/D | D  |
| B60.               | Defines genetic dominance and recessiveness and identifies common traits in humans which are dominant and recessive                           |             |   |   |   |   |   | I | I/D | D  |
| B61.               | Analyzes a family tree (pedigree) in terms of several genetic traits  |             |   |   |   |   |   | I | I   | I  |
| B62.               | Recognizes specific structural and functional differences in specialized cells (i.e. nerve, muscle, etc.)                                     |             |   |   |   | I | D | D | D   | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |    |   |
|--------------------|--|-------------|---|---|---|---|---|---|----|----|---|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |   |
| B63.               | Describes the main functions of the skeletal system  | I           | I | I | I | D | D | D | D  | D  |   |
| B64.               | Name the parts of a bone   |             |   |   | I | D | D | D | D  | D  |   |
| B65.               | Differentiates between bone and cartilage  |             |   |   | I | D | D | D | D  | D  |   |
| B66.               | Identifies the various types of joints   |             |   |   | I | D | D | D | D  | D  |   |
| B67.               | Differentiates between tendons and ligaments   |             |   |   | I | D | D | D | D  | D  |   |
| B68.               | Describes the main function of the muscle system   | I           | I | I | I | D | D | D | D  | D  |   |
| B69.               | Contrasts voluntary, involuntary, and cardiac muscles  |             |   |   | I | D | D | D | D  | D  |   |
| B70.               | Describes the major parts of the digestive system and knows their functions                        | I           | I | I | I | D | D | D | D  | D  |   |
| B71.               | Describes the main functions of the circulatory system   | I           | I | I | I | D | D | D | D  | D  |   |
| B72.               | Names the major parts of the circulatory system including blood                                    |             |   |   | I | D | D | D | D  | D  |   |
| B73.               | Identifies the parts of the heart.   |             |   |   | I | D | D | D | D  | D  |   |
| B74.               | Traces the flow of the blood through the circulatory system  |             |   |   |   | I | D | D | D  | D  |   |
| B75.               | Names the major parts of the respiratory system and knows their functions                          | I           | I | I | I | D | D | D | D  | D  |   |
| B76.               | Names the major parts of the excretory system and knows their functions                            |             |   |   |   |   | I | D | D  | D  |   |
| B77.               | Names the major parts of the nervous system and knows their functions                              |             |   |   |   | I | D | D | D  | D  |   |
| B78.               | Distinguishes between voluntary and involuntary responses  |             |   |   |   | I | D | D | D  | D  |   |
| B79.               | Names the major parts of the reproductive systems, both male and female, and knows their functions |             |   |   |   |   |   | I | I  | D  | D |
| B80.               | Describes the structure and function of each of the five special sensory organs                    | I           | I | D | D | D | D | D | M  | M  |   |

| SUBJECT OBJECTIVES         |  | GRADE LEVEL |   |   |   |   |   |     |     |    |
|----------------------------|--|-------------|---|---|---|---|---|-----|-----|----|
|                            |  | K           | 1 | 2 | 3 | 4 | 5 | 6   | 7*  | 8* |
| B81.                       | Differentiates between exocrine (duct) and endocrine (ductless) glands   |             |   |   |   |   |   | I   | D   | D  |
| B82.                       | Names the major endocrine glands and knows their function  |             |   |   |   |   | I | I   | I/D | D  |
| B83.                       | Describes the function of lymphatic system   |             |   |   |   |   | I | I   | I/D | D  |
| C. POPULATION OF ORGANISMS |  |             |   |   |   |   |   |     |     |    |
| C1.                        | Knows that population refers to a group of organisms of the same species living and reproducing in the same area           |             |   | I | D | D | D | D   | M   | M  |
| C2.                        | Identifies the factors which function as internal and external controls on population growth                               |             |   |   |   |   |   | I/D | D   | D  |
| C3.                        | Analyzes problems of uncontrolled population growth including human  |             |   |   |   |   |   | I/D | D   | D  |
| C4.                        | Lists ways in which diseases are spread among plants and animals   |             |   |   |   | I | D | D   | D   | D  |
| C5.                        | Knows that genetic principles that apply to families apply to populations as well  |             |   |   |   |   |   |     | I/D | D  |
| C6.                        | Knows the meanings of terms conventionally used in the study of population genetics (i.e. gene pool, gene frequency, etc.) |             |   |   |   |   |   |     | I   | I  |
| C7.                        | Knows that over time, stable populations adapt genetically to their environments   |             |   |   |   |   |   |     | I   | I  |
| C8.                        | Lists some of the effects of introducing new genes into a gene pool  |             |   |   |   |   |   |     | I   | I  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |     |   |     |    |    |
|--------------------|---|-------------|---|---|---|-----|---|-----|----|----|
|                    |   | K           | 1 | 2 | 3 | 4   | 5 | 6   | 7* | 8* |
| D.                 | NATURAL SYSTEMS   |             |   |   |   |     |   |     |    |    |
| D1.                | Knows that a living thing is a product of its heredity and environment  |             | I | D | D | D   | D | D   | M  | M  |
| D2.                | Knows that environment is the combination of all external factors which affect and influence growth, development, and reproduction of organisms |             |   |   |   | I   | I | I/D | D  | D  |
| D3.                | Defines terms used conventionally in the study of natural environments (i.e. habitat, climate, location, region, biome, community, etc.)        |             |   |   | I | D   | D | D   | M  | M  |
| D4.                | Constructs a model environment (i.e. aquarium, terrarium, etc.)   |             | I | D | D | D   | D | D   | D  | D  |
| D5.                | Identifies factors which cause changes in natural or model environments   |             |   |   |   | I   | D | D   | D  | D  |
| D6.                | Identifies ways in which natural environments meet the basic needs of organisms living in them  |             |   |   | I | D   | D | D   | D  | D  |
| D7.                | Knows how seasonal and weather changes affect living organisms  | I           | I | D | D | D   | M | M   | M  | M  |
| D8.                | Identifies materials used by animals to construct homes in various biomes or habitats   | I           | I | D | D | D   | M | M   | M  | M  |
| D9.                | Defines terms used to describe relationships within a community (i.e. symbiotic, parasitic, competitive, predatory, etc.)                       |             |   |   |   | I   | I | D   | D  | D  |
| D10.               | Describes the relationship between producers and consumers in a community   |             |   | I | I | I/D | D | D   | D  | D  |
| D11.               | Observes and records interactions between organisms in communities found in familiar local settings (i.e. school yard, pond, creek, etc.)       |             |   |   | I | D   | D | D   | D  | D  |
| D12.               | Defines ecology   |             |   |   |   | I   | D | D   | M  | M  |
| D13.               | Defines ecosystem, and explains terms used to describe and analyze ecosystems (i.e. stability, diversity, density, cycles, etc.)                |             |   |   |   |     |   |     | I  | I  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |     |   |    |    |
|--------------------|--|-------------|---|---|---|---|-----|---|----|----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5   | 6 | 7* | 8* |
| D14.               | Identifies closed and open ecosystems  |             |   |   |   |   |     | I | I  | I  |
| D15.               | Describes food chain and food webs and represents both with diagrams   |             |   | I | D | D | D   | D | M  | M  |
| D16.               | Knows the implications of disruptions in food chains or food webs  |             |   | I | D | D | D   | D | M  | M  |
| D17.               | Defines decay as the breakdown of organic material due to digestive action of micro-organisms                              |             |   |   |   | I | D   | D | M  | M  |
| D18.               | Recognizes decay in a model or natural ecosystem   |             |   |   |   | I | D   | D | M  | M  |
| D19.               | Explains the basic cycles of matter operating in successful ecosystems (i.e. water, nitrogen, oxygen-carbon dioxide, etc.) |             |   |   | I | D | D   | D | D  | D  |
| D20.               | Applies the principle of conservation of matter to an ecosystem  |             |   |   |   | I | D   | D | D  | D  |
| D21.               | Describes the major earth biomes (i.e. desert, arctic, freshwater, marine, etc.)   |             |   |   | I | I | I   | D | D  | D  |
| D22.               | Describes the biosphere  |             |   |   |   | I | I/D | D | D  | D  |
| D23.               | Lists the predominant theories concerning the origin of life   |             |   |   |   |   |     | I | I  | I  |
| D24.               | Identifies the factors of evolutionary process which produce changes in a species  |             |   |   |   |   |     | I | I  | I  |
| D25.               | Identifies various prehistoric organisms such as dinosaurs, brachiopods, trilobites  | I           | I | D | D | D | D   | D | D  | D  |
| E.                 | HUMAN INFLUENCE ON NATURAL SYSTEMS   |             |   |   |   |   |     |   |    |    |
| E1.                | Identifies substances which humans consider "air pollutants"   | I           | I | I | D | D | D   | D | M  | M  |
| E2.                | Identifies the factors affecting local and global patterns of dispersal of substances released into the atmosphere         |             |   |   | I | D | D   | D | D  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| E3.                | Defines conservation  | I           | I | D | D | M | M | M | M  | M  |
| E4.                | Defines recycling   | I           | I | D | D | M | M | M | M  | M  |
| E5.                | Identifies the causes, problems, and issues related to air pollution  |             | I | D | D | D | D | D | D  | D  |
| E7.                | Describes the chief methods used to prevent water pollution   |             | I | D | D | D | D | D | D  | D  |
| E8.                | Describes the chief methods used to prevent air pollution   |             | I | D | D | D | D | D | D  | D  |
| E9.                | Identifies human activities that modify soils (i.e. tilling, planting, fertilizing, mining, burying wastes, etc.) And identifies problems and issues related to human use or pollution of soils |             |   |   | I | D | D | D | D  | D  |
| E10.               | Describes techniques developed by farmers to prevent soil erosion, flooding, drought, etc.  |             |   |   | I | D | D | D | D  | D  |
| E11.               | Describes the ways in which irrigation systems affect land use  |             |   |   | I | D | D | D | D  | D  |
| E12.               | Identifies ways in which human alterations of land affect the stability of the ecosystem (i.e. cutting and laying roads, logging mountainsides, etc.)   |             | I | D | D | D | D | D | D  | D  |
| E13.               | Identifies human activities which modify bodies of water (i.e. dam building, waste, disposal, dredging, etc.)   |             |   |   | I | D | D | D | D  | D  |
| E14.               | Identifies human activities which affect ground water, water tables, or drainage systems, etc.  |             |   |   |   | I | D | D | D  | D  |
| E15.               | Identifies problems and issues related to water pollution, water conservation, or allocation of water resources   |             | I | D | D | D | D | D | D  | D  |
| E16.               | Identifies some species which are in danger of extinction, and human activities which may have contributed to this condition  |             |   | I | D | D | D | D | D  | D  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |     |   |   |   |    |    |  |
|--------------------|---|-------------|---|---|-----|---|---|---|----|----|--|
|                    |   | K           | 1 | 2 | 3   | 4 | 5 | 6 | 7* | 8* |  |
| E17.               | Distinguishes between renewable and non-renewable resources   |             |   |   |     | I | I | D | D  | D  |  |
| E18.               | Defines and identifies bio-degradable materials   |             |   |   |     | I | I | I | D  | D  |  |
| E19.               | Identifies problems and issues related to the ecological effects of human resource consumption and waste disposal |             |   |   |     | I | I | I | I  | D  |  |
| E20.               | Identifies problems and issues related to use of nuclear energy   |             |   |   |     |   | I | I | D  | D  |  |
| E21.               | Identifies recyclable materials   | I           | I | I | I/D | D | D | M | M  | M  |  |

**PROGRAM GOAL IV: PHYSICAL SCIENCE**

**PROGRAM OBJECTIVES:**

**SKILL LEVELS**

Develops an understanding of the basic principles of:

I-Introduce  
D-Develop  
M-Master/Maintain

- A. Chemistry
- B. Physics

7\* = Life Science  
8\* = Earth, Space, Physical

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |    |  |
|--------------------|--|-------------|---|---|---|---|---|---|----|----|--|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |  |
| A.                 | CHEMISTRY  |             |   |   |   |   |   |   |    |    |  |
| A1.                | Defines matter   |             | I | D | D | D | M | M | M  | M  |  |
| A2.                | Defines physical change  |             |   |   | I | D | D | D | D  | M  |  |
| A3.                | Defines chemical change  |             |   |   | I | D | D | D | D  | M  |  |
| A4.                | Lists the characteristics of matter involved in a physical change  |             |   |   | I | D | D | D | D  | D  |  |
| A5.                | Lists the characteristics of matter involved in chemical change  |             |   |   | I | D | D | D | D  | D  |  |
| A6.                | Defines atom   |             |   |   | I | I | I | D | D  | M  |  |
| A7.                | Defines proton, electron, and neutron.   |             |   |   |   | I | I | D | D  | D  |  |
| A8.                | Defines atomic number  |             |   |   |   |   | I | I | I  | I  |  |
| A9.                | Defines atomic mass  |             |   |   |   |   |   | I | I  | I  |  |
| A10.               | Knows that a chemical symbol is one or two letters used to represent a particular element  |             |   |   |   |   | I | D | D  | M  |  |
| A11.               | Knows that in the Bohr atomic model, the nucleus of the atom is compared to the sun and the electrons to the planets in the solar system |             |   |   |   |   |   |   |    | I  |  |
| A12.               | Draws a model of the Bohr atom   |             |   |   |   |   |   |   |    | I  |  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |   |   |
|--------------------|--|-------------|---|---|---|---|---|---|---|---|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A13.               | Defines Modern Atomic Theory   |             |   |   |   |   | I | I | I | I |
| A14.               | Defines isotopes   |             |   |   |   |   | I | I | I | I |
| A15.               | Defines ions   |             |   |   |   |   |   | I | I | I |
| A16.               | Defines chemical bond as a force which holds atoms or ions together in a molecule  |             |   |   |   |   | I | I | I | I |
| A17.               | Defines covalent bonding   |             |   |   |   |   |   | I | I | I |
| A18.               | Defines ionic bonding  |             |   |   |   |   |   | I | I | I |
| A19.               | Identifies the elements and the number of atoms of each element represented by the molecular formula of a given molecule |             |   |   |   |   | I | I | I | I |
| A20.               | Explains the importance of polymers  |             |   |   |   |   |   | I | I | I |
| A21.               | Defines elements   |             |   |   | I | I | D | D | D | M |
| A22.               | Defines molecules  |             |   |   | I | I | I | D | D | M |
| A23.               | Distinguishes between an element and a compound  |             |   |   |   |   | I | D | D | M |
| A24.               | Defines Periodic Law   |             |   |   |   |   |   | I | I | I |
| A25.               | Distinguishes between periods and families on the periodic table   |             |   |   |   |   |   | I | I | I |
| A26.               | Knows that all elements may be classified as metals or non-metals  |             |   |   |   |   | I | D | D | D |
| A27.               | Describes the differences between metals and non-metals  |             |   |   |   |   | I | D | D | D |
| A28.               | Identifies the properties of metals and the uses of some important metals  |             |   |   |   |   | I | D | D | D |
| A29.               | Identifies the properties of non-metals and the relationship of the family members                                       |             |   |   |   |   | I | D | D | D |
| A30.               | Lists some uses of non-metallic elements   |             |   |   |   |   | I | D | D | D |
| A31.               | Identifies the properties and uses for the members of the carbon family  |             |   |   |   |   |   | I | D | D |
| A32.               | Knows that matter can be identified by physical and chemical properties  |             |   |   | I | D | D | D | D | D |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|--|-------------|---|---|---|---|---|---|----|----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| A33.               | Recognizes elements by chemical symbol, atomic number, and family                            |             |   |   |   |   | I | I |    | I  |
| A34.               | Identifies reactants and products in a chemical reaction                                     |             |   |   |   |   |   | I |    | I  |
| A35.               | Demonstrates various chemical reactions  |             |   |   | I | D | D | D | D  | D  |
| A36.               | Balances chemical equations  |             |   |   |   |   |   | I |    | I  |
| A37.               | List the four phases of matter   |             |   |   | I | D | M | M |    |    |
| A38.               | Knows that matter exists as a gas, liquid, or solid, depending on the temperature            |             |   | I | D | D | D | D | D  | D  |
| A39.               | Defines the Law of Conservation of Matter and Energy   |             |   |   |   |   |   | I |    | I  |
| A40.               | Identifies Einstein=s Theory: E-mc <sup>2</sup>  |             |   |   |   |   |   |   |    | I  |
| A41.               | Knows that any change in matter involves   |             |   |   |   | I | D | D | D  | D  |
| A42.               | Identifies properties of gasses  |             |   | I | D | D | D | D |    | M  |
| A43.               | Identifies properties of liquid  |             |   | I | D | D | D |   |    | M  |
| A44.               | Identifies properties of solids  |             |   | I | D | D | D | D |    | M  |
| A45.               | Defines evaporation and condensation   |             |   |   | I | D | D | D |    | M  |
| A46.               | Describes boiling and freezing in terms of the average velocity of molecules in a liquid     |             |   |   | I | I | I | I |    | I  |
| A47.               | Demonstrates surface tension   |             |   |   |   |   | I |   |    | D  |
| A48.               | Defines crystal  |             |   |   |   |   | I | D |    | D  |
| A49.               | Knows that under proper conditions, crystals form when the liquid evaporates from a solution |             |   |   |   | I | I | D | D  | D  |
| A50.               | Lists ways of growing crystals   |             |   |   |   | I | I | D | D  | D  |
| A51.               | Grows crystals   |             |   |   |   | I | I | D | D  | D  |
| A52.               | Defines solution   |             |   |   | I | I | D | D | D  | M  |
| A53.               | Defines solute and solvent   |             |   |   |   |   | I | I | D  | D  |
| A54.               | Describes various types of solutions   |             |   |   |   |   |   | I | D  | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |     |   |   |   |   |     |    |   |
|--------------------|--|-------------|---|-----|---|---|---|---|-----|----|---|
|                    |  | K           | 1 | 2   | 3 | 4 | 5 | 6 | 7*  | 8* |   |
| A55.               | Identifies common materials as mixture   |             |   |     | I | D | D | D | D   | D  |   |
| A56.               | Knows that not all materials will dissolve in water  |             |   |     | I | D | D | D | D   | D  |   |
| A57.               | Separates mixtures   |             |   |     | I | D | D | D | D   | D  |   |
| A58.               | Defines acids and bases  |             |   |     |   |   |   | I |     | D  |   |
| A59.               | Lists the main characteristics of acids and bases  |             |   |     |   |   |   | I |     | I  |   |
| A60.               | Lists various indicators of acids and bases (i.e. litmus paper, etc.)                          |             |   |     |   |   |   | I |     | I  |   |
| A61.               | Tests various acids and bases  |             |   |     |   |   |   | I |     | D  |   |
| A62.               | Defines pH   |             |   |     |   |   |   | I |     | I  |   |
| A63.               | Defines neutralization reaction  |             |   |     |   |   |   | I |     | I  |   |
| A64.               | Defines oxidation - reduction  |             |   |     |   |   |   | I |     | I  |   |
| A65.               | Knows that a source of heat is needed to start fuels burning                                   |             | I | I/D | D | M | M | M |     |    |   |
| A66.               | Defines radioactivity  |             |   |     |   |   | I | I |     | D  |   |
| A67.               | Defines half-life  |             |   |     |   |   |   | I |     | I  |   |
| A68.               | Distinguishes nuclear fission and nuclear fusion   |             |   |     |   |   |   | I | I   | I  | D |
| A69.               | Defines organic chemistry  |             |   |     |   |   |   | I | I   | D  |   |
| A70.               | Knows that carbon atoms can be bonded to an extent not possible for atoms of any other element |             |   |     |   |   |   | I | I/D | D  |   |
|                    |  |             |   |     |   |   |   |   |     |    |   |
| B.                 | PHYSICS  |             |   |     |   |   |   |   |     |    |   |
| B1.                | Defines mass   |             |   | I   | I | D | D | M | M   | M  |   |
| B2.                | Measures the mass of various objects   |             |   |     | I | D | D | M | M   | M  |   |
| B3.                | Defines length   | I           | I | I/D | D | M | M | M | M   | M  |   |
| B4.                | Measures length  | I           | I | I/D | D | M | M | M | M   | M  |   |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |     |   |   |     |   |     |     |
|--------------------|---|-------------|---|-----|---|---|-----|---|-----|-----|
|                    |   | K           | 1 | 2   | 3 | 4 | 5   | 6 | 7   | 8   |
| B5.                | Knows the standard units of measurement in both the metric and English units          |             | I | I/D | D | D | D   | D | D   | D   |
| B6.                | Defines time  |             | I | D   | D | M | M   | M | M   | M   |
| B7.                | Measures time   | I           | I | D   | D | M | M   | M | M   | M   |
| B8.                | Defines motion  |             |   | I   | D | M | M   | M | M   | M   |
| B9.                | Knows that motion can be in many directions   | I           | I | I/D | D | M | M   | M | M   | M   |
| B10.               | Identifies the variables which affect moving objects                                  |             | I | I/D | D | D | D   | M | M   | M   |
| B11.               | Defines speed   |             |   |     |   |   | I   | D | M   | M   |
| B12.               | Compares speeds based on personal experience  | I           | I | I   | D | D | D   | M | M   | M   |
| B13.               | Determines the average speed of objects in a physical situation                       |             |   |     |   |   | I   | D | D   | D   |
| B14.               | Defines circular motion   |             |   |     |   |   | I   | I | I/D | I/D |
| B15.               | Defines centripetal force   |             |   |     |   |   | I   | I | I/D | I/D |
| B16.               | Defines force   |             | I | D   | D | M | M   | M | M   | M   |
| B17.               | Predicts the effects of force upon an object  |             | I | D   | D | M | M   | M | M   | M   |
| B18.               | Identifies various types of forces (i.e. frictional, gravitational, electrical, etc.) |             |   |     | I | D | M   | M | M   | M   |
| B19.               | Defines equilibrium   |             |   |     |   | I | I/D | D | D   | M   |
| B20.               | Knows that there can be many forces acting on an object                               |             |   |     | I | D | D   | D | M   | M   |
| B21.               | Define Newton=s Three Laws of Motion  |             |   |     |   |   | I   | I | D   | D   |
| B22.               | Demonstrates each of Newton=s Three Laws of motion                                    |             |   |     |   |   | I   | I | D   | D   |
| B23.               | Defines friction  |             |   | I   | D | M | M   | M | M   | M   |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |     |   |   |   |   |     |     |
|--------------------|--|-------------|---|-----|---|---|---|---|-----|-----|
|                    |  | K           | 1 | 2   | 3 | 4 | 5 | 6 | 7*  | 8*  |
| B24.               | Lists the causes of friction                                     |             |   | I   | D | M | M | M | M   | M   |
| B25.               | Describes ways to increase or decrease the frictional forces     |             |   |     | I | D | D | D | D   | D   |
| B26.               | Defines Newton=s Law of Gravitation                              |             |   |     |   |   |   | I | D   | D   |
| B27.               | Defines gravity  |             | I | D   | D | M | M | M | M   | M   |
| B28.               | Defines weight   | I           | I | I/D | D | M | M | M | M   | M   |
| B29.               | Compares weights of objects by weighing them in his or her hands | I           | I | D   | D | M | M | M | M   | M   |
| B30.               | Compares weights of objects by weighing them on a scale          | I           | I | D   | D | M | M | M | M   | M   |
| B31.               | Defines energy   |             |   | I   | D | D | M | M | M   | M   |
| B32.               | Knows the forms of energy  |             |   |     | I | D | D | D | D   | D   |
| B33.               | Lists examples of energy changing form                           |             |   |     |   |   | I | D | D   | D   |
| B34.               | Identifies common units to measure energy                        |             |   |     |   | I | I | I | D   | D   |
| B35.               | Defines work   |             |   |     | I | D | D | D | M   | M   |
| B36.               | Defines kinetic energy   |             |   |     |   | I | I | I | I/D | I/D |
| B37.               | Identifies various examples of kinetic energy                    |             |   |     |   | I | I | I | I/D | I/D |
| B38.               | Defines potential energy   |             |   |     |   | I | I | I | I   | I   |
| B39.               | Identifies various examples of potential energy                  |             |   |     |   | I | I | I | I   | I   |
| B40.               | Describes the relationship between potential and kinetic energy  |             |   |     |   |   |   | I | D   | D   |
| B41.               | Defines simple machine   |             |   |     | I | D | D | D | M   | M   |
| B42.               | Defines compound machine   |             |   |     | I | D | D | D | M   | M   |
| B43.               | Calculates the mechanical advantage of simple machines           |             |   |     |   |   |   | I | I   | I/D |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |   |     |
|--------------------|--|-------------|---|---|---|---|---|---|---|-----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7 | *8* |
| B44.               | Identifies the six classes of simple machines  |             |   |   | I | D | D | D |   | M   |
| B45.               | Identifies the parts of the various simple machines  |             |   |   | I | D | D | M |   |     |
| B46.               | Identifies the different classes of levers   |             |   |   | I | I | D | D |   | M   |
| B47.               | Gives examples of each type of lever   |             |   |   | I | I | D | D |   | M   |
| B48.               | Compares masses with a balance   |             |   | I | I | I | D | D | D | D   |
| B49.               | Knows the relationship between the masses of objects and their distance from the fulcrum when balancing an equal arm balance |             |   |   | I | I | I | D |   | M   |
| B50.               | Knows that motion which repeats itself is called periodic  |             |   |   |   |   | I | D |   | M   |
| B51.               | Defines period as the time interval for a complete oscillation   |             |   |   |   |   | I | D | D | D   |
| B52.               | Defines frequency as the number of complete vibration or oscillations per unit of time                                       |             |   |   |   |   |   | I | D | D   |
| B53.               | Determines that the period of the swing of a pendulum is dependent on the length of the pendulum                             |             |   |   |   |   | I | D | D | D   |
| B54.               | Defines volume   |             |   | I | I | D | D | D | D | D   |
| B55.               | Measure the volume of various objects  |             |   |   |   | I | D | D | D | D   |
| B56.               | Defines density  |             |   |   |   | I | I | D | D | M   |
| B57.               | Calculates density   |             |   |   |   |   |   | I | I | I   |
| B58.               | Compares densities of various liquids  |             |   |   | I | I | I | I | I | I   |
| B59.               | Demonstrates why some objects float and others sink in water   |             |   | I | D | D | D | D | M | M   |
| B60.               | Defines pressure   |             |   |   |   | I | D | D | M | M   |
| B61.               | Knows the effects of height and depth on pressure  |             |   |   |   | I | D | D | D | M   |
| B62.               | Knows that most materials expand when heated and contract when cooled.   |             |   | I | D | D | D | M | M | M   |
| B63.               | Defines temperature  | I           | I | D | D | D | M | M | M | M   |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |  |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|--|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |  |
| B64.               | Demonstrates ways to measure temperature  | I           | I | D | D | D | M | M |    |    |  |
| B65.               | Defines Fahrenheit, Celsius scales  |             |   |   |   | I | D | D | D  | M  |  |
| B66.               | Identifies the freezing and boiling point of water on Celsius and Fahrenheit scales       |             |   |   |   | I | D | D | D  | D  |  |
| B67.               | Knows the unique expansion and contraction properties of water                            |             |   |   | I | D | D | D | D  | M  |  |
| B68.               | Defines heat  |             |   | I | I | I | I | I | I  | I  |  |
| B69.               | Describes the processes of heat transfer (i.e. conduction, convection, and radiation)     |             |   |   |   | I | D | D | D  | D  |  |
| B70.               | Identifies heat conductors and heat insulators  |             |   |   |   | I | I | D | D  | D  |  |
| B71.               | Knows that dark objects absorb radiant energy and shiny or bright colored objects reflect |             |   | I | I | I | D | D | D  | D  |  |
| B72.               | Defines longitudinal wave   |             |   |   |   |   |   | I | I  | I  |  |
| B73.               | Defines transverse wave   |             |   |   |   |   |   | I | I  | I  |  |
| B74.               | Defines frequency, wavelength and amplitude of a wave                                     |             |   |   | I | I | I | I | D  | D  |  |
| B75.               | Identifies common properties of waves   |             |   |   |   |   |   | I | D  | D  |  |
| B76.               | Defines visible light   |             |   | I | I | I | I | D | D  | D  |  |
| B77.               | Knows that an object is visible because of the light reflected from it                    |             |   | I | I | I | D | M | M  | M  |  |
| B78.               | Defines electromagnetic spectrum  |             |   |   |   |   |   | I | I  | I  |  |
| B79.               | Knows the speed of light  |             |   |   |   |   | I | D | M  | M  |  |
| B80.               | Knows the effect of the density of a medium on the speed of light                         |             |   |   |   |   |   | I | I  | I  |  |
| B81.               | Lists the characteristics of objects which are transparent, translucent and opaque        |             |   | I | I | I | I | D | D  | D  |  |
| B82.               | Knows that light has characteristics of both waves and particles                          |             |   |   |   |   |   | I | I  | I  |  |
| B83.               | Defines shadow  | I           | I | D | D | D | D | M | M  | M  |  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |     |   |   |   |   |    |    |
|--------------------|--|-------------|---|-----|---|---|---|---|----|----|
|                    |  | K           | 1 | 2   | 3 | 4 | 5 | 6 | 7* | 8* |
| B84.               | Defines mirror   | I           | I | D   | D | D | D | D | M  | M  |
| B85.               | Distinguishes between convex and concave lenses                            |             |   |     |   | I | D | D | D  | D  |
| B86.               | Identifies the type of image formed by each type of lens                   |             |   |     |   | I | D | D | D  | D  |
| B87.               | Defines spectrum   |             |   |     | I | I | D | D | M  | M  |
| B88.               | Defines prism  |             |   |     |   | I | D | D | M  | M  |
| B89.               | Knows the frequency determines the color of light                          |             |   |     |   |   |   | I | D  | D  |
| B90.               | Uses a prism to produce colors   |             |   |     | I | I | D | D | D  | D  |
| B91.               | Knows that an object is black because it absorbs all frequencies of light  |             |   |     | I | I | D | D | D  | D  |
| B92.               | Knows that an object is white because it reflects all frequencies of light |             |   |     | I | I | D | D | D  | D  |
| B93.               | Identifies primary colors of pigment                                       | I           | I | D   | M | M | M | M | M  | M  |
| B94.               | Defines complementary colors of pigment                                    |             |   |     |   |   |   | I | I  | I  |
| B95.               | Defines diffraction of light   |             |   |     |   |   |   | I | D  | D  |
| B96.               | Identifies ways in which water distorts images                             |             |   |     |   |   |   | I | I  | I  |
| B97.               | Defines laser  |             |   |     |   |   |   | I | D  | D  |
| B98.               | Identifies various uses of lasers  |             |   |     |   |   |   | I | D  | D  |
| B99.               | Defines sound  |             | I | I/D | D | M | M | M | M  | M  |
| B100.              | Knows that sound waves are longitudinal waves                              |             |   |     |   |   |   | I | I  | I  |
| B101.              | Produces sound by causing objects to vibrate                               | I           | I | I/D | D | M | M |   |    |    |
| B102.              | Identifies the properties of sound perceived by humans                     |             |   |     | I | D | D | D | D  | D  |
| B103.              | Defines ultrasonic and subsonic  |             |   |     |   |   |   | I | D  | D  |
| B104.              | Identifies the comparative properties of materials to transmit sound       |             |   |     |   | I | D | D | D  | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |     |
|--------------------|--|-------------|---|---|---|---|---|---|----|-----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8*  |
| B105.              | Defines a vacuum   |             |   |   |   |   |   | I | I  | I   |
| B106.              | Knows that the speed of sound is related to the properties of the medium through which it passes |             |   |   |   |   | I | D | D  | D   |
| B107.              | Knows that sound can be reflected and absorbed   |             |   |   | I | D | D | D | D  | D   |
| B108.              | Identifies materials which reflect and absorb sound  |             |   | I | I | D | D | D | D  | D   |
| B109.              | Defines decibels   |             |   |   |   |   |   | I | I  | I   |
| B110.              | Distinguishes between loudness and pitch   |             |   | I | D | D | D | D | D  | D   |
| B111.              | Defines Doppler Effect   |             |   |   |   |   |   | I | I  | I/D |
| B112.              | Describes how radar and sonar work   |             |   |   |   |   |   | I | I  | I   |
| B113.              | Defines resonance  |             |   |   |   |   |   | I | I  | I   |
| B114.              | Demonstrates resonance   |             |   |   |   |   |   | I | I  | I   |
| B115.              | Produces sound by vibrating a string   | I           | I | D | M | M | M | M |    |     |
| B116.              | Changes the pitch by changing the tension on the string  | I           | I | D | M | M | M |   |    |     |
| B117.              | Defines electricity  |             |   |   | I | D | D | D | D  | D   |
| B118.              | Describes ways in which electrical energy is converted to other forms of energy                  |             |   |   |   | I | D | D | D  | D   |
| B119.              | Knows that like charges repel and unlike charges attract   |             |   |   |   | I | D | D | D  | D   |
| B120.              | Distinguishes between conductors and insulators  |             |   |   |   | I | D | D | D  | D   |
| B121.              | Distinguishes static and current electricity   |             |   |   |   | I | D | D | D  | D   |
| B122.              | Lists examples of static electricity in the environment  |             |   |   |   | I | D | D | D  | D   |
| B123.              | Identifies the units of electrical measurement   |             |   |   |   |   | I | I | I  | I   |
| B124.              | Defines ground   |             |   |   |   |   | I | D | D  | D   |
| B125.              | Describes how current electricity moves through a conductor                                      |             |   |   |   | I | D | D | D  | D   |
| B126.              | Defines resistance   |             |   |   |   | I | D | D | D  | D   |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |     |   |   |   |     |     |     |  |
|--------------------|--|-------------|---|-----|---|---|---|-----|-----|-----|--|
|                    |  | K           | 1 | 2   | 3 | 4 | 5 | 6   | 7*  | 8*  |  |
| B127.              | Identifies the different processes used to produce electricity                 |             |   |     |   | I | D | D   | D   | D   |  |
| B128.              | Defines electrical circuit   |             |   |     |   | I | D | D   | D   | D   |  |
| B129.              | Distinguishes between an open and a closed circuit                             |             |   |     |   | I | D | D   | D   | D   |  |
| B130.              | Identifies parallel circuit and series circuit                                 |             |   |     |   | I | D | D   | D   | D   |  |
| B131.              | Constructs a series circuit and a parallel circuit                             |             |   |     |   | I | D | D   | D   | D   |  |
| B132.              | Lists the causes of a short circuit.   |             |   |     |   | I | D | D   | D   | D   |  |
| B133.              | Knows that electrical energy is purchased in units of kilowatt hours           |             |   |     |   |   | I | I/D | I/D | I/D |  |
| B134.              | Defines magnetism  | I           | I | I/D | D | D | M | M   | M   | M   |  |
| B135.              | Distinguishes between magnetic and non-magnetic objects                        | I           | I | I/D | D | D | M | M   | M   | M   |  |
| B136.              | Identifies natural magnets   |             |   |     | I | I | D | D   | D   | D   |  |
| B137.              | Lists the ways to identify permanent and temporary magnets                     |             |   |     |   |   | I | D   | D   | D   |  |
| B138.              | Lists the conditions under which magnets will attract or repel other magnets   |             | I | D   | D | M | M | M   | M   | M   |  |
| B139.              | Knows that magnets have magnetic fields around them                            |             |   | I   | D | D | D | M   | M   | M   |  |
| B140.              | Knows that there is a magnetic field around an electrical current.             |             |   |     |   | I | D | D   | D   | D   |  |
| B141.              | Knows that moving a wire through a magnetic field produces an electric current |             |   |     |   | I | D | D   | D   | D   |  |
| B142.              | Knows what causes a magnet to demagnetize                                      |             |   |     |   | I | D | M   | M   | M   |  |
| B143.              | Constructs an electromagnet  |             |   |     |   | I | D | D   | D   | D   |  |
| B144.              | Defines generator  |             |   |     |   | I | I | I   | I   | I   |  |

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |  |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|--|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |  |
| B145.              | Knows the means by which a generator produces alternating current |             |   |   |   | I | I | I | I  | I  |  |
| B146.              | Distinguishes between A.C. and D.C.                               |             |   |   |   |   | I | D | D  | D  |  |
| B147.              | Identifies the parts of an electric motor                         |             |   |   |   |   |   | I | I  | I  |  |

**PROGRAM GOAL V: SCIENCE and TECHNOLOGY**

**PROGRAM OBJECTIVES:**

- A. Abilities of technological design
- B. Understanding technology
- C. Abilities to distinguish between natural objects and objects

**SKILL LEVELS:**

- I-Introduce
- D-Develop
- M-Master/Maintain

| SUBJECT OBJECTIVES |   | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|---|-------------|---|---|---|---|---|---|----|----|
|                    |   | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| A.                 | <b>ABILITIES OF TECHNOLOGICAL DESIGN</b>  |             |   |   |   |   |   |   |    |    |
| A1.                | Explore that each kind of tool has an intended use, which can be helpful or harmful.                  | I           | D | D | M |   |   |   |    |    |
| A2.                | Investigate that tools are used to help make things and some things cannot be made without tools.     |             | I | D | M |   |   |   |    |    |
| A3.                | Explore that several steps are usually needed to make things.   |             | I | D | D | M | M |   |    |    |
| A4.                | Investigate that when parts are put together they can do things that they could not do by themselves. |             | I | D | D | D | D | M | M  | M  |
| A5.                | Communicate orally, pictorially, or in written form the design process used to make something.        |             |   | I | D | D | D | D | D  | D  |
| A6.                | Use a simple design process to solve a problem.   |             |   |   | I | D | D | D | D  | M  |
| A7.                | Describe possible solutions to a design problem.  |             |   |   | I | D | D | D | D  | D  |
| A8.                | Describe, illustrate and evaluate the design process used to solve a problem.                         |             |   |   |   | I | D | D | D  | D  |
| A9.                | Revise an existing design used to solve a problem based on peer review.                               |             |   |   |   |   | I | D | D  | D  |
| A10.               | Explain how the solution to one problem may create other problems.                                    |             |   |   |   |   | I | D | D  | D  |
| A11.               | Design and build a product or create a solution to a problem given one constraint.                    |             |   |   |   |   |   | I | D  | D  |
| A12.               | Design and build a product or create a solution to a problem given two constraints.                   |             |   |   |   |   |   | I | I  | D  |
| A13.               | Design and build a product or create a solution to problem given more than two constraints.           |             |   |   |   |   |   | I | I  | D  |
| A14.               | Evaluate the overall effectiveness of a product design or solution.                                   |             |   |   |   |   |   | I | I  | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|--|-------------|---|---|---|---|---|---|----|----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| B.                 | UNDERSTANDING TECHNOLOGY   |             |   |   |   |   |   |   |    |    |
| B1.                | Explain that when trying to build something or get something to work better, it helps to follow directions and ask someone who has done it before. | I           | D | M | M |   |   |   |    |    |
| B2.                | Explore ways people use energy to cook their food and warm their homes.  |             | I | D | M |   |   |   |    |    |
| B3.                | Identify how people can save energy by turning things off when they are not using them.  |             | I | D | D | M |   |   |    |    |
| B4.                | Explain that developing and using technology involves benefits and risks.  |             |   | I | D | D | M |   |    |    |
| B5.                | Investigate why people make new products or invent new ways to meet their individual wants and needs.  |             |   | I | D | D | M |   |    |    |
| B6.                | Predict how building or trying something new might effect other people and the environment.  |             |   | I | D | D | M |   |    |    |
| B7.                | Describe how technology can extend human abilities.  |             |   |   | I | D | D | D | D  | M  |
| B8.                | Describe ways that using technology can have helpful and/or harmful results.   |             |   |   | I | D | D | D | D  | M  |
| B9.                | Investigate ways that the results of technology may affect the individual, family and community.   |             |   |   | I | D | D | D | D  | D  |
| B10.               | Explain how technology from different areas has improved human lives.  |             |   |   |   | I | D | D | D  | D  |
| B11.               | Investigate how technology and inventions change to meet peoples' needs and wants.   |             |   |   |   | I | D | D | D  | D  |
| B12.               | Investigate positive and negative impacts of human activity and technology on the environment.   |             |   |   |   |   | I | D | D  | D  |
| B13.               | Explain how technology influences the quality of life.   |             |   |   |   |   |   | I | D  | D  |
| B14.               | Explain how decisions about the use of products and systems can result in desirable or undesirable consequences.                                   |             |   |   |   |   |   | I | D  | D  |
| B15.               | Describe how automation has changed manufacturing including manual labor being replaced by highly-skilled jobs.                                    |             |   |   |   |   |   | I | D  | D  |

| SUBJECT OBJECTIVES |  | GRADE LEVEL |   |   |   |   |   |   |    |    |
|--------------------|--|-------------|---|---|---|---|---|---|----|----|
|                    |  | K           | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8* |
| B16.               | Explain how the usefulness of manufactured parts of an object depend on how well their properties allow them to fit and interact with other materials. |             |   |   |   |   |   | I | D  | D  |
| B17.               | Explain how needs, attitudes and values influence the direction of technological development in various cultures.                                      |             |   |   |   |   |   | I | D  | D  |
| B18.               | Describe how decisions to develop and use technologies often put environmental and economic concerns in direct competition with each other.            |             |   |   |   |   |   | I | D  | D  |
| B19.               | Recognize that science can only answer some questions and technology can only solve some human problems.   |             |   |   |   |   |   | I | D  | D  |
| B20.               | Examine how science and technology have advanced through the contributions of many different people, cultures and times in history.                    |             |   |   |   |   |   | I | D  | D  |
| B21.               | Examine how choices regarding the use of technology are influenced by constraints caused by various unavoidable factors.                               |             |   |   |   |   |   | I | D  | D  |
| C.                 | ABILITIES TO DISTINGUISH BETWEEN NATURAL OBJECTS AND OBJECTS MADE BY HUMANS  |             |   |   |   |   |   |   |    |    |
| C1.                | Explore the objects that can be sorted as "natural" or "man-made".   | I           | D | D | M |   |   |   |    |    |
| C2.                | Explore that some materials can be used over and over again.   | I           | D | D | M | M |   |   |    |    |
| C3.                | Explore that some kinds of materials are better suited than others for making something new.   |             | I | D | D | M | M |   |    |    |
| C4.                | Identify some materials that can be saved for community recycling projects.  |             | I | D | D | M | M |   |    |    |