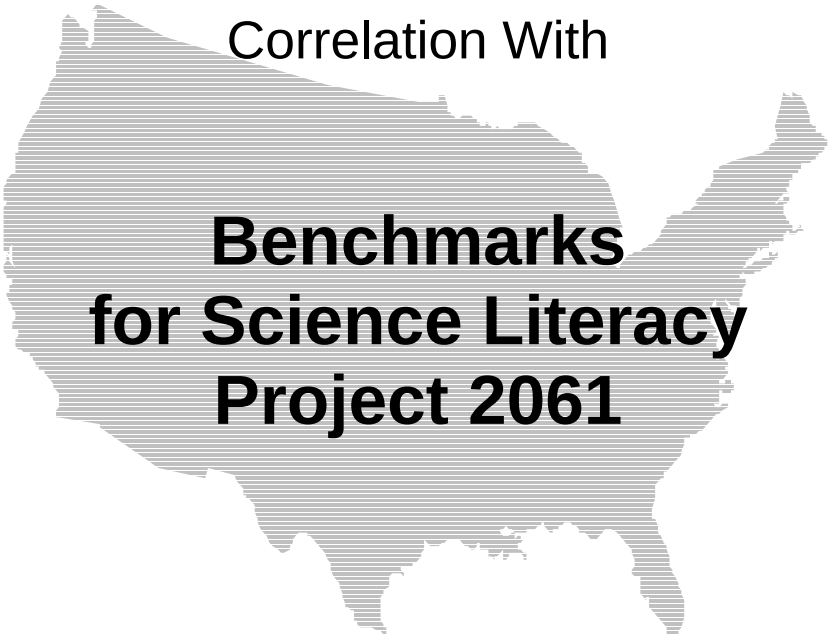
DSM II™

Delta Science Modules
(DSM II)
Grades K-8

Correlation With



Benchmarks for Science Literacy Project 2061

Delta Education
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BENCHMARKS FOR SCIENCE LITERACY

PROJECT 2061

Benchmarks for Grades K-8

The Nature of Science

The Physical Setting

The Living Environment

The Human Organism

Common Themes

K-2 Benchmarks ~ The Nature of Science

<u>NOTE</u>: DSM II modules are inquiry-based. The fundamentals of scientific inquiry are embedded in all modules. Examples of activities for each benchmark are listed.

BENCHMARK	*DSM II*
When a science investigation is done the way it was done before, we expect to get very similar results.	**Sunshine and Shadows** Activity 6 Reinforcement **Properties** Activity 6 **Investigating Water** Activity 10 Reinforcement **Soil Science** Activity 3, 5
Science investigations generally work the same way in different places.	**Investigating Water** Activity 7 Science and Health **Sunshine and Shadows** Activity 6 Science and Health **States of Matter** Activity 8 Reinforcement
People can often learn about things around them by just observing those things carefully, but sometimes they can learn more by doing something to the things and noting what happens.	**From Seed to Plant** Activity 2-7 **Investigating Water** Activity 1-11 **States of Matter** Activity 1-7 **Amazing Air** Activity 1-7
Tools such as thermometers, magnifiers, rulers, or balances often give more information about things than can be obtained by just observing things without their help.	**Properties** Activity 6 **From Seed to Plant** Activity 1-6 **Length and Capacity** Activity 5-7 **Weather Watching** Activity 2, 3
Describing things as accurately as possible is important in science because it enables people to compare their observations with those of others.	**Finding the Moon** Activity 3-5 **Observing and Aquarium** Activity 3-6, 8-10 **Plant and Animal Populations** Activity 1-3 **Butterflies and Moths** Activity 1, 2, 5, 6, 8-12
When people give different descriptions of the same thing, it is usually a good idea to make some fresh observations instead of just arguing about who is right.	**Properties** Activity 7 **Using Your Senses** Activity 4, 10
Everybody can do science and invent things and ideas.	**Investigating Water** Activity 2-6, 10-12

	Sunshine and Shadows Activity 6, 8-12 **Sink or Float** Activity 6, 7, 12 **Amazing Air** Activity 10-12
In doing science, it is often helpful to work with a team and to share findings with others. All team members should reach their own individual conclusions, however, about what the findings mean.	**From Seed to Plant** Activity 1, 3-5, 11, 12 **Forces and Motion** Activity 5-9 **Soil Science** Activity 9-12
A lot can be learned about plants and animals by observing them closely, but care must be taken to know the needs of living things and how to provide for them in the classroom.	**Observing and Aquarium** Activity 2-5, 8, 9 **From Seed to Plant** Activity 1-14 **Butterflies and Moths** Activity 1-11 **Classroom Plants** Activity 1-5

K-2 Benchmarks ~ The Physical Setting

Examples of activities for each of the benchmarks are listed.

BENCHMARK	*DSM II*
There are more stars in the sky than anyone can easily count, but they are not scattered evenly, and they are not all the same brightness or color.	**Finding the Moon** Activity 1
The sun can be seen only in the daytime, but the moon can be seen sometimes at night and sometimes during the day. The sun, moon, and stars all appear to move slowly across the sky.	**Finding the Moon** Activity 1, 3, 5
The moon looks a little different every day, but looks the same again about every four weeks.	**Finding the Moon** Activity 4, 9, 10
Some events in nature have a repeating pattern. The weather changes from day to day, but things such as temperature and rain (or snow) tend to be high, low, or medium in the same months every year.	**Finding the Moon** Activity 3, 5 **Weather Watching** Activity 1, 3 **Butterflies and Moths** Activity 1, 6, 9, 11
Water can be a liquid or a solid and can go back and forth from one form to the other. If water is turned into ice and then the ice is allowed to melt, the amount of water is the same as it was before freezing.	**Investigating Water** Activity 10 **States of Matter** Activity 4, 5, 7, 10, 11
Water left in an open container disappears, but water in a closed container does not disappear.	**Investigating Water** Activity 10
Chunks of rocks come in many sizes and shapes, from boulders to grains of sand and even smaller.	**Properties** Activity 2, 5, 7 **Observing an Aquariu**m Activity 1 **Soil Science** Activity 1-7
Change is something that happens to many things.	**Sunshine and Shadows** Activity 4, 6, 8-10 **Investigating Water** Activity 3, 6-12 **Soil Science** Activity 5, 6, 8-12

Animals and plants sometimes cause changes in their surroundings.	**From Seed to Plant** Activity 4, 12 **Observing an Aquarium** Activity 10-12 **Soils Science** Activity 6, 9 **Plant and Animal Populations** Activity 4, 10, 11
Objects can be described in terms of the materials they are made of (clay, cloth, paper, etc.) and their physical properties (color, size, shape, weight, texture, flexibility, etc.).	**Properties** Activity 1-11 **Investigating Water** Activity 1, 2 **Soil Science** Activity 1-4 **States of Matter** Activity 1-3
Things can be done to materials to change some of their properties, but not all materials respond the same way to what is done to them.	**Properties** Activity 10 **Investigating Water** Activity 3, 4, 6, 7, 9 **Sink or Float** Activity 5, 7- 11 **States of Matter** Activity 4, 8-11
The sun warms the land, air and water.	**From Seed to Plant** Activity 11 **Investigating Water** Activity 10 **Weather Watching** Activity 2, 3 **States of Matter** Activity 5
Things move in many different ways, such as straight, zigzag, round and round, back and forth, and fast and slow.	**Finding the Moon** Activity 3-5 **Amazing Air** Activity 10-12 **Sink or Float** Activity 1-5 **Force and Motion** Activity 3-11
The way to change how something is moving is to give it a push or a pull.	**Properties** Activity 6, 9 **Investigating Water** Activity 1, 2 **Amazing Air** Activity 10-12 **Force and Motion** Activity 1-11
Things that make sound vibrate.	**Using Your Senses** Activity 5, 6
Things near the earth fall to the ground unless something holds them up.	**Investigating Wate**r Activity 5 **Sink or Float** Activity 1-5 **Amazing Air** Activity 9, 12
Magnets can be used to make some things move without being touched.	**Properties** Activity 11

K-2 Benchmarks ~ The Living Environment

Examples of activities for each of the benchmarks are listed

BENCHMARK	*DSM II*
Some animals and plants are alike in the way they look and in the things they do, and others are very different from one another.	**Observing an Aquarium** Activity 3-6 **Plant and Animal Populations** Activity 1-7, 9, 10 **Butterflies and Moths** Activity 5, 12 **Classroom Plants** Activity 4, 12
Plants and animals have features that help them live in different environments.	**Observing an Aquarium** Activity 3-6 **From Seed to Plant** Activity 3, 4, 9-12 **Plant and Animal Populations** Activity 4-7, 10, 11 **Butterflies and Moths** Activity 2-5
Stories sometimes give plants and animals attributes they really do not have.	**Observing an Aquarium** Activity 4 Science and Language Arts **From Seed to Plant** Activity 6 Science and Language Arts
There is variation among individuals of one kind within a population.	**Observing an Aquarium** Activity 3, 5, 6, 10 **From Seed to Plant** Activity 2, 7 **Plant and Animal Populations** Activity 1, 4-7 **Butterflies and Moths** Activity 1, 2, 9, 11
Offspring are very much, but not exactly, like their parents and like one another.	**Observing an Aquarium** Activity 10 **Butterflies and Moths** Activity 11 **Plant and Animal Populations** Activity 1, 5, 7
Magnifiers help people see things they could not see without them.	**Observing and Aquarium** Activity 3-9 **From Seed to Plant** Activity 1-6 **Plant and Animal Populations** Activity 2-7

Most living things need water, food, and air.	**Observing an Aquarium** Activity 1, 2, 4, 5 **Classroom Plants** Activity 3, 5 **Plant and Animal Populations** Activity 2, 4, 5-7 **Butterflies and Moths** Activity 1
Animals eat plants or other animals for food and may also use plants (or even other animals) for shelter and nesting.	**Observing an Aquarium** Activity 4, 5, 7 **Butterflies and Moths** Activity 1 **Plant and Animal Populations** Activity 4-7, 10-11
Living things are found almost everywhere in the world. There are somewhat different kinds in different places.	**Observing an Aquarium** Activity 1, 3-5 **From Seed to Plant** Activity 1, 2 **Classroom Plants** Activity 11, 12 **Plant and Animal Populations** Activity 3-7, 10, 11
Plants and animals both need to take in water, and animals need to take in food. In addition, plants need light.	**Observing an Aquarium** Activity 1-3, 5 **Plant and Animal Populations** Activity 2, 5, 8, 11, 14 **Butterflies and Moths** Activity 1 **Classroom Plants** Activity 3, 5
Many materials can be recycled and used again, sometimes in different forms.	**Investigating Water** Activity 12 Science, Technology, and Society
Different plants and animals have external features that help them thrive in different kinds of places.	**Observing an Aquarium** Activity 3-5 **From Seed to Plant** Activity 9-12 **Plant and Animal Populations** Activity 7, 10, 11 **Butterflies and Moths** Activity 2, 8, 12
Some kinds of organisms that once lived on earth have completely disappeared, although they were something like others that are alive today.	

K-2 Benchmarks ~ The Human Organism

<u>NOTE</u>: Many of the benchmarks in this section are typically found in a health program. Examples from DSM II are listed.

BENCHMARK	*DSM II*
People have different external features, such as the size, shape, and color of hair, skin, and eyes, but they are more like one another than like other animals.	**Using Your Senses** Activity 1, 5
People need water, food, air, waste removal, and a particular range of temperatures in their environment, just as other animals do.	
People tend to live in families and communities in which individuals have different roles.	**Using Your Senses** Activity 3 Science and Careers **Plant and Animal Populations** Activity 2 Science and Careers
All animals have offspring, usually with two parents involved. People may prevent some animals from producing offspring.	**Butterflies and Moths** Activity 11 **Plant and Animal Populations** Activity 5-7
A human baby grows inside its mother until its birth. Even after birth, a human baby is unable to care for itself, and its survival depends on the care it receives from adults.	
The human body has parts that help it seek, find, and take in food when it feels hunger—eyes and noses for detecting food, legs to get to it, arms to carry it away, and a mouth to eat it.	**Using Your Senses** Activities 1-3, 5-6, 10-12
Senses can warn individuals about danger; muscles help them to fight, hide, or get out of danger.	**Using Your Senses** Activity 9 Science Challenge
The brain enables human beings to think and send messages to other body parts to help them work properly.	**Using Your Senses** Activity 1, 5, 10
People use their senses to find out about their surroundings and themselves. Different senses give different information. Sometimes a person can get different information about the same thing by moving closer to it or	**Using You Senses** Activity 1-12

further away from it. Some of the things people do, like playing soccer, reading, and writing, must be deliberately learned. Practicing helps people to improve. How well one learns sometimes depends on how one does it and how often and how hard one tries to learn. People can learn from each other by telling and listening, showing and watching, and imitating what others do. Eating a variety of healthful foods and getting enough exercise and rest help people to stay healthy. Some things people take into their bodies from the environment can hurt them. Some diseases are caused by germs, some are not. Diseases caused by germs may be spread by people who have them. Washing one's hands with soap and water reduces the number of germs that can get into the body or that can be passed on to other people. People have many different feelings—sadness, joy, anger, fear, etc.—about events, themselves, and other people. People react to personal problems in different ways. Some ways are more likely to be helpful than others. Talking to someone (a friend, relative, teacher, or counselor) may help people understand their feelings and problems and what to do about them.	**Using Your Senses** Activity 8 Science, Technology, and Society **Using Your Senses** Activity 6 Science Challenge **Plant and Animal Populations** Activity 9 Science Extension

K-2 Benchmarks ~ Common Themes

The common themes are interwoven throughout the DSM II Modules. Some examples of modules that address the themes are listed.

THEME	*DSM II*
SYSTEMS	**From Seed to Plant** **Observing an Aquarium** **Sink or Float** **Using Your Senses** **Weather Watching**
MODELS	**Finding the Moon** **Sunshine and Shadows** **Observing an Aquarium** **Force and Motion** **Amazing Air**
CONSTANCY AND CHANGE	**Finding the Moon** **Properties** **Classroom Plants** **Plant and Animal Populations** **States of Matter**
SCALE	**Sunshine and Shadows** **Observing and Aquarium** **From Seed to Plant** **Soils Science** **Length and Capacity**

3-5 Benchmarks ~ The Nature of Science

<u>NOTE</u>: DSM II modules are inquiry-based. The fundamentals of scientific inquiry are embedded in all modules. Examples of activities for each benchmark are listed.

BENCHMARK	*DSM II*
Results of similar scientific investigations seldom turn out exactly the same. Sometimes this is because of unexpected differences in the things being investigated, sometimes because of unrealized differences in the methods used or in the circumstances in which the investigation is carried out, and sometimes just because of uncertainties in observations. It is not always easy to tell which.	**Classroom Plants** Activity 3, 4 **Looking at Liquids** Activity 5 **Erosion** Activity 4 **Solar Energy** Activity 5, 6
Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments. Investigations can focus on physical, biological. and social questions.	**Amazing Air** Activity 3 **Powders and Crystals** Activity 5-9 **Animal Behavior** Activity 3-7 **Simple Machines** Activity 6
Results of scientific investigations are seldom exactly the same, but if the differences are large, it is important to try to figure out why. One reason for following directions carefully and for keeping records of one's work is to provide information on what might have caused the differences.	**Weather Watching** Activity 2, 3 **Powders and Crystals** Activity 10 **Magnets** Activity 1, 2 **Pollution** Activity 3-5
Scientists' explanations about what happens in the world come partly from what they observe, partly from what they think. Sometimes scientists have different explanations for the same set of observations. That usually leads to their making more observations to resolve the differences.	**Butterflies and Moths** Activity 2 Science and Social Studies **Small Things and Microscopes** Activity 12 Science and Health **Insect Life** Activity 5 Science, Technology, and Society **Fungi—Small Wonders** Activity 2 Science and Health
Scientists do not pay much attention to claims about how something they know works unless the claims are backed up with evidence that can be confirmed and with a logical argument.	**States of Matter** Activity 4, 5 **Dinosaur Classification** Activity 11 **Electrical Circuits** Activity 1, 3 **Pollution** Activity 7

Science is an adventure that people everywhere can take part in, as they have for many centuries.	**Weather Instruments** Activity 4 Science Challenge **Solar System** Activity 2 Science and Social Studies **Small Things and Microscopes** Activity 9 Science and Language Arts **Fungi—Small Wonders** Activity 2 Science and Health
Clear communication is an essential part of doing science. It enables scientists to inform others about their work, expose their ideas to criticism by other scientists, and stay informed about scientific discoveries around the world.	**Sink or Float** Activity 11 Science Extension **Animal Behavior** Activity 12 Science Extension **Fungi—Small Wonders** Activity 7 **Flight and Rocketry** Activity 8
Doing science involves many different kinds of work and engages men and women of all ages and backgrounds.	**Weather Watching** Activity 9 Science and Careers **Small Things and Microscopes** Activity 10 Science and Careers **Rocks and Minerals** Activity 2 Science and Careers **Lenses and Mirrors** Activity 11 Science and Careers

3-5 Benchmarks ~ The Physical Setting

Examples of activities for each of the benchmarks are listed.

BENCHMARK	*DSM II*
The patterns of stars in the sky stay the same. Although they appear to move across the sky nightly, and different stars can be seen in different seasons.	**Solar System** Activity 10
Telescopes magnify the appearance of some distant objects in the sky, including the moon and the planets. The number of stars that can be seen through telescopes is dramatically greater than can be seen by the unaided eye.	**Solar System** Activity 3 Science and Careers
Planets change their positions against the background of stars.	**Solar System** Activity 8
The earth is one of several planets that orbit the sun, and the moon orbits around the earth.	**Solar System** Activity 6, 8
Stars are like the sun, some being smaller and some larger, but so far away that they look like points of light.	**Solar System** Activity 10, 11
Things on or near the earth are pulled toward it by the earth's gravity.	**Solar System** Activity 2
Like all planets and stars, the earth is approximately spherical in shape. The rotation of the earth on its axis every 24 hours produces the night-and -day cycle. To people on earth, this turning of the planet makes it seem as though the sun, moon, planets, and stars are orbiting the earth once a day.	**Solar System** Activity 6, 9
When liquid water disappears, it turns into a gas (vapor) in the air and can reappear as a liquid when cooled, or as a solid if cooled below the freezing point of water. Clouds and fog are made of tiny droplets of water.	**States of Matter** Activity 8-10 **Water Cycle** Activity 1-6, 8, 9, 12, 13

Air is a substance that surrounds us, takes up space, and whose movements we feel as wind.	**Amazing Air** Activity 1-10 **Weather Watching** Activity 4, 5 **Weather Instruments** Activity 4, 5 **Flight and Rocketry** Activity 1
Waves, wind, water, and ice shape and reshape the earth's land surface by eroding rock and soil in some areas and depositing them in other areas, sometimes in seasonal layers.	**Earth Movements** Activity 3 **Erosion** Activity 1-12 **Soil Science** Activity 12
Rock is composed of different combinations of minerals. Smaller rocks come from the breakage and weathering of bedrock and larger rocks. Soil is made partly from weathered rock, partly from plant remains-and also contains many living organisms.	**Soil Science** Activity 1, 3-5, 7 **Erosion** Activity 4 **Rocks and Minerals** Activity 1-10
Heating and cooling cause changes in the properties of materials. Many kinds of changes occur faster under hotter conditions.	**Powders and Crystals** Activity 9
No matter how parts of an object are assembled, the weight of the whole object made is always the same as the sum of the parts; and when a thing is broken into parts, the parts have the same total weight as the original thing.	**Measuring** Activity 10
Materials may be composed of parts that are too small to be seen without magnification.	**Amazing Air** Activity 1-16 **Soil Science** Activity 1, 4 **Small Things and Microscopes** Activity 2, 7-9 **Rocks and Minerals** Activity 6, 8
When a new material is made by combining two or more materials, it has properties that are different from the original materials. For that reason, a lot of different materials can be made from a small number of basic kinds of materials.	**Powders and Crystals** Activity 6
Things that give off light often also give off heat. Heat is produced by mechanical and electrical machines, and any time one thing rubs against something else.	**Electrical Circuits** Activity 8, 10 **Powders and Crystals** Activity 9

	Simple Machines Activity 3 **Solar Energy** Activity 2-10
When warmer things are put with cooler ones, the warm ones lose heat and the cool ones gain it until they are all at the same temperature. A warmer object can warm a cooler one by contact or at a distance.	**Powders and Crystals** Activity 9 **Measuring** Activity 11, 12 **Solar Energy** Activity 2-10
Some materials conduct heat much better than others. Poor conductors can reduce heat loss.	**Solar Energy** Activity 3, 11, 12
Changes in speed or direction of motion are caused by forces. The greater the force is, the greater the change in motion will be. The more massive an object is, the less effect a given force will have.	**Force and Motion** Activity 1-9 **Sound** Activity 8 **Flight and Rocketry** Activity 6, 7 **Simple Machines** Activity 7-9
How fast things move differs greatly. Some things are so slow that their journey takes a long time; others move too fast for people to even see them.	**Electric Circuits** Activity 1 **Sound** Activity 3 **Electromagnetism** Activity 7, 8
The earth's gravity pulls any object toward it without touching it.	**Simple Machines** Activity 1, 2, 8 **Flight and Rocketry** Activity 2, 3
Without touching them, a magnet pulls on all things made of iron and either pushes or pulls on other magnets.	**Magnets** Activity 1-10 **Electromagnetism** Activity 1-6
Without touching them, material that has been electrically charged pulls on all other materials and may either push or pull other charged materials.	**Electric Circuits** Activity 1 Science and Language Arts Activity 2 Science Extension

3-5 Benchmarks ~ The Living Environment

Examples of activities for each of the benchmarks are listed.

BENCHMARK	*DSM II*
A great variety of kinds of living things can be sorted into groups in many ways using various features to decide which things belong to which group.	**Butterflies and Moths** Activity 12 **Dinosaur Classification** Activity 8 **Classroom Plants** Activity 1, 2 **Insect Life** Activity 1, 6
Features used for grouping depend on the purpose of the grouping.	**Dinosaur Classification** Activity 10 **Food Chains and Webs** Activity 11, 12 **Plant and Animal Life Cycles** Activity 1, 11 **Fungi—Small Wonders** Activity 1-3
Some likenesses between children and parents, such as eye color in human beings, or fruit or flower color in plants, are inherited. Other likenesses, such as people's table manners or carpentry skills, are learned.	**Classroom Plants** Activity 10 **Butterflies and Moths** Activity 10 **Plant and Animal Life Cycles** Activity 8, 9 **Small Things and Microscopes** Activity 13
For offspring to resemble their parents, there must be a reliable way to transfer information from one generation to the next.	**Small Things and Microscopes** Activity 8 Science, Technology, and Society
Some living things consist of a single cell. Like familiar organisms, they need food, water, and air; a way to dispose of waste; and an environment they can live in.	**Small Things and Microscopes** Activity 10, 11 **Pond Life** Activity 7 **Fungi—Small Wonders** Activity 4, 5
Microscopes make it possible to see that living things are made mostly of cells. Some organisms are made of a collection of similar cells that benefit from cooperating. Some organisms' cells vary greatly in appearance and perform very different roles in the organism.	**Small Things and Microscopes** Activity 7-9

For any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.	**Plant and Animal Populations** Activity 7 Science, Technology, and Society **Insect Life** Activity 11 Science and Social Studies **Dinosaur Classification** Activity 8 Science Challenge
Insects and various other organisms depend on dead plant and animal material for food.	**Insect Life** Activity 2 Food Chains and Webs Activity 9 **Fungi—Small Wonders** Activity 2
Organisms interact with one another in various ways besides providing food. Many plants depend on animals for carrying their pollen to other plants or for dispersing their seeds.	**Classroom Plants** Activity 9 **Insect Life** Activity 13 **Plant and Animal Life Cycles** Activity 8 **Fungi—Small Wonders** Activity 9 Science and Language Arts
Changes in an organism's habitat are sometimes beneficial to it and sometimes harmful.	**Plant and Animal Populations** Activity 10-12 **Insect Life** Activity 8 **Fungi—Small Wonders** Activity 11
Most microorganisms do not cause disease, and many are beneficial.	**Fungi—Small Wonders** Activity 10, 12 Activity 2 Science and Health
Almost all kinds of animals' food can be traced back to plants.	**Classroom Plants** Activity 1 **Plant and Animal Populations** Activity 6, 7, 9, 10, 12 **Food Chains and Webs** Activity 3, 11, 12 **Pond Life** Activity 11
Some source of "energy" is needed for all organisms to stay alive and grow.	**Classroom Plants** Activity 1 **Plant and Animal Populations** Activity 12 **Food Chains and Webs** Activity 3, 11, 12
Over the whole earth, organisms are growing, dying, and decaying, and new organisms are being produced by the old ones.	**Small Things and Microscopes** Activity 12 Science, Technology, and Society **Fungi—Small Wonders** Activity 2, 6, 12
Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in	**Butterflies and Moths** Activity 8 Science, Technology, and Society

surviving and reproducing. Fossils can be compared to one another and to living organisms according to their similarities and differences. Some organisms that lived long ago are similar to existing organisms, but some are quite different.	**Insect Life** Activity 11 Science and Social Studies **Dinosaur Classification** Activity 2-8, 11

3-5 Benchmarks ~ The Human Organism

<u>NOTE</u>: Many of the benchmarks in this section are typically found in a health program. Examples from DSM II are listed.

BENCHMARK	*DSM II*
Unlike in human beings, behavior in insects and many other species is determined almost entirely by biological inheritance.	**Plant and Animal Populations** Activity 10, 11 **Animal Behavior** Activity 3-8 **Insect Life** Activity 8
Human beings have made tools and machines to sense and do things that they could not otherwise sense or do at all, or as quickly, or as well.	**Using Your Senses** Activity 4 Science, Technology, and Society Activity 1 Science and Social Studies **Small Things and Microscopes** Activity 3
Artifacts and preserved remains provide some evidence of the physical characteristics and possible behavior of human beings who lived a very long time ago. It takes about 9 months for a human embryo to develop. Embryos are nourished by the mother, so substances she takes in will affect how well or poorly the baby develops.	**Dinosaur Classification** Activity 6 Science Extension **Rocks and Minerals** Activity 11 **Erosion** Activity 12 Science, Technology, and Society
Human beings live longer than most other animals, but all living things die. There is a usual sequence of physical and mental development among human beings, although individuals differ in exactly when they learn things. People are usually able to have children before they are able to care for them properly.	**Plant and Animal Populations** Activity 4, 5, 10, 11 **Insect Life** Activity 10 **Food Chains and Webs** Activity 10-12
From food, people obtain energy and materials for body repair and growth. The undigestible parts of food are eliminated.	**You and Your Body** Activity 9-12
By breathing, people take in the oxygen they need to live.	**You and your Body** Activity 5, 6

Skin protects the body from harmful substances and other organisms and from drying out.	**Using Your Senses** Activity 8
The brain gets signals from all parts of the body telling what is going on there. The brain also sends signals to parts of the body to influence what they do.	**Using Your Senses** Activity 1, 3, 5, 8, 10 **You and Your Body** Activity 3 Science and Language Arts
Human beings have different interests, motivations, skills, and talents.	**Butterflies and Moths** Activity 6 Science and Careers **Fungi—Small Wonders** Activity 7 Science and Careers **Pollution** Activity 6 Science Careers
Human beings can use the memory of their past experiences to make judgements about new situations.	**Using Your Senses** Activity 3 Science and Language Arts **Insect Life** Activity 8 Science and Social Studies **You and Your Body** Activity 8 Science and Careers
Many skills can be practiced until they become automatic. If the right skills are practiced, performance may improve. Human beings tend to repeat behaviors that feel good or have pleasant consequences and avoid behaviors that feel bad or have unpleasant consequences. Learning means using what one already knows to make sense out of new experiences or information, not just storing the new information in one's head.	**Using Your Senses** Activity 7 Science Challenge **You and Your Body** Activity 3
Food provides energy and materials for growth and repair of body parts. Vitamins and minerals, present in small amounts in foods, are essential to keep everything working well. As people grow up, the amounts and kinds of food and exercise needed by the body may change.	**You and Your Body** Activity 9-12
Tobacco, alcohol, other drugs, and certain poisons in the environment (pesticides, lead) can harm human beings and other living things.	**You and Your Body** Activity 6 Science and Health **Pollution** Activity 9 Science and Health

	Pond Life Activity 11 Science, Technology, and Society
If germs are able to get inside one's body, they may keep it from working properly. For defense against germs, the human body has tears, saliva, skin, some blood cells, and stomach secretions. A healthy body can fight most germs that do get inside. However, there are some germs that interfere with the body's defenses. There are some diseases that human beings can catch only once. After they've recovered they don't get sick from them again. There are many diseases that can be prevented by vaccination, so that people don't catch them even once. Different individuals handle their feelings differently, and sometimes they have different feelings in the same situation. Often human beings don't understand why others act the way they do, and sometimes they don't understand their own behavior and feelings. Physical health can affect people's emotional well—being And vice—versa. One way to respond to a strong feeling, either pleasant or unpleasant, is to think about what caused it and then consider whether to seek out or avoid similar situations.	**Using Your Senses** Activity 8 **Small Things and Microscopes** Activity 12 **Fungi—Small Wonders** Activity 12 Activity 2 Science and Health

3-5 Benchmarks ~ Common Themes

The common themes are interwoven throughout the DSM II Modules. Some examples of modules that address the themes are listed.

THEME	*FOSS*	*DSM II*
SYSTEMS	**Human Body** **Measurement** **Magnetism and Electricity** **Environments** **Levers and Pulleys**	**Weather Watching** **Plant and Animal Life Cycles** **Solar System** **Pond Life** **You and Your Body**
MODELS	**Water** **Solar Energy** **Landforms** **Variables** **Models and Design**	**Force and Motion** **Dinosaur Classification** **Erosion** **Flight and Rocketry** **Simple Machines**
CONSTANCY AND CHANGE	**Ideas and Inventions** **Structures of Life** **Mixtures and Solutions** **Environments** **Levers and Pulleys**	**States of Matter** **Water Cycle** **Powders and Crystals** **Color and Light** **Rocks and Minerals**
SCALE	**Measurement** **Earth Materials** **Landforms** **Food and Nutrition** **Solar Energy**	**Soil Science** **Earth Movements** **Small Things and Microscopes** **Oceans** **Solar Energy**

6-8 Benchmarks ~ The Nature of Science

<u>NOTE</u>: DSM II modules are inquiry-based. The fundamentals of scientific inquiry are embedded in all modules. Examples of activities for each benchmark are listed.

BENCHMARK	*DSM II*
When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, and it often takes further studies to decide. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as correct.	**Erosion** Activity 4 **Simple Machines** Activity 6 **Famous Scientists** Activity 3
Scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.	**Astronomy** Activity 1 Science Extension **Earth Processes** Activity 14 Science Extension **Famous Scientists** Activity 3
Some scientific knowledge is very old and yet is still applicable today.	**Electrical Connections** Activity 12 Science and Social Studies **Newton's Toy Box** Activity 5 Science and Social Studies **Famous Scientists** Activity 1, 3, 5 **Chemical Interactions** Activity 6 Science and Social Studies
Some matters cannot be examined usefully in a scientific way. Among them are matters that by their nature cannot be tested objectively and those that are essentially matters of morality. Science can sometimes be used to inform ethical decisions by identifying the likely consequences of particular actions but cannot be used to establish that some action is either moral or immoral.	
Scientists differ greatly in what phenomena they study and how they go about their work. Although there is no fixed set of steps that all scientists follow, scientific investigations usually involve the collection of relevant evidence, the use of logical reasoning, and	**Erosion** Activity 5 **Flight and Rocketry** Activity 8 **Famous Scientists** Activity 1, 3, 5 **Solar Energy** Activity 3

the application of imagination in devising hypotheses and explanations to make sense of the collected evidence.	
If more than one variable changes at the same time in an experiment, the outcome of the experiment may not be clearly attributable to any one of the variables. It may not always be possible to prevent outside variables from influencing the outcome of an investigation (or even to identify all of the variables), but collaboration among investigators can often lead to research designs that are able to deal with such situations.	**Pollution** Activity 7 **Solar Energy** Activity 6-8 **Fungi—Small Wonders** Activity 7 **Electromagnetism** Activity 6
What people expect to observe often affects what they actually do observe. Strong beliefs about what should happen in particular circumstances can prevent them from detecting other results. Scientists know about this danger to objectivity and take steps to try and avoid it when designing investigations and examining data. One safeguard is to have different investigators conduct independent studies of the same questions.	**Famous Scientists** Activity 3
Important contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures at different times.	**Pond Life** Activity 2 Science and Social Studies **Famous Scientists** Activity 1, 3, 5, 7, 9, 11 **Chemical Interactions** Activity 2 Science and Social Studies **Newton's Toy Box** Activity 5 Science and Social Studies
Until recently, women and racial minorities, because of restrictions on their education and employment opportunities, were essentially left out of much of the formal work of the science establishment; the remarkable few who overcame those obstacles were even then likely to have their work disregarded by the science establishment.	**Famous Scientists** Activity 9 **Astronomy** Activity 9 Science and Language Arts
No matter who does science and mathematics or invents things, or when or where they do it, the knowledge and technology that result can eventually become available to everyone in the world.	**Pond Life** Activity 2 Science and Social Studies **Famous Scientists** Activity 1, 3, 5, 7, 9, 11 **Chemical Interactions** Activity 2 Science and Social Studies

	Newton's Toy Box Activity 5 Science and Social Studies
Scientists are employed by colleges and universities, business and industry, hospitals, and many government agencies. Their places of work include offices, classrooms, laboratories, farms, factories, and natural field settings ranging from space to the ocean floor.	**Weather Forecasting** Activity 8 Science and Careers **Astronomy** Activity 9 Science and Careers **Chemical Interactions** Activity 9 Science and Careers **Oceans** Activity 12 Science and Careers
In research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate. Science ethics also demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks without their prior knowledge and consent. Because animals cannot make informed choices, special care must be taken in using them in scientific research.	

6-8 Benchmarks ~ The Physical Setting

Examples of activities for each of the benchmarks are listed.

BENCHMARK	*DSM II*
The sun is a medium-sized star located near the edge of a disk-shaped galaxy of stars, part of which can be seen as a glowing band of light that spans the sky on a very clear night. The universe contains many billions of galaxies, and each galaxy contains many billions of stars. To the naked eye, even the closest of these galaxies is no more than a dim, fuzzy spot.	**Astronomy** Activity 11
The sun is many thousands of times closer to the earth than any other star. Light from the sun takes a few minutes to reach the earth, but light from the nearest star takes a few years to arrive. The trip to that star would take the fastest rocket thousands of years. Some distant galaxies are so far away that their light takes several billion years to reach the earth. People on earth, therefore, see them as they were long ago in the past.	**Astronomy** Activity 8
Nine planets of very different size, composition, and surface features move around the sun in nearly circular orbits. Some planets have great variety of moons and even flat rings of rock and ice particles orbiting around them. Some of these planets and moons show evidence of geologic activity. The earth is orbited by one moon, many artificial satellites, and debris.	**Earth, Moon, and Sun** Activity 3, 4, 5 **Astronomy** Activity 6
Large numbers of chunks of rock orbit the sun. Some of those that the earth meets in its yearly orbit around the sun glow and disintegrate from friction as they plunge through the atmosphere-and sometimes impact the ground. Other chunks of rocks mixed with ice have long, off-center orbits that carry them close to the sun, where the sun's radiation (of light and particles) boils off frozen material from their surfaces and pushes it into a long, illuminated tail.	

We live on a relatively small planet, the third from the sun in the only system of planets definitely known to exist (although other, similar systems may be discovered in the universe).	**Earth, Moon, and Sun** Activity 3, 4 **Astronomy** Activity 6
The earth is mostly rock. Three-fourths of its surface is covered by a relatively thin layer of water (some of it frozen) and the entire planet is surrounded by a relatively thin blanket of air. It is the only body in the solar system that appears able to support life. The other planets have compositions and conditions very different from the earth's.	**If Ship Wrecks Could Talk** Activity 1
Everything on or anywhere near the earth is pulled toward the earth's center by gravitational force.	**Famous Scientists** Activity 3 **Newton's Toy Box** Activity 2, 4
Because the earth turns daily on an axis that is tilted relative to the plane of the earth's yearly orbit around the sun, sunlight falls more intensely on different parts of the earth during the year. The difference in heating of the earth's surface produces the planet's seasons and weather patterns.	**Solar Energy** Activity 6 Science Extension **Astronomy** Activity 5 **Earth, Moon, and Sun** Activity 9
The moon's orbit around the earth once in about 28 days changes what part of the moon is lighted by the sun and how much of that part can be seen from the earth-the phases of the moon.	**Earth, Moon, and Sun** Activity 10
Climates have sometimes changed abruptly in the past as a result of changes in the earth's crust, such as volcanic eruptions or impacts of huge rocks from space. Even relatively small changes in atmospheric or ocean content can have widespread effects on climate if the change lasts long enough.	**Pollution** Activity 9 Science, Technology, and Society
The cycling of water in and out of the atmosphere plays an important role in determining climatic patterns. Water evaporates from the surface of the earth, rises and cools, condenses into rain or snow, and falls again to the surface. The water falling on land collects in rivers and lakes, soil, and porous layers of rock, and much of it flows back into the ocean.	**Weather Forecasting** Activity 9

Fresh water, limited in supply, is essential for life and also for most industrial processes. Rivers, lakes, and groundwater can be depleted or polluted, becoming unavailable or unsuitable for life.	**Erosion** Activity 7 Science and Health **Pollution** Activity 5-7
Heat energy carried by ocean currents has a strong influence on climate around the world.	**Oceans** Activity 8 Science Challenge
Some minerals are very rare and some exist in great quantities, but-for practical purposes-the ability to recover them is just as important as their abundance. As minerals are depleted, obtaining them becomes more difficult. Recycling and the development of substitutes can reduce the rate of depletion but may also be costly.	**Rocks and Minerals** Activity 11
The benefits of the earth's resources-such as fresh water, air, soil, and trees-can be reduced by using them wastefully or by deliberately or inadvertently destroying them. The atmosphere and the ocean have limited capacity to absorb wastes and recycle materials naturally. Cleaning up polluted air, water, or soil or restoring depleted soil, forests, or fishing grounds can be very difficult.	**Pollution** Activity 4, 6, 9 Activity 5 Science, Technology, and Society Activity 10 Science, Technology, and Society
The interior of the earth is hot. Heat flow and movement of material within the earth cause earthquakes and volcanic eruptions and create mountains and ocean basins. Gas and dust from large volcanoes can change the atmosphere.	**Oceans** Activity 4 **Erosion** Activity 1 Science and the Arts **Earth Processes** Activity 2, 5, 7, 10-13
Some changes in the earth's surface are abrupt (such as earthquakes and volcanic eruptions) while other changes happen very slowly (such as uplift and wearing down of mountains). The earth's surface is shaped in part by the motions of water and wind over very long times, which act to level mountain ranges.	**Oceans** Activity 4 **Rocks and Minerals** Activity 10 Science Challenge **Erosion** Activity 1-3, 5-6, 9-12 **Earth Processes** Activity 3, 5, 7, 8, 10, 14
Sediments of sand and smaller particles (sometimes containing the remains of organisms) are gradually buried and are cemented together by dissolved minerals to form solid rock again.	**Rocks and Minerals** Activity 2, 9 **Earth Processes** Activity 4

Sedimentary rock buried deep enough may be reformed by pressure and heat, perhaps melting and recrystallizing into different kinds of rock. These re-formed rock layers may be forced up again to become land surfaces and even mountains. Subsequently, this new rock too will erode. Rock bears evidence of the minerals, temperatures, and forces that created it.	**Rocks and Minerals** Activity 2, 10 **Earth Processes** Activity 5, 6
Thousands of layers of sedimentary rock confirm the long history of the changing surface of the earth and the changing life forms whose remains are found in successive layers. The youngest layers are not always found on top, because of folding, breaking, and uplift of layers.	**Rocks and Minerals** Activity 10 Science Extension Science Challenge **Earth Processes** Activity 2 Science Challenge Activity 4 Science Challenge
Although weathered rock is the basic component of soil, the composition and texture of soil and its fertility and resistance to erosion are greatly influenced by plant roots and debris, bacteria, fungi, worms, insects, rodents, and other organisms.	**Erosion** Activity 8 Activity 3 Science Extension **Earth Processes** Activity 3
Human activities, such as reducing the amount of forest cover, increasing the amount and variety of chemicals released into the atmosphere, and intensive farming, have changed the earth's land, oceans, and atmosphere. Some of these changes have decreased the capacity of the environment to support some life forms.	**Pollution** Activity 10 Science and Social Studies **Oceans** Activity 11 Science Challenge **Erosion** Activity 1, Activity 11 Science and Social Studies **Earth Processes** Activity 4 Science, Technology, and Society
All matter is made up of atoms, which are far too small to be seen directly through a microscope. The atoms of any element are alike but different from atoms of other elements. Atoms may stick together in well-defined molecules or may be packed together in large arrays. Different arrangements of atoms into groups compose all substances.	**Chemical Interactions** Activity 4-6
Equal volumes of different substances usually have different weights.	**Chemical Interactions** Activity 1
Atoms and molecules are perpetually in motion. Increased temperature means greater average energy of motion, so most	**Chemical Interactions** Activity 2 Science Extension **Flight and Rocketry** Activity 3

substances expand when heated. In solids, the atoms are closely locked in position and can only vibrate. In liquids, the atoms or molecules have higher energy, are more loosely connected, and can slide past one another; some molecules may get enough energy to escape into a gas. In gases, the atoms or molecules have still more energy and are free of one another except during occasional collisions. The temperature and acidity of a solution influence reaction rates. Many substances dissolve in water, which may greatly facilitate reactions between them.	
Scientific ideas about elements were borrowed from some Greek philosopher of 2,000 years earlier, who believed that everything was made from four basic substances: air, earth, fire, and water. It was the combination of these "elements" in different proportions that gave other substances their observable properties. The Greeks were wrong about those four, but now over 100 different elements have been identified, some rare and some plentiful, out of which everything is made. Because most elements tend to combine with others, few elements are found in their pure form.	**Chemical Interactions** Activity 4
There are groups of elements that have similar properties, including highly reactive metals, less-reactive metals, highly reactive nonmetals (such as chlorine, fluorine, and oxygen), and some almost completely nonreactive gases (such as helium and neon). An especially important kind of reaction between substances involves combination of oxygen with something else—as in burning or rusting. Some elements don't fit into any of the categories; among them are carbon and hydrogen, essential elements of living matter.	**Chemical Interactions** Activity 4, 12
No matter how substances within a closed system interact with one another, or how they combine or break apart, the total weight of the system remains the same. The idea of atoms explains the conservation of matter. If the number of atoms stays the same no matter how they are rearranged, then their total mass stays the same.	**Chemical Interaction** Activity 7

Energy cannot be created or destroyed, but only changed from one form into another.	**Solar Energy** Activity 1-10 **Electromagnetism** Activity 7-9 **Electrical Connections** Activity 11 **Newton's Toy Box** Activity 8
Most of what goes on in the universe—from exploding stars and biological growth to the operation of machines and the motion of people—involves some form of energy being transformed into another. Energy in the form of heat is almost always one of the products of an energy transformation.	**Solar Energy** Activity 1-10 **Electrical Connections** Activity 2, 6-8, 11 **Newton's Toy Box** Activity 8, 10 **Electromagnetism** Activity 7-9
Heat can be transferred through materials by the collisions of atoms or across space by radiation. If the material is fluid, currents will be set up in it that will aid the transfer of heat.	**Flight and Rocketry** Activity 3 **Solar Energy** Activity 1-10 **Electrical Connections** Activity 7
Energy appears in different forms. Heat energy is in the disorderly motion of molecules; chemical energy is in the arrangement of atoms; mechanical energy is in moving bodies or in elastically distorted shapes; gravitational energy is in the separation of mutually attracting masses.	**Flight and Rocketry** Activity 8, 9, 12 **Electromagnetism** Activity 5 **Solar Energy** Activity 1-11 **Electrical Connections** Activity 2, 9, 10
Light from the sun is made up of a mixture of many different colors of light, even though to the eye the light looks almost white. Other things that give off or reflect light have a different mix of colors.	**Color and Light** Activity 1, 2, 4-7
Something can be "seen" when light waves emitted or reflected by it enter the eye—just as something can be "heard" when sound waves from it enter the ear.	**You and Your Body** Activity 14 **Lenses and Mirrors** Activity 10
An unbalanced force acting on an object changes its speed or direction of motion, or both. If the force acts toward a single center, the object's path may curve into orbit around the center.	**Simple Machines** Activity 3, 6, 8, Activity 5 Science, Technology, and Society **Flight and Rocketry** Activity 2, 3, 8, 9, 12 **Newton's Toy Box** Activity 1, 3, 7, 8, 11, 12
Vibrations in materials set up wavelike disturbances that spread away from the source. Sound and earthquake waves are examples. These and other waves move at	**Electromagnetism** Activity 8 Science Challenge **Famous Scientists** Activity 8

different speeds in different materials.	**Earth Processes** Activity 8, 9
Human eyes respond to only a narrow range of wavelengths of electromagnetic radiation—visible light. Differences of wavelength within that range are perceived as differences in color.	**Color and Light** Activity 1 Science, Technology, and Society
Every object exerts gravitational force on every other object. The force depends on how much mass the objects have and on how far apart they are. The force is hard to detect unless at least one of the objects has a lot of mass.	**Famous scientists** Activity 3 **Oceans** Activity 9
The sun's gravitational pull holds the earth and other planets in their orbits; just as the planets' gravitational pull keeps their moons in orbit around them.	**Famous Scientists** Activity 12 Science Extension **Earth, Sun, and Moon** Activity 12
Electric currents and magnets can exert a force on each other.	**Electromagnetism** Activity 5-11 **Electrical Connections** Activity 11

6-8 Benchmarks ~ The Living Environment

Examples of activities for each of the benchmarks are listed.

BENCHMARK	*DSM II*
One of the most general distinctions among organisms is between plants, which use sunlight to make their own food, and animals, which consume energy-rich foods. Some kinds of organisms, many of them microscopic, cannot be neatly classified as either plants or animals.	**Pond Life** Activity 3, 5-7, 10 **Fungi—Small Wonders** Activity 1, 2, 4, 6 **Plants in Our World** Activity 1, 8
Animals and plants have a great variety of body plans and internal structures that contribute to their being able to make or find food.	**Pond Life** Activity 8-10 **You and Your Body** Activity 1-3, 5, 8, 13, 14 **Fungi—Small Wonders** Activity 1-4, 6 **Plants in Our World** Activity 2, 4, 8
Similarities among organisms are found in internal anatomical features, which can be used to infer the degree of relatedness among organisms. In classifying organisms, biologists consider details of internal and external structures to be more important than behavior or general appearance. For sexually reproducing organisms, a species comprises all organisms that can mate with one another to produce fertile offspring.	**Pond Life** Activity 5-10 **Fungi—Small Wonders** Activity 2, 4, 6 **Plants in Our World** Activity 1 Science Challenge Activity 2 **Famous Scientists** Activity 9
All organisms, including the human species, are part of and depend on two main interconnected global food webs, One includes microscopic ocean plants, the animals that feed on them, and finally the animals that feed on those animals. The other web includes land plants, the animals that feed on them, and so forth. The cycles continue indefinitely because organisms decompose after death to return food material to the environment.	**Pond Life** Activity 11 **Fungi—Small Wonders** Activity 12 Science, Technology, and Society **Plants in Our World** Activity 11
In some kinds of organisms, all the genes come from a single parent, whereas in organisms that have sexes, typically half of the genes come from each parent.	**Fungi—Small Wonders** Activity 4 **DNA—From Genes to Protein** Activity 1 Science Challenge Activity 11

In sexual reproduction, a single specialized cell from a female merges with a specialized cell from a male. As the fertilized egg, carrying genetic information from each parent, multiplies to form the complete organism with about a trillion cells, the same genetic information is copied in each cell.	**DNA—From Genes to Protein** Activity 1 Science Challenge Activity 5 Science Extension Activity 5 Science Extension
New varieties of cultivated plants and domestic animals have resulted from selective breeding for particular traits.	**Plants in Our World** Activity 12 Science, Technology, and Society
All living things are composed of cells, from just one to millions, whose details usually are visible only through a microscope. Different body tissues and organs are made up of different kinds of cells. The cells in similar tissues and organs in other animals are similar to those in human beings but different somewhat from cells found in plants.	**DNA—From Genes to Protein** Activity 3, 4
Cells continually divide to make more cells for growth and repair. Various organs and tissues function to serve the needs of cells for food, air, and waste removal.	**DNA—From Genes to Protein** Activity 5 Science Extension
Within cells, many of the basic functions of organisms—such as extracting energy from food and getting rid of waste—are carried out. The way in which cells function is similar in all living organisms. About two thirds of the weight of the cells is accounted for by water, which gives cells many of their properties.	**Pond Life** Activity 7 Science and Language Arts **Fungi—Small Wonders** Activity 4 **DNA—From Genes to Protein** Activity 3, 4
In all environments—freshwater, marine, forest, desert, grassland, mountains, and others—organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter. In any particular environment, the growth and survival of organisms depend on the physical conditions.	**Pond Life** Activity 4, 6, 11 **Fungi—Small Wonders** Activity 5 **Plants in Our World** Activity 3
Two types of organisms may interact with one another in several ways. They may be in a producer/consumer, predator/ prey, or parasite/host relationship. Or one organism may scavenge or decompose another.	**Pond Life** Activity 11 Activity 5 Science Challenge **Fungi—Small Wonders** Activity 8 Science, Technology, and Society

Relationships may be competitive or mutually beneficial. Some species have become so adapted to each other that neither could survive without the other.	Activity 9 Science and Language Arts **Plants in Our World** Activity 8 Science and Social Studies
Food provides molecules that serve as fuel and building material for all organisms. Plants use the energy from light to make sugars from carbon dioxide and water. This food can be used immediately or stored for later use. Organisms that eat plants break down the plant structures to produce the materials and energy they need to survive. Then they are consumed by other organisms.	**You and Your Body** Activity 8, 12 **Pond Life** Activity 6, 10, 11 **Fungi—Small Wonders** Activity 4 Science Extension Activity 5, 6 **Plants in Our World** Activity 8-10
Over a long time, matter is transferred from one organism to another repeatedly and between organisms and their physical environment. As in all materials systems, the total amount of matter remains constant, even though its form and location change.	**Pond Life** Activity 11 **Fungi—Small Wonders** Activity 5 Science Extension Activity 6 Science Extension **Plants in Our World** Activity 5 Science extension Activity 11
Energy can change from one form to another in living things. Animals get energy from oxidizing their food, releasing some of its energy as heat. Almost all food energy comes originally from sunlight.	**Pond Life** Activity 11 Activity 11 Science Extension **Plants in Our World** Activity 10, 11
Small differences between parents and offspring can accumulate (through selective breeding) in successive generations so that descendants are very different from their ancestors.	**Plants in Our World** Activity 12 Science, Technology, and Society
Individual organisms with certain traits are more likely than others to survive and have offspring. Changes in environmental conditions can affect the survival of individuals organisms and entire species.	**DNA—From Genes to Protein** Activity 2 Science Challenge
Many thousands of layers of sedimentary rock provide evidence for the long history of the earth and for the long history of changing life forms whose remains are found in the rocks. More recently deposited rock layers are more likely to contain fossils resembling existing species.	**Rocks and Minerals** Activity 10 Science Extension **Earth Processes** Activity 2 Science Challenge Activity 2 Science extension Activity 4 Science Challenge

6-8 Benchmarks ~ The Human Organism

<u>NOTE</u>: Many of the benchmarks in this section are typically found in a health program. Examples from DSM II are listed.

BENCHMARK	*DSM II*
Like other animals, human beings have body systems for obtaining and providing energy, defense, reproduction, and the coordination of body functions.	**You and Your Body** Activity 1-6
Human beings have many similarities and differences. The similarities make it possible for human beings to reproduce and to donate blood and organs to one another throughout the world. Their differences enable them to create diverse social and cultural arrangements and to solve problems in a variety of ways.	**You and Your Body** Activity 4 Science, Technology, and Society **DNA—From Genes to Protein** Activity 1 Activity 13 Science, Technology, and Society
Artifacts and preserved remains provide some evidence of the physical characteristics and possible behavior of human beings who lived a very long time ago.	**Erosion** Activity 12 Science, Technology, and Society
Fertilization occurs when sperm cells from a male's testes are deposited near an egg cell from the female's ovary, and one of the sperm cells enters the egg cell. Most of the time, by chance or design, a sperm never arrives or an egg isn't available.	
Contraception measures may incapacitate sperm, block their way to the egg, prevent the release of eggs, or prevent the fertilized egg from implanting successfully.	
Following fertilization, cell divisions produce a small cluster of cells that then differentiate by appearance and function to form the basic tissues of an embryo. During the first three months of pregnancy, organs begin to form. During the second three months, all organs and body features develop. During the last three months, the organs and features mature enough to function well after birth. Patterns of human development are similar to those of other vertebrates.	

The developing embryo—and later the newborn infant—encounters many risks from faults in its genes, its mother's inadequate diet, her cigarette smoking or use of alcohol or other drugs, or from infection. Inadequate child care may lead to lower physical and mental ability. Various body changes occur as adults age. Muscles and joints become less flexible, bones and muscles loss mass, energy levels diminish, and senses become less acute. Women stop releasing eggs and hence can no longer reproduce. The length and quality of human life are influenced by many factors, including sanitation, diet, medical care, sex, genes, environmental conditions, and personal health behaviors.	
Organs and organ systems are composed of cells and help to provide all cells with basic needs.	**You and Your Body** Activity 1, 2, 4, 6
For the body to use food for energy and building materials, the food must first be digested into molecules that are absorbed and transported to cells.	
To burn food for the release of energy stored in it, oxygen must be supplied to cells, and carbon dioxide removed. Lungs take in oxygen for the combustion of food and they eliminate the carbon dioxide produced. The urinary system disposes of dissolved waste molecules, the intestinal tract removes solid wastes, and the skin and lungs rid the body of heat energy. The circulatory system moves all these substances to or from cells where they are needed or produced, responding to changing demands.	**You and Your Body** Activity 4-6
Specialized cells and the molecules they produce identify and destroy microbes that get inside the body.	
Hormones are chemicals from glands that affect other body parts. They are involved in helping the body respond to danger and in regulating human growth, development, and reproduction.	**You and Your Body** Activity 11 Science and Health

Interactions among the senses, nerves, and brain make possible the learning that enables human beings to cope with changes in their environment.	**You and Your Body** Activity 3, 13, 14
Some animal species are limited to a repertoire of genetically determined behaviors; others have more complex brains and can learn a wide variety of behaviors. All behavior is affected by both inheritance and experience.	**Pond Life** Activity 8, 9
The level of skill a person can reach in any particular activity depends on innate abilities, the amount of practice, and the use of appropriate learning technologies.	**You and Your Body** Activity 2 Science Extension Activity 3
Human beings can detect a tremendous range of visual and olfactory stimuli. The strongest stimulus they can tolerate may be more than a trillion times as intense as the weakest they can detect. Still, there are many kinds of signals in the world that people cannot detect directly. Attending closely to any one input of information usually reduces the ability to attend to others at the same time.	**Color and Light** Activity 3 Activity 13 Science, Technology, and Society **Pollution** Activity 12 Science and Math
Learning often results from two perceptions or actions occurring at about the same time. The more often the same combination occurs, the stronger the mental connection between them is likely to be. Occasionally a single vivid experience will connect two things permanently in people's minds.	**You and Your Body** Activity 10 Science Extension
Language and tools enable human beings to learn complicated and varied things from others.	**You and Your Body** Activity 10 Science Challenge
The amount of food energy (calories) a person requires varies with body weight, age, sex, activity level, and natural body efficiency. Regular exercise is important to maintain a healthy heart/lung system, good muscle tone, and bone strength.	**You and Your Body** Activity 12

Toxic substances, some dietary habits, and some personal behavior may be bad for one's health. Some effects show up right away, others may not show up for years. Avoiding toxic substances, such as tobacco, and changing dietary habits to reduce the intake of such things as animal fat increases the chances of living longer.	**Pollution** Activity 4 Science and Health **You and Your Body** Activity 6 Science and Health Activity 7 Science and Health **DNA—From Genes to Protein** Activity 1 Science and Health
Viruses, bacteria, fungi, and parasites may infect the human body and interfere with normal body functions. A person can catch a cold many times because there are many varieties of cold viruses that cause similar symptoms. White blood cells engulf invaders or produce antibodies that attack them or mark them for killing by other white cells. The antibodies produced will remain and can fight off subsequent invaders of the same kind.	**Fungi—Small Wonders** Activity 2 Science and Health Activity 12
The environment may contain dangerous levels of substances that are harmful to human beings. Therefore, the good health of individuals requires monitoring the soil, air, and water and taking steps to keep them safe.	**Pollution** Activity 5 Science, Technology, and Society Activity 9 Science, Technology, and Society Activity 10 Science and Social Studies
Individuals differ greatly in their ability to cope with stressful situations. Both external and internal conditions (chemistry, personal history, values) influence how people behave. Often people react to mental distress by denying that they have any problem. Sometimes they don't know why they feel the way they do, but with help they can sometimes uncover the reasons.	

6-8 Benchmarks ~ Common Themes

The common themes are interwoven throughout the DSM II Modules. Some examples of modules that address the themes are listed.

THEME	*DSM II*
SYSTEMS	**You and Your Body** **Pond Life** **Electrical Connections** **Earth, Moon, and Sun** **Plants in Our World**
MODELS	**Simple Machines** **Flight and Rocketry** **Erosion** **Chemical Interactions** **DNA—From Genes to Protein** **Earth Processes**
CONSTANCY AND CHANGE	**Rocks and Minerals** **Color and Light** **Earth Processes** **Earth, Moon, and Sun** **Chemical Interactions**
SCALE	**Solar Energy** **Oceans** **Astronomy** **DNA—From Genes to Protein** **Earth, Moon, and Sun**