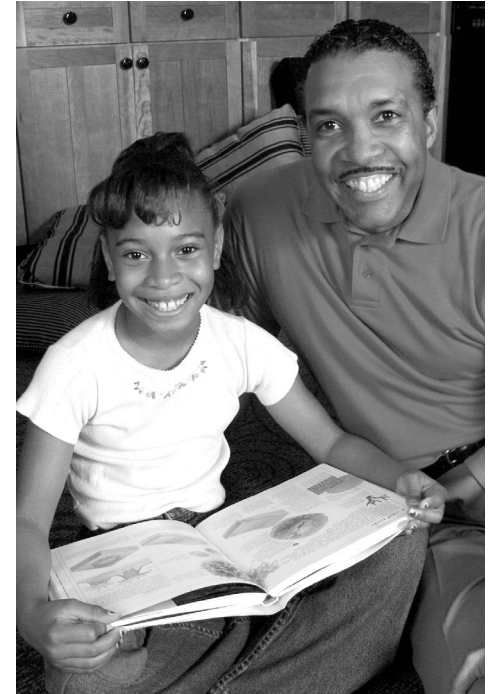


A Standards Guide for Families



25 South Front Street
Columbus, Ohio 43215-4183
1-(877)-OHIOEDU

The Ohio Department of Education does not discriminate on the basis of race, color, national origin, sex, religion, age, or disability in employment or the provision of services.

2003ODE058

Total copies printed: 299,110 Unit cost: .0082 Publication date: 8/03

www.OhioAcademicStandards.com

Reading
Writing
Mathematics
Science
Social Studies

What is Expected
in Grade

5



Standards now,
knowledge for a lifetime.

Dear Family,

Education in Ohio is changing. This change will help your child succeed in school. It also will better prepare your child for success in college or the work force upon high school graduation.

The basis of this change is new **academic content standards**, which define what your child should know and be able to do at every grade level. There are new standards in English language arts (reading and writing), mathematics, science and social studies.

These new standards let teachers know what they are expected to teach and students know what they are expected to learn. Standards also help educators identify and measure what students know and can do.

Part of this system will include achievement tests to determine how well your child is making progress toward these new standards. These tests will replace the current Ohio Proficiency Tests.

The information in this guide will give you a sample of some of the things your child will need to know and be able to do in reading, writing, mathematics, science and social studies for the fifth grade. The guide also has helpful practice problems, tips and activities you can do with your child to help him or her achieve the new standards.

*It is important to note that the information in this guide is **not** the complete set of standards; rather, this information is designed to highlight a select number of skills that your child should know and be able to do in the fifth grade.* The official standards documents, designed for teachers' use, are in some cases several hundred pages long. This booklet has been reduced to this size for your convenience.

To view the complete set of standards, visit the Ohio Department of Education Web site at **www.ohioacademicstandards.com**.

I sincerely thank you for the time, interest and energy you are investing in your child's education. I hope this guide is one of many tools you use to help your child reach these new standards and achieve success inside and outside the classroom.

Sincerely,

Susan Tave Zelman
Superintendent of Public Instruction

Tips 
and Activities

- ✓ Talk about the lives of earlier generations of your family and help your child to see connections between family stories and historical events taking place at the same time.
- ✓ Hang a map of North America on your child's wall and play games locating countries, states, the Great Lakes, mountains and rivers.
- ✓ Watch news programs together and look for stories related to the United States government. Help your child to understand the issue being discussed and the branch of government that is involved.
- ✓ Identify products in your home that come from places in North America. Find those places on a map. Talk about why products might be made or grown in that place and how they reached Ohio. For example, oranges are grown in Florida and California. They often come to Ohio by truck.
- ✓ Help your child to be aware of examples of economic activity around you every day such as the competition between two grocery stores causing lower prices, or the competition for tickets to popular sporting events causing the ticket price to increase.

Note: Some of the tips and activities in this guide were derived from "parent tips" posted on the Web sites of Georgetown County School District in South Carolina (www.gcsd.k12.sc.us) and Chelsea Publishing House (www.teachervision.com). These resources were used with permission of the authors whom we gratefully acknowledge.

Additionally, the Department would like to thank the Ohio Muskingum Valley Educational Service Center for assisting the Department with this publication.



Citizenship Rights and Responsibilities

What this means: Preparing to become active citizens.

- Explain how a person becomes a U.S. citizen (birth or naturalization).
- Explain the duties of upholding the U.S. Constitution including obeying laws, paying taxes, serving on juries and registering for selective service.
- Explain the importance of the rights that are protected by the First Amendment including freedom of religion, freedom of speech, freedom of the press, and right of petition and assembly.



Social Studies Skills and Methods

What this means: Collecting information, organizing it and using it to make decisions.

- Get information from a variety of print and electronic sources and judge its reliability, including how accurate the facts are and the expertise of the person or group providing the information.
- Locate information in a variety of sources using key words, related articles and cross-references.
- Read information critically in order to identify the author, the author's perspective and the purpose.
- Compare points of agreement and disagreement among sources.
- Organize key ideas by taking notes that paraphrase or summarize.
- Communicate research findings using line graphs and tables.
- Use a problem-solving/decision-making process which includes:
 - a) Identifying a problem;
 - b) Gathering information;
 - c) Listing and considering options;
 - d) Considering advantages and disadvantages of options;
 - e) Choosing and implementing a solution;
 - f) Developing criteria for judging its effectiveness;
 - g) Evaluating the effectiveness of the solution.

Language Arts



Acquisition of Vocabulary

What this means: Being able to recognize clues in reading, ask questions, listen and converse with adults and peers.

- Use word origins to figure out the meaning of unknown words and phrases.
- Identify the connotation (the attitude and/or feelings associated with a word) and denotation (the literal meaning of a word) of new words.
- Determine the meaning of words using dictionaries, thesauruses, glossaries, technology or footnotes.
- Understand new uses of words such as similes and metaphors.



Reading Process – Concepts of Print, Comprehension Strategies and Self-Monitoring Strategies

What this means: Understanding the basic concepts and the meaning of different types of print materials.

- Establish and adjust a purpose for reading (e.g., to find out, to interpret, to enjoy, to solve problems).
- Summarize important information in written work and know that there may be many important ideas rather than just one main idea.
- Use graphic organizers (lists, brainstorming, charts, webbing, etc.) to interpret reading material.
- Read books for different purposes such as for enjoyment, to gain information or to perform a task.



Reading Applications – Informational, Technical and Persuasive Text

What this means: Reading, understanding, explaining and critiquing different kinds of written materials such as magazines, essays, maps and Internet sites.

- Use chapter titles, headings and subheadings, indexes, tables of content and search engines on the Internet to locate information.
- Understand cause and effect in informational reading material.
- Examine information in maps, charts, tables, graphs and diagrams.
- Know the difference between fact and opinion.
- Summarize main ideas and the details that support the main idea.



Reading Applications – Literary Text

What this means: Organizing and interpreting results through collecting data to answer questions and solve problems, show relationships and make predictions about different types of literature (e.g., fables, tales, short stories).

- Explain how the thoughts, words and interactions of a character tell his or her motives.
- Explain how the setting (time, location) influences the selection.
- Explain what defines different kinds of writing such as poetry, drama, myths, biographies, autobiographies, fiction and non-fiction.
- Identify and explain figurative language in reading material such as idioms, similes, metaphors, hyperboles and personification.



- Explain why competition among consumers/buyers results in higher product prices.



Government

What this means: Understanding why government is necessary and how it works.

- Explain major responsibilities of each of the three branches of the United States government.

Check your understanding: **Three Branches of U.S. Government**



- Legislative branch:** Makes the laws and is headed by Congress.
Executive branch: Carries out/enforces laws made by Congress and is headed by the president.
Judicial branch: Interprets and applies the law and is headed by the Supreme Court.

- Explain the traits of American democracy including:
 - a) The people are the source of the government's authority;
 - b) All citizens have the right and responsibility to vote and influence the decisions of the government;
 - c) The government is run by the people or through elected representatives;
 - d) The powers of the government are limited by law;
 - e) Basic rights of people are guaranteed by the Constitution.
- Explain the importance of the Declaration of Independence and the United States Constitution.

Check your understanding: **Specialization, Capital Goods and Division of Labor**

Specialization: The production of fewer kinds of goods and services than are consumed.

Example: One person might specialize in painting houses for a living. That person would probably not grow all of his own food or make his own clothing. Instead, he would use the money made from painting houses to purchase food and clothing.

Capital good: A productive resource needed to produce goods and services.

Example: Capital goods include buildings, machinery, equipment and tools.

Division of labor: The separation of the total work required to produce a good or service into individual tasks.

Example: On an automobile assembly line each person does one task instead of building an entire car.

- Explain the relationship between supply, demand and price in a market.

Check your understanding: **Supply and Demand**

Supply: The amount of a good or service that producers are willing and able to provide at various prices during a certain time period.

Example: The amount of sweet corn in Ohio is greatest in the late summer when local farmers are able to harvest it.

Demand: The amount of a good or service that consumers are willing and able to buy at various prices during a given time period.

Example: People buy more cars when dealers have sales. The demand for cars is greater during sales.

- Explain why competition among producers/sellers results in lower costs and prices, higher quality of a product and better customer service.

Check your understanding: **Idioms, Similes, Metaphors, Hyperboles and Personification**

Idiom: An idiom is a way of speaking natural to native speakers of a language (e.g., “bad hair day,” “brownie points”).

Simile: Comparing two unlike things using “like” or “as” (e.g., The boy ran *like* the wind).

Metaphors: Comparing two unlike things using the verb “to be” (e.g., The girl’s memory *is* foggy).

Hyperbole: A figure of speech that uses an exaggeration (e.g., I have told you a *million* times).

Personification: A figure of speech in which human qualities are given to an animal, object or idea. (e.g., They live in a *happy house*).



Writing Processes

What this means: Using the steps of prewriting, drafting, revising and editing to publish different types of writing.

- Create writing ideas by talking to others and using printed material. Keep a list of writing ideas.
- Develop a purpose (e.g., to inform, to entertain) and audience for writing.
- Use strategies like rough outlines, brainstorming and lists to plan writing.
- Vary simple, compound and complex sentences.

Check your understanding: **Simple, Compound and Complex Sentences**

Simple: She played checkers.

Compound: She played checkers, and she ate a snack.

Complex: The girl, whose name is Mary, likes to play board games.

- Proofread writing and edit it for grammar and spelling.
- Prepare for publication writing (e.g., for display or sharing with

others) that follows a format appropriate to the purpose. Use techniques such as electronic resources and graphics to enhance the final product.

Writing Applications

What this means: Learning about, using and choosing appropriate words for different kinds of writing, from letters to scientific reports, and for different audiences.

- Write responses to novels, stories or poems to show understanding by using examples and evidence from the reading material.
- Write letters that state a purpose, make a request or give a compliment. Use business letter format.
- Write informational essays or reports, including research, that have a clear introduction, body and conclusion. Include facts and important details to show important ideas.
- Produce informal writings such as messages, journals or notes.

Writing Conventions


What this means: Understanding and applying punctuation, grammar and spelling rules.

- Spell contractions (e.g., don't, can't, aren't) correctly.
- Use roots, (e.g., **play** is the root of **playing**), suffixes (e.g., **played**, **hiking**, **wishful**) and prefixes (e.g., **reconsider**, **misunderstand**).
- Use commas, end marks, apostrophes and quotation marks correctly.
- Use adverbs.

Check your understanding: **Adverbs** 

Adverbs: Words that modify a verb.

He drove **slowly**.
He moved **quickly**.
She felt **badly**.

Check your understanding: **Renewable, Nonrenewable and Flow Resources** 

Renewable resources: A natural resource that can be regenerated if used carefully (e.g., fish, timber).
Nonrenewable resource: A finite natural resource that cannot be replaced once it is used (e.g., petroleum, minerals).
Flow resources: A resource that is neither renewable nor nonrenewable, but must be used when or where it occurs (e.g., running water, sunlight, wind).

- Explain how different environments affect human activities in North America.
- Study the positive and negative outcome of human changes to the environment such as Great Lakes navigation, highway systems, irrigation, mining and introduction of new species.

Economics

What this means: Understanding how to make decisions in our economic system.

- Explain that people in all economies must answer the following fundamental (basic) questions of:
 - a) What to produce?
 - b) How to produce it?
 - c) For whom to produce it?
- Explain how education, specialization, capital goods and the division of labor affect the ability to produce goods and services.




- Describe the waves of immigration to North America and where the people came from in each wave.

Geography

What this means: *Identifying the location of places, understanding how places are connected and how human activity affects them.*

- Use coordinates of latitude and longitude to determine the exact location of points in North America.

Check your understanding: **Latitude and Longitude** 

Columbus, Ohio is located at 40° north latitude and 83° west longitude. That means that the city is 40 degrees north of the equator and 83 degrees west of the Prime Meridian.

- Use maps to identify the location of:
 - a) The three largest countries of North America;
 - b) The 50 states of the United States;
 - c) The Rocky and Appalachian mountain systems;
 - d) The Mississippi, Rio Grande and St. Lawrence rivers;
 - e) The Great Lakes.
- Compare the landforms, climates, population, culture and economic traits of places in North America.
- Explain how climate is influenced by the earth-sun relationship, landforms and vegetation.
- Use maps to describe the patterns of renewable, nonrenewable and flow resources in North America including forests, fertile soil, oil, coal and running water.

- Use prepositions and prepositional phrases. (e.g., in front of, beneath, behind, on top of).
- Use objective and nominative case pronouns. Nominative case pronouns include such pronouns as *I, she, he, we, they* and *who*. Objective case pronouns include pronouns such as *me, her, him, us, them* and *whom*.

Research

What this means: *Knowing how to gather information in all subjects using different kinds of tools (books, computers, magazines, etc.) and communicate what is found.*

- Choose a topic for research that is either assigned or is one of personal interest, come up with open-ended questions and develop a plan for gathering information.
- Locate sources and collect information from several sources such as school library catalogs, online databases and electronic resources.
- Define plagiarism and cite sources of information.
- Use different ways of communicating such as oral (spoken), visual or written to present information.

Communication: Oral and Visual

What this means: *Delivering presentations on different topics for different types of audiences.*

- Show active listening skills such as asking questions or making eye contact.
- Understand the main idea and draw conclusions from presentations.
- Use clear diction (speech) and tone (sound), and change the volume and tempo (speed) to stress ideas.
- Give presentations that:
 - a) Show an understanding of the topic, events or ideas in logical order;
 - b) Support the main idea with facts, details, examples, quotations, statistics and/or stories;

- c) Include a clear introduction, body and conclusion;
- d) Use visuals;
- e) Use and name several different sources.

Tips and Activities

- ✓ While you are looking at pictures of the family and your child, ask your child to explain what is happening in the pictures. Put baby pictures and other pictures of your child in order from birth to present. Have your child tell about the pictures.
- ✓ Understanding root words gives us clues about the meanings of words. Have your child read a passage from his or her reader. Find words that have prefixes or suffixes, or inflectional endings such as *s*, *ed* or *ing*. Have your child copy the word, then color the prefix, suffix or inflectional ending with a yellow crayon. What is remaining will be the root word.
- ✓ Compound words are two words put together to make one word such as *driftwood* and *driveway*. Choose a dozen compound words. Write the first part of the compound word on blue index cards. Write the second part on white index cards. Have your child match the first and second halves to make compound words. Can he or she tell you what the word means? Ask him or her to write sentences with the words.
- ✓ To understand a story, readers must figure out the order in which events occur. Help your child look for time and order words such as *first*, *then*, *finally*, *next*, *when* and *the day before*. To practice this skill, have your child read a passage, then list the events in the order that they occurred. Copy these events on sentence strips or long paper, mix the sentences, then have the child put them in order again.
- ✓ Graphs, charts and maps help readers better understand information by providing a picture representation of details from the story. Skim through a daily newspaper and locate an example of a chart or map. Help your child understand the chart or map and talk about it.

Social Studies



Focus: Regions of North America

History

What this means: *Understanding the pattern of events that have happened in the past.*

- Make timelines and identify possible relationships between events.
- Explain how American Indians settled the continent and why different nations of Indians interacted with their environment in different ways.
- Explain why European countries explored and colonized North America.
- Describe the lasting effects of the colonies built by the Spanish, French and English in North America, including patterns that can be seen today such as language, food, traditions and architecture.
- Explain how the United States became independent from Great Britain.
- Explain how settlement, industrialization and transportation affected the expansion (growth) of the United States.

People in Societies

What this means: *Identifying both similarities and differences in the traditions of various groups of people.*

- Compare the traditions of groups of people living in North America, including their art, religion, language, food, clothing and shelter.
- Compare life on Indian reservations today with the cultural traditions of American Indians before the reservation system.
- Describe the experiences of African-Americans under the institution of slavery.



Scientific Ways of Knowing

What this means: Learning how to think scientifically and understand how people have shaped the study and practice of science.

- Summarize how conclusions and ideas change as new knowledge is gained.
- Support findings by coming up with descriptions, explanations and models.
- Explain why an experiment must be repeated by different people or at different times or places and show the same results before the results are accepted.
- Identify how scientists use different kinds of continuous investigations depending on the questions they are trying to answer.

Tips and Activities

- ✓ Visit a zoo and take time to read the display information about the animals. Observe the behavioral and physical characteristics of the animals.
- ✓ Get involved in a community project with your child that focuses on caring for the environment (e.g., recycling, cleaning up litter, planting trees).
- ✓ When you see a living creature on a walk, on television or in a book or movie, classify it as an amphibian, mammal, bird, reptile, fish, insect or crustacean. If you are not sure of a particular creature's category, research it together in a directory, encyclopedia or animal book.
- ✓ Observe the moon together over several weeks; note whether you are looking at it at the same time every day or at different times. Note the moon's location and draw its various shapes; be aware of the stars around it. Examine the moon chart in the weather section of your daily newspaper or on a calendar.

Mathematics



Numbers, Number Sense and Operations

What this means: Using number sense and number skills, from basic counting to paper and pencil calculations, to age-appropriate use of calculators and computers.

- Use different forms of “one” to show how fractions are equal.

Check your understanding: **Show How Fractions are Equal** ✓

$$18/24 = 9/12 \times 2/2 = 3/4 \times 6/6$$

- Determine equal forms of fractions, decimals and percents (e.g., $1/2 = .5 = 50\%$).
- Round decimals to a given place value and round fractions to the nearest half.

Check your understanding: **Rounding Decimals and Fractions** ✓

Round .77 to the nearest tenth = .8
Round $7/8$ to the nearest half = 1

- Recognize and identify perfect squares and their roots (e.g., $64 = 8 \times 8$ and $25 = 5 \times 5$).
- Use order of operations, including parentheses, to simplify problems.



Check your understanding: **Order of Operations**



Mathematicians agree that order of operations is the order of performing several operations in evaluating a numerical expression.

1. Do all operations within parenthesis;
2. Simplify expressions involving exponents;
3. Multiply and divide from left to right;
4. Add and subtract in order from left to right.

Example: $2 + (5 - 1) \times 3$
 $2 + 4 \times 3$
 $2 + 12$
 14

Note: Students will not be expected to simplify expressions involving exponents in grade five.

- Understand why fractions need common denominators to be added and subtracted.
- Add and subtract commonly used fractions with like (e.g., $\frac{2}{4} + \frac{1}{4}$) and unlike (e.g., $\frac{2}{5} - \frac{3}{6}$) denominators.
- Represent and compare numbers less than 0 by extending the number line and using familiar applications (e.g., temperature, owing money).
- Estimate the results of computations involving whole numbers, fractions and decimals using various strategies.



Measurement

What this means: Making accurate measurements using the appropriate tools, terms and technology.

- Use the appropriate units to measure angles (e.g., degrees).
- Know the difference between covering the faces (surface area) and filling the inside of (volume) three-dimensional objects.
- Know the difference between linear (e.g., measuring perimeter), square (e.g., measuring area) and cubic (e.g., measuring volume) units.



Science and Technology

What this means: Understanding the relationship between science and technology to design and construct devices to solve problems.

- Explore positive and negative effects of human activity and technology on the environment.
- Review a design that already exists and has been used to solve a problem based on the review of peers.
- Explain how the solution to one problem might create other problems.



Scientific Inquiry

What this means: Using scientific processes to ask questions, conduct investigations, gather, analyze and communicate information.

- Choose and safely use the correct tools to collect data when conducting investigations and sharing findings with others (e.g., thermometers, timers, balances, scales, magnifiers).
- Evaluate observations and measurements made by other people and tell why there might be any differences (discrepancies).
- Use evidence and observations to explain results of investigations.
- Identify one or two variables in a simple experiment.

Check your understanding: **Identifying Variables in an Experiment**



Examples of variables in an experiment could include temperature, speed, wind, weight, length, height or time of day.

- Identify the potential hazards and/or precautions involved in an investigation.

Check your understanding: **Changes in an Ecosystem**



Examples of changes in an ecosystem include:

Beaver ponds, earthworm burrows, grasshoppers eating plants, people planting and cutting trees, and people introducing new species are all examples of changes in an ecosystem.



Physical Sciences

What this means: Understanding physical systems, concepts and properties of matter, energy, forces and motion.

- Define temperature as the measure of thermal energy and describe the way it is measured.
- Trace how thermal energy can transfer from one object to another by conduction.

Check your understanding: **Conduction**



Conduction is the process by which heat or electricity is transmitted through a material or body without movement of the material or body (e.g., the heat conducted from a stove top through the pan to the food).

- Describe that an electrical current in a circuit can produce thermal energy, light, sound and/or magnetic forces.
- Trace how an electrical current travels by creating a simple electric circuit.
- Summarize observations of the transmission, reflection and bending of light.
- Summarize the observations of the transmission, reflection and absorption of sound.
- Describe that the changing rate of vibration can change the pitch of a sound.



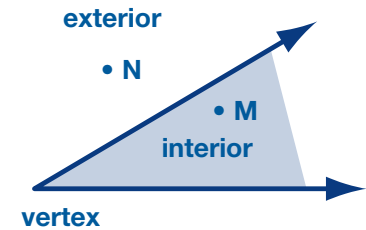
- Develop formulas to find the perimeter and area of a triangle, rectangle and parallelogram, and the volume of rectangular prisms.
- Use benchmark angles (e.g., 45° , 90° , 120°) to estimate the measure of angles and use a tool to measure and draw angles.



Geometry and Spatial Sense

What this means: Identifying, classifying and analyzing one-, two- and three-dimensional objects, understanding their properties and using that knowledge to solve problems.

- Label the vertex, rays and interior and exterior points of an angle. An angle consists of two different **rays** that have the same initial point. The rays are the sides of the angle. The point common to two sides of the angle is the **vertex** of the angle.



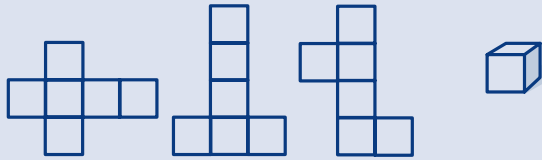
A point is in the **interior** of an angle if it is between points that lie on each side of the angle.

A point is in the **exterior** of an angle if it is not on the angle or in its interior.

- Use properties of congruent figures (having the same shape and size) to solve problems.
- Show a further understanding of coordinate systems to include points whose x or y values are negative.
- Be able to tell what three-dimensional object will result from folding a two-dimensional net (a two-dimensional shape that can be folded into a three-dimensional figure).

Check your understanding: **Nets**

The following represents what three-dimensional object will result from folding a two-dimensional net:



Patterns, Functions and Algebra

What this means: Representing patterns and relationships using tables, graphs and symbols, and using them to solve problems.

- Use calculators or computers to develop patterns and generalize (or simplify) them using tables or graphs.
- Create and understand the meaning of equations and inequalities to represent mathematical situations.

Check your understanding: **Equations and Inequalities**

Equations: Mathematical expressions that are *equal* to each other; e.g., $y = 5x$ or $x + 3 = 9$

Inequalities: Mathematical expressions that are *unequal* to each other; e.g., $7 > 3$ or $x > 2$

- Use materials, visuals, models, graphs and tables to draw conclusions and predict what will happen.
- Describe how the quantitative (related to amount) change in a variable affects the value of a related variable.

Check your understanding: **What is a Producer?**

Producer: A producer is any organism (such as a green plant) which produces its own organic compounds from simple precursors (like carbon dioxide) and many of which are sources of food for other living things.

- Explain how almost all kinds of animals' food can be traced back to plants.
- Trace the organization of simple food chains and food webs (e.g., herbivores, carnivores, omnivores, decomposers).

Check your understanding: **Food Chains and Food Webs**

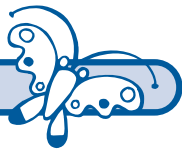
Herbivore: Plant-eating animal.

Carnivore: Flesh-eating animal.

Omnivore: Flesh and plant-eating animal.

Decomposer: Organisms such as bacteria or fungi that feed on and break down dead organisms, returning parts of organic substances to the environment.

- Summarize that organisms can only survive in ecosystems where their needs (e.g., food, water, shelter, air, carrying capacity and waste disposal) can be met. The world has different kinds of ecosystems that support different kinds of organisms.
- Show how an organism's behavior patterns are related to that organism's ecosystem, including:
 - a) The kinds and numbers of other living things present;
 - b) What kinds of food and resources are available;
 - c) Changing (physical) traits of the ecosystem.
- Study how all organisms, including humans, cause changes in their ecosystems, and how these changes can be good, bad or neutral.



Earth and Space Sciences

What this means: Understanding the interconnected cycles and systems of the universe, solar system and Earth.

- Explain how night and day are caused by the Earth's rotation.
- Explain that Earth is one of several planets to orbit the sun, and that the moon orbits Earth.
- Describe the characteristics of Earth and its orbit about the sun.

Check your understanding: **Earth's Characteristics**



- Three-fourths of the Earth's surface is covered by a layer of water.
 - The entire planet is surrounded by a thin blanket of air.
 - The Earth has an elliptical orbit (a flattened circle).
 - The Earth has a tilted axis.
 - The Earth is a spherical planet.
- Explain that stars are like the sun, some being smaller and some larger, but they are so far away that they look like points of light.
 - Explain how the supply of resources that cannot be reused in its current form can be extended by reducing, recycling and reusing what is used, but cannot be extended forever.
 - Explore ways Earth's renewable resources such as fresh water, air, wildlife and trees can be maintained.



Life Sciences

What this means: Understanding the structure and function of living systems and how they interact with the environment.

- Describe the role of producers in the transfer of energy entering ecosystems such as plants converting sunlight to chemical energy through photosynthesis.

Check your understanding: **Quantitative Amounts**



Describe how the rate of growth changes over time based upon data in a table or graph.

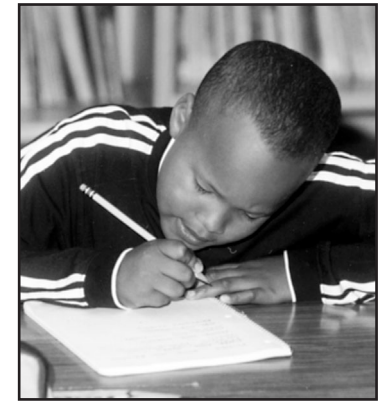
- Use variables when writing general rules for patterns.



Data Analysis and Probability

What this means: Organizing and interpreting results through data collection to answer questions, solve problems, show relationships and make predictions.

- Understand increasingly complex displays of data such as double bar graphs.
- Decide on the appropriate type of data to be collected to answer questions from the teacher or students; collect and display the data and communicate what was found.
- Change or modify original conclusions and be able to explain new interpretations (understandings) as more data is collected.
- List and explain all the possible outcomes in a given situation.



Check your understanding: **Counting Possible Outcomes**



Tell the number of possible outfits from 3 shirts, 2 shorts and 2 pairs of shoes.

- Tell the probability of events within a simple experiment such as three chances out of eight.
- Use range, median and mode, and explain what each does and does not explain about a set of data.

Check your understanding: **Range, Median and Mode** ✓

Range: The range is the difference between the least number and the greatest number.

Median: The median is the middle number in a set of numbers placed in order from least to greatest.

Mode: The number that appears the most often in a listing of numbers.

1, 2, 2, 3, 4, 5, 6: 3 = the median; 2 = the mode;
5 = the range (6-1)

- Compare what should happen (theoretical/expected results) with what did happen (experimental/actual results) in a simple experiment. For example, in tossing a coin, the theoretical probability is $\frac{1}{2}$. In an experiment of tossing a coin five times, heads came up five times in a row.
- Tell what will happen based on experimental and theoretical probabilities.



Mathematical Processes

What this means: *Applying problem-solving and reasoning skills and communicating mathematical ideas.*

- Use more than one strategy to solve unfamiliar and non-routine problem situations.
- Use representations to organize and communicate mathematical thinking in making conjectures and supporting arguments.

Tips and Activities

- ✓ Have your child lift a variety of household objects and identify the best weight unit in both standard and metric systems. For example, a kitchen spoon would be measured in ounces or grams and a chair in pounds or kilograms.
- ✓ Ask your child questions requiring conversions that relate to things they see or experience on a regular basis. For example, “It is _____ miles to your school. How many feet (or yards) would that be? This bag of sugar weighs 80 ounces. How many pounds is that?”
- ✓ Together, make an appropriate graph of the color of cars and makes of cars in a parking lot or on your street. Try it several different times. Based on the data shown in your graph, make generalizations about what you might find if you continued your observations.
- ✓ Create problems such as “Bill ran 50 yards in 12 seconds. How many feet did he run per second?”
- ✓ Search through newspapers and magazines for lists, tables and graphs containing numerical information. Find specific information and ask your child to locate it. For example, ask “What percent of the students like pizza for lunch?”