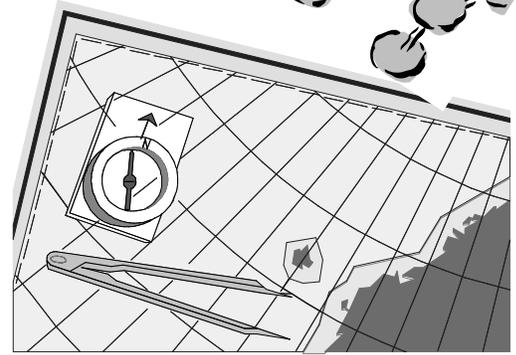
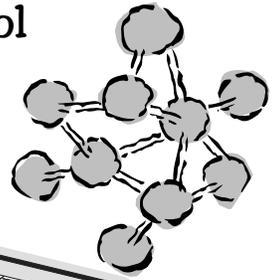


# 5th Grade Curriculum Parent Guide

Raymond School



## Welcome to Fifth Grade

Curriculum performance standards were developed for each grade level that will lead students to specific eighth grade academic goals. By the end of grade eight, students will read and respond to a wide range of writing to build an understanding of written materials, of themselves, and of others.

In the language arts, students will learn to read, interpret, and critically analyze literature; read and discuss literary and nonliterary texts to understand human experiences; read to acquire information; and create or produce writing to communicate with different audiences for a variety of purposes. Students will plan, revise, edit, and publish clear and effective writing; understand the function of various forms, structures, and punctuation marks of standard improving communication in American English and use them appropriately in communications. Students will learn to orally communicate information, opinions, and ideas effectively to different audiences for a variety of purposes. They will participate effectively in discussions and develop their vocabulary and ability to use words, phrases, idioms, and various grammatical structures as a means of improving communication. They will recognize and interpret various uses and adaptations of language in social, cultural, regional, and professional situations, and learn to be flexible and responsive in their use of English.

Students will also use computers to acquire, organize, analyze, and communicate information; make informed judgments about media and products; create media products appropriate to audience and purpose; demonstrate a working knowledge of media production and distribution; and analyze and edit media work as appropriate to audience and purpose. Students will conduct research and inquiry on self-selected or assigned topics, issues, or problems and use an appropriate form to communicate their findings.

In social studies, students gain geographical perspectives on the world by studying the earth and the interactions of people with places where they live, work and play. Knowledge of geography helps students to address the various cultural, economic, social and civic implications of life in earth's many environments. In Wisconsin schools, the content, concepts and skills related to geography may be taught in units and courses that deal with geography, history, global studies, anthropology, sociology, psychology, current events and world religions.

Students will learn about the history of Wisconsin, the United States and the world, examining change and continuity over time in order to develop historical perspective, explain historical relationships and analyze issues that affect the present and the future. Reconstructing and interpreting historical events provides a needed perspective in addressing the past, the present and the future. Students will learn about political science and acquire the knowledge of political systems necessary for developing individual civic responsibility by studying the history and contemporary uses of power, authority and governance. Students in will learn about production, distribution, exchange and consumption so that they can make informed economic decisions.

Students in Wisconsin will learn about the behavioral sciences by exploring concepts from the discipline of sociology,

the study of the interactions among individuals, groups and institutions; the discipline of psychology, the study of factors that influence individual identity and learning; and the discipline of anthropology, the study of cultures in various times and settings. Learning about the behavioral sciences helps students to understand people in various times and places. By examining cultures, students are able to compare our ways of life and those of other groups of people in the past and present.

Students in Wisconsin will draw upon a broad body of mathematical knowledge and apply a variety of mathematical skills and strategies, including reasoning, oral and written communication and the use of appropriate technology, when solving mathematical, real-world and non-routine problems. In order to participate fully as a citizen and a worker in our contemporary world, a person should be mathematically powerful. Mathematical power is the ability to explore, to conjecture, to reason logically and to apply a wide repertoire of methods to solve problems. People use numbers to quantify, describe and label things in the world around them. It is important to know the many uses of numbers and various ways of representing them. Number sense is a matter of necessity, not only in one's occupation but also in the conduct of daily life, such as shopping, cooking, planning a budget or analyzing information provided by the media.

Students will be able to use geometric concepts, relationships and procedures to interpret, represent and solve problems. Geometry and its study of shapes and relationships is an effort to understand the nature and beauty of the world.

Students will also select and use appropriate tools (including technology) and techniques to measure things to a specified degree of accuracy. They will use measurements in problem-solving situations. Measurement is the foundation upon which much technological, scientific, economic and social inquiry rests. Dramatic advances in technology have launched the world into the Information Age, where data are used to describe past events or predict future events. Whether in the business place or in the home, as producers or consumers of information, citizens need to be well versed in the concepts and procedures of data analysis in order to make informed decisions.

Students discover, describe and generalize simple and complex patterns and relationships. In the context of real-world problem situations, the student will use algebraic techniques to define and describe the problem to determine and justify appropriate solutions.

## Language Arts

### Reading/Literature

- Use sentence and word structure, word origins, visual images, and context clues to understand unfamiliar words and clarify text
- Use visual features of texts such as headings and bold print, and structures of texts such as chronology and cause-and-effect, to improve comprehension
- Establish reading and writing habits by using texts to find information, gain understanding of diverse viewpoints, make decisions, and enjoy reading
- Select, summarize, paraphrase, analyze, and evaluate, orally and in writing, passages of texts chosen for specific purposes
- Use context clues to identify meaning of selected words
- Identify root words, prefixes, and suffixes with specific functions
- Use sentence structures to clarify text and unfamiliar words
- Identify number of syllables in selected words
- Use visual images to preview and clarify new text
- Use dictionaries to look up pronunciations and meanings of words
- Use headings, bold face print, and chronology to aid comprehension
- Use texts to find information and understand diverse viewpoints
- Select, summarize, and paraphrase passages, orally and in writing
- Use headings, bold print, pictures, and graphics to aid comprehension
- Establish reading and writing habits through positive modeling by adults
- Identify the defining features and structure of literary texts such as conflict, representation of character, and point of view

- Analyze the effect of character, plot, setting, language, topic style, purpose, and point of view on the overall impact of literature
- Draw on a broad base of knowledge about the genres of literature, such as the structure and conventions of essays, epics, fables, myths, plays, poems, short stories, and novels, when interpreting the meaning of a literary work
- Develop criteria to evaluate literary merit and explain critical opinions about a text, informally in conversation or formally in a well-organized speech or essay
- Discuss characteristics of fables, myths, plays, poems, short stories, and novels
- Evaluate characters as protagonists and/or antagonists
- Identify conflict, symbolism, moral, character, rhyme, rhythm, similes, metaphors, onomatopoeia, and characters' point of view
- Discuss conflict, character, and character point of view on overall impact of literature
- Skim and scan for main idea, supporting details and sequence of events
- Explain and summarize setting, plot, characters, problem, main event, and resolution
- Categorize fact and opinion statement based on story elements
- Discuss criteria for analyzing fact and opinion
- Explain opinions and evaluate text orally and in writing
- Identify author's purpose and point of view
- Identify figurative language (see appendix)
- Provide interpretive responses, orally and in writing, to literary and nonliterary texts representing the diversity of American cultural heritage and cultures of the world
- Identify common historical, social, and cultural themes and issues in literary works and selected passages
- Draw on a broad base of knowledge about the themes, ideas, and insights found in classical literature while reading, interpreting, and reflecting on contemporary texts
- Evaluate the themes and main ideas of a world considering its audience and purpose
- Identify prejudice in literary and nonliterary texts
- Provide oral and written responses to prejudice
- Identify and evaluate common historical, social and cultural themes
- Apply background knowledge when analyzing human experiences
- Identify creation themes in Native American folk tales
- Compare and contrast history and historical fiction
- Interpret and use resources such as charts, tables, schedules, timelines, and manuals in paper and electronic form
- Analyze and evaluate the accuracy and usefulness of information from different sources
- Explain information and main ideas in informational passages
- Distinguish facts found in documents, narratives, charts, maps, and other sources
- Generalize and interpret information acquired for one's purposes
- Identify and explain information, main ideas, and organization in informational passages
- Distinguish facts in documents, narratives, charts, maps, tables and other sources and the generalizations and interpretations drawn from them
- Use charts, tables, schedules, and timelines in paper and electronic form
- Identify, compare, contrast, and summarize facts found in charts, tables and other sources
- Compare and contrast the accuracy and usefulness of information from different sources
- Identify and explain cause and effect and comparison and contrast patterns
- Identify information and main ideas in informational passages
- Compare and contrast similar selections

## Writing

- Write a coherent and complete expository piece, with sufficient detail to fulfill its purpose, sufficient evidence to support its assertions, language appropriate for its intended audience, and organization achieved through clear coordination and subordination of ideas
- Write a well-organized persuasive piece that includes a clear position, a discernible tone, and a coherent argument with reliable evidence
- Write a well-organized narrative based on experience that uses descriptive language and detail, presents a sequence of events, and reveals a theme
- Write clear and pertinent responses to verbal or visual material that communicate, explain, and interpret the reading or viewing experience to a specific audience

- Write creative fiction that includes major and minor characters, a coherent plot, effective imagery, descriptive language, and concrete detail
- Write in a variety of situations and adapt strategies, such as revision, technology, and the use of reference materials, to the situation
- Use a variety of writing technologies including pen and paper as well as computers
- Write for a variety of readers, including peers, teachers, and other adults, adapting content, style, and structure to audience and situation
- Understand the characteristics of expository writing such as detail, purpose, evidence, language, audience, and organization
- Select a piece of expository writing and compare and contrast it to another style of writing
- Write a three-paragraph expository piece with detail to fulfill its purpose
- Understand the characteristics of persuasive writing such as a clear position and a coherent argument with evidence
- Select a persuasive writing piece and compare and contrast it to another style of writing
- Write a persuasive letter with a clear position and three coherent arguments to support it
- Write a personal narrative in correct sequence with a beginning, middle and end
- Write narrative pieces with sufficient detail and descriptive language
- Summarize responses to verbal or visual material that communicate, explain, into different audience
- Write creative fiction with major characters, a basic plot, detail, and descriptive language
- Write in timed and untimed situations for different purposes and audiences using technology and reference materials
- Write using pencil and paper as well as technology
- Produce multiple drafts, including finished pieces, that demonstrate the capacity to generate, focus, and organize ideas and to revise the language, organization, content, and tone of successive drafts in order to fulfill a specific purpose for communicating with a specific audience
- Identify questions and strategies for improving drafts in writing conferences with a teacher
- Given a writing assignment to be completed in a limited amount of time, produce a well developed, well organized, and effective response in correct English and an appropriate voice.
- Produce drafts and finished pieces that generate and organize ideas and revise language, organization, and content
- Identify revisions for improving drafts in writing conferences with a teacher
- Produce a well-developed organized response in a limited time
- Understand the function of words, phrases, and clauses in a sentence and use them effectively, including coordinate and subordinate conjunctions, relative pronouns, and comparative adjectives
- Use correct tenses to indicate the relative order of events
- Understand and employ principles of agreement, including subject-verb, pronoun-noun, and preposition-pronoun
- Punctuate compound, complex, and compound-complex sentences correctly
- Employ the conventions of capitalization
- Spell frequently used words correctly and use effective strategies for spelling unfamiliar words
- Use relative pronouns and comparative adjectives
- Understand and use words, phrases, and clauses
- Use word tense to indicate the order of events
- Use subject-verb and pronoun-noun agreement
- Punctuate compound and complex sentences
- Employ the conventions of capitalization
- Spell words correctly and use strategies to spell unfamiliar words
- subordinating conjunctions are so, although, after, because, if,

## Oral Language

- Share impromptu remarks on a given topic at appropriate times
- Present an organized and detailed oral report using note cards
- Perform readings of prose, poetry, and drama
- Use effective voice variations while role-playing
- Interview family members to gain information
- Use encyclopedias, almanacs, dictionaries, indexes, and search engines
- Organize and present a report on differing viewpoints
- Differentiate between formal and informal contexts
- Use appropriate eye contact, volume, rate, and articulation

- Use appropriate etiquette when expressing thanks and receiving praise
- Use prior knowledge to debate an issue
- Use a speaking style appropriate to audience and purpose
- Appropriately express thanks without teacher cues
- Summarize and explain the information conveyed in an oral communication, accounting for the key ideas, structure, and relationship of parts to the whole
- Distinguish among purposes for listening, such as gaining information or being entertained, and take notes as appropriate
- Recall significant details and sequence accurately
- Follow a speaker's argument and represent it in notes
- Evaluate the reliability of information in a communication, using criteria based on prior knowledge of the speaker, the topic, and the context and on analysis of logic, evidence, propaganda devices, and language
- Identify the key ideas presented in a listening experience
- Recall details from a listening experience
- Differentiate whether oral information is presented to entertain, persuade, or inform
- State the differing points of view in a debate or argument
- Identify propaganda devices present in oral communications
- Participate in discussion by listening attentively, respecting the opinions of others, and responding responsibly and courteously to the remarks of others
- Explain and advance opinions by citing evidence and referring to sources
- Evaluate the stated ideas and opinions of others, seeking clarification through questions
- Invite ideas and opinions of others into the discussion, responding clearly and tactfully to questions and comments
- Accept and use helpful criticism
- Establish and maintain an open mind when listening to others' ideas and opinions
- Summarize the main points of a discussion, orally and in writing, specifying areas of agreement and disagreement and paraphrasing contributions
- Display and maintain facial expressions, body language, and other response cues that indicate respect for the speaker and attention to the discussion
- Attend to the content of discussion rather than the speaker
- Participate in discussion without dominating
- Distinguish between supported and unsupported statements
- Listen attentively to a discussion
- Distinguish fact from opinion
- Listen to the ideas of others and ask appropriate questions
- Encourage and involve others in discussion
- Listen to constructive criticism from a variety of sources
- Listen respectfully to the ideas and opinions of others
- Summarize the main points of a discussion in writing
- Display appropriate facial expressions during a discussion
- Understand the importance of listening to the content of a discussion
- Take turns speaking in a discussion
- Begin to understand the concepts of supported and unsupported statements

## Language

- Consult dictionaries, thesauruses, grammar texts or handbooks when choosing words and phrases in written language.
- Use synonyms and antonyms to enhance language.
- Use words to inform, explain, and persuade.
- Use context clues to understand oral and written language.
- Understand the literal and interpretive meaning of idioms (examples: folktales/poetry).
- Use similes, metaphors and personification.
- Identify alliteration, onomatopoeia, and other figurative language.
- Differentiate between true and false statements and change false statements into true statements.
- Understand the difference between formal and informal language.
- Write a demonstration speech using directions, chronological order, and appropriate technical words.
- Use daily writing to inform, explain, persuade, and compare and contrast.
- Write appropriately with formal or informal language.

## Media and Technology

- Use basic word processing functions including copy, cut, paste; centering; single and double spacing; tab indent; style functions.
- Write rough draft, revise and finalize (ex. Inspiration).
- Use a spell checker correctly.
- Identify data base: define fields and data.
- Locate on-screen help in word processing programs.
- Identify key words, use basic search engines and demonstrate efficient Internet navigation.
- Examine selected resources for pertinent information, determine validity and authority.
- Recognize common structural features found in print and broadcast advertising.
- Identify and explain the use of stereotypes and biases evident in various media.
- Compare the effect of particular symbols and images seen in various media.
- Develop criteria for selecting or avoiding specific broadcast programs and periodicals.
- Compare and contrast features of print and non-print resources (including electronic).
- Identify personal criteria for selecting materials and/or broadcast programs.
- Identify stereotypes in various forms of media.
- Identify and interpret symbols in various forms of media.
- Make use of written and/or oral reviews and evaluations from teachers and peers.
- Write informational articles that target audiences of a variety of publications.
- Use desktop publishing to produce products such as brochures and newsletters designed for particular organizations and audiences.
- Create video and audio tapes designed for particular audiences.
- Create media products (including both written and technology-enhanced)
- Identify audience and purpose of media product
- Select appropriate format
- Plan a promotion or campaign that involves broadcast and print media production and distribution.
- Analyze how messages may be affected by financial factors such as sponsorship.
- Identify advertising strategies and techniques aimed at teenagers.
- Identify advertising strategies and techniques aimed at teenagers (DARE program).
- Cooperatively create and broadcast weekly announcements (for example: via intercom).
- Revise media productions by adding, deleting, and adjusting the sequence and arrangement of information, images, or other content as necessary to improve focus, clarity, or effect.
- Develop criteria for comprehensive feedback on the quality of media work and use it during production.
- In groups, identify the criteria to be used, assess the product and determine ways to improve presentation (ex. story board, inspiration).

## Research & Inquiry

- Identify problem or question, review prior knowledge, determine focus and questions.
- Determine audience and purpose of presentation.
- Identify relevant print, non-print and electronic resources, using keywords or phrases.
- Differentiate between primary and secondary sources.
- Select appropriate resources and locate information with increasing independence.
- Analyze and evaluate information found in graphs, charts, maps and tables.
- Develop and use note-taking strategies, record information, and develop a bibliography.
- Organize and evaluate information to summarize findings.
- Evaluate information and use relevant information to solve problems or answer questions.
- Select presentation format and develop product.
- Evaluate product according to predetermined criteria and determine ways to improve.

## Social Studies

### Geography

- Interpret and use different types of maps that show major events in the historical development of our country.
- Create a map of different regions of the United States applying principles of latitude and longitude.
- Use data and variety of symbols and colors to create thematic graphs of different regions of the United States.

- Develop mental maps of regions of the United States that demonstrate understanding of relative location, direction, size and shape.
- Draw an accurate map from memory to answer questions about the location of physical and human made features.
- Construct mental and actual maps of the routes followed by individual explorers in the European discovery of America.
- Use an atlas to estimate distance and calculate scale.
- Examine, interpret and analyze historical data on land use, settlement patterns and ecosystem changes in Wisconsin communities with similarly sized localities in another region of the United States.
- Use tables and graphs to observe and interpret trends and relationships in the availability and use of natural resources in different regions of the United States.
- Develop a list of places in the world that Americans depend on for imported resources and manufactured goods.
- Describe the physical development of an area such as the Hawaiian Islands and predict how current natural phenomenon will impact the future of the area.
- Compare and contrast agriculture between two regions.
- List and describe recreational opportunities in physical environments situated in different regions of the United States.
- Describe how people create places that reflect cultural values and ideas as they build neighborhoods, shopping centers, industrial parks and schools. For example what does “skyscraper” infer about the physical make-up and values of large urban centers?
- Explain how technology is changing agriculture in the Midwest region of the United States and how these changes affected the growth of urban areas.
- Develop timelines, maps and graphs to describe how changing transportation and communication technology has affected relationship between different regions.
- Explain how isolated communities have been changed by technology (e.g., new highways, satellite dishes, and computers).
- Analyze newspaper and magazine articles to identify geographic issues and problems identified in the articles.
- Ask questions about geographic problems within a particular region related to traffic, the environment, land use and housing, then summarize these problems by preparing written or oral statements, maps and graphs.

## History

- Use historical thinking and analysis of various primary sources including documents, letters, diaries, artifacts and eyewitness accounts of European exploration to evaluate their credibility.
- Employ cause-and-effect arguments to demonstrate how significant events have influenced the past and the present in United States and world history
- Discuss the importance of improvement in maritime technology in worldwide exploration in the 15th and 16th century.
- Compare English, French and Dutch motives for exploration with those of the Spanish.
- Explain how events in Europe encourage exploration and colonization of the Americas.
- Explain the importance of the voyages of discovery of Christopher Columbus and Ferdinand Magellan to future explorations.
- Explain differing viewpoints on why Sir Francis Drake should be considered a hero or a pirate.
- Identify the features of the Constitution, which have made this the most enduring and widely imitated written Constitution in world history.
- Assess the importance of the individual in history.
- Evaluate the significance of explorers’ journeys and their interactions with indigenous people.
- Explain how major technological innovations influences farming, mining, ranching, and other industries. For example, hydraulic engineering and barbed wire.
- Describe the impact of European exploration and colonization of North America on Native American populations.
- Define and apply the concept of indigenous people to other states and regions.
- Differentiate between, locate and use primary and secondary sources such as computer software, interviews, biographies, print and visual material as well as artifacts to acquire information about the early history of our country.

## Political Science and Citizenship: Power, Authority, Governance and Responsibility

- Describe the purpose of government and how its powers are acquired, used and justified.
- List and describe the rights and responsibilities of citizenship in our republic.
- Identify fundamental values and principles in important American documents such as the Declaration of Independence, Preamble to the U.S. Constitution, the Bill of Rights, Pledge of Allegiance, and other speeches, songs, and stories.
- Illustrate how a bill becomes a law at the state and national level.

- Describe the powers and responsibilities of each of the three branches of government under the Constitution.
- Define federalism and separation of power.
- Illustrate how each branch of government can check the powers of the other branches.
- Explain how specific provisions of the United States limit the powers of government in order to protect the rights of individuals.
- Identify the major political parties in our system of government.
- Describe the concept and role of citizenship in our democratic republic.
- Evaluate, take and defend positions on the importance of voluntarism in American society.
- Define public policy and identify examples at local, state and national levels.
- Explain how people exercise their authority for or against certain rules, laws, or candidates such as by voting in local elections, attending public meetings and writing letters.
- Discuss the meaning and purpose of an international organization (e.g. Red Cross and Johnstown flood).

### **Economics:: Production, Distribution, Exchange, Consumption**

- Distinguish between supply and demand and explain their impact on European exploration of the Americas.
- Give examples of scarcity in their (student) own lives, as well as in the community and different regions of the central states.
- Gather and interpret economic information about different regions of the United States.
- Recognize that productive resources including natural (land), human (labor) and human made (capital) are used in the production of goods and services.
- Explain the role of government regulations and its impact on the American Revolution.
- Identify the major economic regions in the Americas and explain how later systems changed them.
- Use resource maps of the United States regions to locate and generalize on potential economic impact of identified material.
- Use resource maps of different regions of the United States to locate natural resources and develop a generalization of their potential economic impact.
- Discuss the motivation by investors in joint stock companies to establish colonies in the Americas.
- List and discuss factors that have contributed to workers productivity and efficiency.

### **The Behavioral Sciences: Individuals, Institutions and Society**

- Describe how personal experiences and prior learning help shape images of regions or place.
- Compare and contrast the cultures and associated lifestyles of different immigrant groups in two regions of the United States.
- Compare and contrast differing sets of ideas, values, beliefs, personalities and institutions by identifying likenesses and differences in selected ethnic cultures.
- Identify and Trace the origins of ethnic celebrations.
- Identify and describe how cultures pass values, beliefs and traditions to the next generation.
- Generalize on reasons why regions change or maintain specific traditions and customs.
- List and describe the major social institutions in the United States (for example, Boy Scouts, Girl Scouts, 4-H, Lions Club, United Way, etc.).
- Use demographic data from different regions of the United States to compare information about the age and/or of its citizens and predict trends during the next two decades (e.g., Post World War II people retiring).
- Examine and explain stereotypes used to describe people from different states or regions such as “flatlanders,” “cheeseheads” and “hillbillies.”
- Explain the point of view or purpose of a media message focusing on one or more regions of the United States.
- Discuss how media can influence what you think and do.
- Define and differentiate between race and ethnicity.
- List songs associated with specific regions and identify the kinds of images projected in the music.
- Describe the impact of large Indian Reservations on the social and economic conditions in the United States, for example Arizona and South Dakota.
- Examine designed objects from different cultures found in two regions of the United States, such as furniture or clothing to become familiar with what is unique about each culture.
- Investigate the types of assistance that was given by individuals, groups and government to the victims of natural disasters such as the Johnstown flood and Hurricane Andrew.

# Science Connections

**Science Themes:** Develop their understanding of the science themes by using the themes to frame questions about science-related issues and problems.

- Define and explain how the following science themes can be applied to the natural world: systems (body systems), order (path of energy in food chain), organization (periodic table), and interactions (ecosystems); evidence (data), models (mini habitats) and explanations (lab write-ups); constancy (tides, water cycle), change (weather patterns), and measurement (temperature); evolution (plant succession), equilibrium (heart rate and exercise), and energy (light, sound, etc).

**Science Systems and the Themes:** Describe limitations of science systems and give reasons why specific science themes are included in or excluded from those systems.

- Describe limitations of science systems and give reasons why specific science themes are included in or excluded from those systems (i.e. data collection from an ecosystem can be limited by cost, time, technology and knowledge).

**Defending and Critiquing Explanations:** Defend explanations and models by collecting and organizing evidence that supports them and critique explanations and models by collecting and organizing evidence that conflicts with them.

- Discuss the characteristics of a good explanation (use supporting evidence) and why models are used (i.e., economical and practical, less dangerous).

**Evidence:** Collect evidence to show that models developed as explanations for events were (and are) based on the evidence available to scientists at the time.

- Know that models developed as explanations for events were (and are) based on the evidence available to scientists at the time, (i.e., the model of the atom).

**New Evidence:** Show [include the following themes when showing] how models and explanations, based on systems, were changed as new evidence accumulated (the effects of constancy, evolution, change, and measurement should all be part of these explanations).

- Understand that models will change over time as new evidence is collected.

**Predicting with Models and Explanations:** Use models and explanations to predict actions and events in the natural world.

- Use models and/or explanations to predict actions and events in the natural world (i.e., predict the effect of introducing a new species into ecosystem, zebra mussels and plant life in lake, predict what happens when you take one element out of a food chain).

**Models:** Design real or thought investigations to test the usefulness and limitations of a model.

- Work as a group to identify the usefulness and limitations of a model (i.e., discuss limitations of a land biome model, terrariums, sound wave model (slinky)).

**Predicting with Themes:** Use the themes of evolution, equilibrium, and energy to predict future events or changes in the natural world.

- Use the themes of evolution, equilibrium, and energy to predict future events or changes in the natural world (i.e., effects of climate changes on ecosystems).

## Nature of Science

**Science Knowledge and Concepts:** Describe how scientific knowledge and concepts have changed over time in the earth and space, life and environmental and physical sciences.

- Describe how scientific knowledge and concepts have changed over time in the physical science (i.e., natural light to artificial light, naturally occurring elements to man made elements).

**Change Over Time:** Identify and describe major changes that have occurred over time in conceptual models and explanations in the earth and space, life and environmental, and physical sciences and Identify the people, cultures, and conditions that led to these developments.

**Rules of Science:** Explain how the general rules of science apply to the development and use of evidence in science investigations, model-making, and applications.

- Understand that the rules of science require us to use data without changing data to meet expected outcomes.

**Reasoning:** Describe types of reasoning and evidence used outside of science to draw conclusions about the natural world.

- Work as a group to identify examples of non-scientific reasoning being used to draw conclusions about the natural world (i.e., mythology, astrology).

**Application of Science Knowledge:** Explain ways in which scientific knowledge is shared, checked, and extended, and show how these processes change over time.

- Understand that much of today's scientific knowledge is based on previous scientific ideas that have changed over time (i.e., model of atom).

**Uses and Limitations of Science:** Explain the ways in which scientific knowledge is useful and also limited when applied to social issues.

- Understand how scientific knowledge can be useful for making legislative decisions concerning pollution, recycling programs, introduction of foreign plants and animals into our country, etc.

## Science Inquiry

**Questioning:** Identify questions they can investigate using resources and equipment they have available.

- Working as a group, students will identify the questions they hope to answer while conducting their experiments.

**Data and Information Sources:** Identify data and locate sources of information including their own records to answer the questions being investigated.

- Use the data collected during investigations to develop conclusions and report findings.
- Make inferences and draw conclusions when given data from a study.

**Conducting Investigations:** Design and safely conduct investigations that provide reliable quantitative or qualitative data, as appropriate, to answer their questions.

- Design and complete a science fair project that includes the elements of a scientific study.

**Inferences:** Use inferences to help decide possible results of their investigations, [and] use observations to check their inferences.

- Understand what inferences are.

**Explaining Results:** Use accepted scientific knowledge, models, and theories to explain their results and to raise further questions about their investigations.

- Review a completed investigation and determine how the data supported the results.

**Relating Inferences from Investigations:** State what they have learned from investigations, relating their inferences to scientific knowledge and to data they have collected.

- Students will understand and give examples of inferences.

**Explaining Conclusions:** Explain their data and conclusions in ways that allow an audience to understand the questions they selected for investigation and the answers they have developed.

**Using Technology:** Use computer software and other technologies to organize, process, and present their data.

- Use computer software and other technologies to organize, process, and present their data (Power Point, Inspiration, Excel, internet, etc.).

**Defending Validity:** Evaluate, explain, and defend the validity of questions, hypotheses, and conclusions to their investigations.

- Share and defend data from an investigation with peers and teacher.

**Realizing the Importance of Implications:** Discuss the importance of their results and implications of their work with peers, teachers, and other adults.

- Discuss the importance of data collected from investigations and its connections to real life situations.

**Further Questioning:** Raise further questions which still need to be answered.

- Working as a group, raise further questions about investigations which still need to be answered.

## Physical Science

**Physical and Chemical Properties:** Observe, describe, and introduce physical and chemical properties of elements and other substances to identify and group them according to properties such as melting points, boiling points, conductivity, magnetic attraction, and reactions to common physical and chemical tests.

- Identify the characteristics of chemical and physical changes and give examples of each.
- Know that matter is made up of small particles called atoms.
- Know that certain atoms combine to form molecules.

**Chemical Interactions (Changes):** Use the major ideas of atomic theory and molecular theory to describe physical and chemical interactions among substances, including solids, liquids, and gases.

- Know the three states of matter.

- Understand that substances can exist as different states of matter.
- Identify physical and chemical changes among substances.
- Illustrate the structure of an atom (nucleus, proton, neutron, electron).
- Know the terms atom, molecule, element and compound and be able to give examples of each.
- Give examples of chemical changes.

**New Substances:** Understand how chemical interactions (change) and behaviors lead to new substances with different properties.

- Identify examples of chemical and physical changes/interactions.
- Know that when a chemical change takes place a new substance is made.

**Explaining Interactions:** While conducting investigations, use the science themes to develop explanations of physical and chemical interactions and energy exchanges.

- Carry out investigations of physical and chemical interactions, using the scientific rules (i.e., mystery solutions.)

**Explaining Motion:** While conducting investigations, explain the motion of objects using concepts of speed, velocity, acceleration, friction, momentum, and changes over time, among others, and apply these concepts and explanations to real-life situations outside the classroom

- This standard is not addressed at this grade level.

**Using Definitions and Ideas:** While conducting investigations of common physical and chemical interactions occurring in the laboratory and the outside world, Use commonly accepted definitions of energy and the idea of energy conservation.

- Give examples of different forms of energy.
- Give examples that the transfer of energy (i.e., through the consumption of food) and explain why this is essential to all living organisms.
- Know the organization of simple food chains and food webs and understand that energy is being transferred.

**Interactions of Objects:** Describe and investigate the properties of light, heat, gravity, radio waves, magnetic fields, electrical fields, and sound waves as they interact with material objects in common situations.

- Explain and give examples of light, gravity, radio waves, electric fields and sound waves.
- Identify sources of light, gravity, radio waves, and sound waves.
- Explain how light waves and sound waves travel.
- Know how the reflection, absorption and transmission of light affects an object's appearance.
- Know how flat and curved mirrors affect light.

**Models of Energy Transmission:** Explain the behaviors of various forms of energy by using the models of energy transmission, both in the laboratory and in real-life situations in the outside world.

- Explain and give examples of different forms of energy (sound, light, heat).
- Give examples of energy changing forms.
- Know an example of an ocean and land food chain.
- Demonstrate that the pitch of a sound depends on the frequency of the vibration producing it.

**Models of Atomic Structure:** Explain how models of the atomic structure of matter have changed over time, including historical models and modern atomic theory.

- Identify and build a model of the current atomic structure (electron cloud theory).
- Create a timeline showing how models of atomic structure have changed over time.
- Use periodic table to compare and build models of elements.
- Know how elements are on the periodic chart.
- Know that symbols represent atoms, atoms combine to form molecules and that a chemical formula is used to illustrate a chemical reaction.

## **Earth and Space Science**

**Changes in Earth Features:** Using the science themes, explain and predict changes in major features of land, water, and atmospheric systems.

- Explain and give examples of major land features (i.e. biomes or topography), and weather changes.
- Know how air flow and air pressure affects weather.
- Know that most of the Earth's surface is covered by water, that most of that water is salt water in oceans and that fresh water is found in rivers, lakes, underground sources and glaciers.
- Explain that air is a substance that surrounds us and takes up space.
- Know that wind is the movement of the air that surrounds us.

**Underlying Structures of the Earth:** Describe underlying structures of the earth that cause changes in the earth's surface.

- Identify and describe structures on the inside of the earth.

**Forces Acting on the Earth:** Using the science themes during the process of investigation, describe climate, weather, ocean currents, soil movements and changes in the forces acting on the earth.

**Influence of Living Organisms:** Using the science themes, analyze the influence living organisms have had on the earth's systems, including their impact on the composition of the atmosphere and the weathering of rocks.

- Explain the role of decomposing organisms in the nitrogen cycle.

**Evidence of Earth History:** Analyze the geologic and life history of the earth, including change over time, using various forms of scientific evidence.

- Explain the role of decomposing organisms in the nitrogen cycle.

**Use of Resources:** Describe through investigations the use of the earth's resources by humans in both past and current cultures, particularly how changes in the resources used for the past 100 years are the basis for efforts to conserve and recycle renewable and non-renewable resources.

- Give examples of current and past use of earth resources.

**Celestial Models:** Describe the general structure of the solar system, galaxies, and the universe, explaining the nature of the evidence used to develop current models of the universe.

- Explain the role of decomposing organisms in the nitrogen cycle.

**Cycles of the Earth:** Using past and current models of the structure of the solar system, explain the daily, monthly, yearly, and long-term cycles of the earth, citing evidence gained from personal observation as well as evidence used by scientists.

- Explain the role of decomposing organisms in the nitrogen cycle.

## **Life and Environmental Science**

**Structure and Function of Living Things:** Understand the structure and function of cells, organs, tissues, organ systems, and whole organisms.

- Explain the function of the respiratory and circulatory systems of the human body.

**Adaptation Structures:** Show how organisms have adapted structures to match their functions, providing means of encouraging individual and group survival within specific environments.

- Define adaptation.
- Give examples of adaptations in different organisms.

**Internal and External Regulation:** Understand that an organism is regulated both internally and externally.

- Understand that a healthy lifestyle is important for the internal regulation of our respiratory and circulatory system (i.e., understand harmful effects of smoking, drugs or unhealthy lifestyle).

**Population Balance:** Show through investigations how organisms both depend on and contribute to the balance or imbalance of populations and/or ecosystems, which in turn contribute to the total system of life on the planet.

- Define populations and ecosystems.
- Define and give examples of life cycles.
- Give examples of populations affecting (positive and negative) each other in an ecosystem.
- Distinguish between producers and consumers.
- Know the interdependence of a food chain and give examples of food chains.
- Know how energy flows through food chains and food webs.

**Changes that Impact the Survival and Growth of Certain Species:** Explain how some of the changes on the earth are contributing to changes in the balance of life and affecting the survival or population growth of certain species.

- Give examples of how changes in our environment have impacted on living things.

**Human Influence on the Environment:** Project how current trends in human resource use and population growth will influence the natural environment, and show how current policies affect those trends.

- Give examples of influence that humans have on the natural environment.
- Explain how nature and people affect a food web.

## **Science Application**

**Careers:** Identify and investigate the skills people need for a career in science or technology and identify the academic courses that a person pursuing such a career would need.

- Identify careers that involve science and technology.

- Identify skills one would need to have a career in a science field (i.e., making observations, strong sense of inquiry, patience, analyzing data, collecting information, communication skills, understanding tools and technology).

**Influence of Discoveries:** Explain how current scientific and technological discoveries have an influence on the work people do and how some of these discoveries also lead to new careers.

- Identify scientific and technological discoveries through discussion of current events.
- Discuss how scientific and technological discoveries have influenced careers (i.e., environmental science, space research, forensics, research, computer programming, transplant technology, gene therapy, water treatment, sanitation, bridge construction).

**Impact of Science and Technology:** Illustrate the impact that science and technology have had, both good and bad, on careers, systems, society, environment, and quality of life.

- Identify and explain positive and negative effects science and technology have had on society (i.e., faster pace, longer life expectancy, accessibility, invasion of privacy, loss/increase of jobs, organization, opportunities, internet usage, impact on environment, energy sources, energy consumption and costs).

**Science Models/Machines:** Propose a design (or re-design) of an applied science model or a machine that will have an impact in the community or elsewhere in the world and show how the design (or re-design) might work, including potential side effects.

- Design applied science models or machines and explain how they could affect society (i.e., egg drop, design temperature control {insulation} containers, structural design, landscape design, living habitat design).

**Science or Technology Solutions:** Investigate a specific local problem to which there has been a scientific or technological solution, including proposals for alternative courses of action, the choices that were made, reasons for the choices, any new problems created, and subsequent community satisfaction.

- Identify local scientific or technological problems and their solutions.
- Investigate processes (methods) by which problems were solved.
- Analyze solutions and problems associated with the solutions.
- Impact of residential expansion.

**Discoveries Result in New Technology:** Use current texts, encyclopedias, source books, computers, experts, the popular press, or other relevant sources to identify examples of how scientific discoveries have resulted in new technology.

- Gather information, using a variety of current and reliable resources, to identify scientific discoveries which have resulted in new technologies (Science in the News activity). (i.e., genetics and cloning, pacemakers, velcro, genetic engineering, laser eye surgery.)

**Science and Technology Interdependence:** Show evidence of how science and technology are interdependent, using some examples drawn from personally conducted investigations.

- Define technology.
- Describe how science and technology are interdependent

## Science in Social and Personal Perspectives

**Evidence in Media:** Evaluate the scientific evidence used in various media (for example, television, radio, Internet, popular press, and scientific journals) to address a social issue, using criteria of accuracy, logic, bias, relevance of data, and credibility of sources.

- Analyze scientific evidence from various media sources or social issues.
- Identify scientific and technological discoveries through discussion of current events.
- Recognize what makes a source reliable.

**Scientific Solution:** Present a scientific solution to a problem involving the earth and space, life and environmental, or physical sciences and participate in a consensus-building discussion to arrive at a group decision.

- Identify scientific problems and possible solutions.
- Participate in class discussions regarding a local (school) environmental problem and potential solutions.
- Participate in the practice of reaching a consensus regarding a scientific solution to a problem.

**Consequences of Decisions on Health and Safety:** Understand the consequences of decisions affecting personal health and safety.

- Define consequences of decisions affecting personal health and safety (i.e., environmental consequences).
- Identify choices and consequences regarding personal health and safety (i.e., DARE and guidance program).
- Participate in the Science Safety Unit.

# MATH

## Mathematical Processes

- Use reasoning abilities to:
  - perceive patterns (congruent, similar, divisibility, L.C.M., G.C.F., prime factorization, comparing and ordering, sequence)
  - identify relationships
  - evaluate information (too much, not enough, what do you need to use).
- Use reasoning abilities to:
  - design questions that will help with further research
  - justify a statement using logical reasoning by explaining processes used to arrive at the answer
  - test reasonableness of results through estimation
  - to defend work by using the four-step process (explore, plan, solve, examine)
- Apply the following problem-solving strategies:
  - choose an operation
  - use manipulatives
  - make a chart/table/list
  - work backwards
  - use a calculator
  - find a pattern
  - Venn diagram
  - draw a diagram
  - guess and check
  - use estimation
  - note important information
  - identify needed/extra information
  - use a graph
- Justify strategies and solutions through oral and written explanations.
- Communicate logical arguments clearly to show why a result makes sense using words, numbers, pictures, symbols, charts, graphs, tables, diagrams, models.
- Know when to use the appropriate resource/strategy.
- Justify logical arguments through oral and written explanation.
- Analyze non-routine problems by illustrating, guessing, simplifying, relating to everyday life.
- Use mathematics as a way to understand other areas of the curriculum (e.g. measurement in science, geography skills in social studies, and Venn diagrams in language arts)
- See relationships between various kinds of problems and actual events.
- Develop effective oral and written presentations that include:
  - appropriate use of technology
  - the conventions of mathematical discourse (e.g., symbols, definitions, labeled drawings)
  - mathematical language
  - clear organization of ideas and procedures
  - understanding of purpose and audience
- Exercise and apply what they know in written form by using a journal.
- Calculators – a learner will apply the following: in problemsolving; as a tool for computing; reading a display; number/operation keys; fraction calculators.
- Computers – a learner will apply the following: spreadsheet tool; graphing tool; geometry tool; internet access.
- The learner will determine when technology is appropriate and when other approaches are more appropriate or efficient.
- Present results of a project, written and oral, to an audience.
- Communications – The learner will explain and demonstrate mathematical concepts, procedures and ideas to others by reading, talking about it, sharing and assisting others.
  - think/pair/share
  - study buddies
  - peer tutoring
  - cooperative groups
- Curriculum connections: social studies/history/geography; health/physical education; science; music; language arts; art.
- Real-world connections: the learner will use real-world connections as they apply in daily life, careers, as consumers and in multi-cultural situations.

## Number Operations and Relationships

- Read and write whole numbers to hundred billions.
- Symbolically rename numbers using standard and expanded forms to millions.

- Read, write and demonstrate decimals to thousandths.
- Read, write and demonstrate fractions
- Read, write and demonstrate percents.
- Identify and be able to place numbers on a number line.
- Recall multiplication and division facts 0-10.
- Add and subtract whole numbers up to six digits.
- Evaluate addition, subtraction, multiplication and division expressions.
- Find the least common multiples of two or three numbers.
- Find products of two and three digit factors.
- Divide by two digit divisors.
- Subtracting decimals and adding decimals.
- Multiply decimals through thousandths.
- Multiply money amounts.
- Add and subtract fractions (like and unlike denominators).
- Add and subtract mixed numbers; regroup.
- Multiply and divide fractions.
- Introduce numerical expressions using order of operations.
  - Introduce zeros as place value holders in decimals (adding, subtracting, dividing).
- Apply and use equivalent fractions.
- Apply and use fractions in simplest form.
- Apply and use mixed numbers and whole numbers as fractions.
- Apply and use an equivalent decimal for a fraction.
- Introduce a probability ratio.
- Apply and use a percent as a fraction and vice versa.
- Order whole numbers and decimals using  $<$ ,  $>$ ,  $=$ .
- Compare and order fractions using  $<$ ,  $>$ ,  $=$ .
- Apply proportional thinking in a variety of problem situations that include, but are not limited to:
  - ratios and proportions (e.g., rates, scale drawings\*, similarity\*)
  - percents including those greater than 100 and less than one (e.g., discounts, rate of increase or decrease, sales tax)
- Use estimation.
- Express a percent as a fraction or decimal.
- Express a fraction or decimal as a percent.
- Express a probability ratio for a situation involving equally likely events.
- Model and solve problems involving number-theory concepts such as:
  - prime and composite numbers
  - divisibility and remainders
  - greatest common factors
  - least common multiples
- Construct the prime factorization of a composite number.
- Use divisibility rules for 2, 3, 5, 6, 10.
- Be introduced to the greatest common factor of two or more numbers.
- Be introduced to the least common multiple of two or more numbers.
- Be introduced to dividing by two-digit divisors.
- Be introduced to dividing a whole number by a whole number with a decimal quotient.
- Use equivalent fractions.
- Add and subtract fractions and mixed numbers.
- In problem-solving situations, select and use appropriate computational procedures with rational numbers such as:
  - calculating mentally
  - estimating
  - using technology (e.g., scientific calculators, spreadsheets)
- Use front-end estimation and rounding when appropriate.
- Problem solve by making notes or using data from graphs.
- Explore estimation and when to use it.
- Follow order of operations.

- Choose a computation method.
- Estimate using compatible numbers.
- Explore capabilities and terminology of a basic function calculator.
- Estimate “as between” two numbers.
- Express fractions as decimals by using a calculator.
- Estimate to nearest whole number before adding, subtracting, multiplying or dividing.
- Problem solving strategies:  
Classify information, guess and check, use a graph, make a table, determine reasonable answers, use a formula, solve a simpler problem, choose the method of computation, make a list, eliminate possibilities, find a pattern, use logical reasoning, draw a diagram, make a model, work backward, use an equation and not enough information is present.

## Geometry

- Describe special and complex two- and three-dimensional figures (e.g., rhombus, polyhedron, cylinder) and their component parts (e.g., base, altitude and slant height) by:
  - naming, defining and giving examples
  - comparing, sorting and classifying them
  - identifying and contrasting their properties (e.g., symmetrical, isosceles, regular)
  - drawing and constructing physical models to specifications
  - explaining how these figures are related to objects in the environment
- Identify and draw points, line segments, line rays, perpendicular lines, parallel lines, and intersecting lines.
- Use a protractor to draw and measure angles (e.g., acute, obtuse and right angles).
- Describe and classify angles and triangles (equilateral, isosceles, scalene, acute, obtuse and right).
- Identify and classify polygons (three-sided through n-sided).
- Construct polygons with a specified number of sides.
- Identify and draw congruent, similar and symmetrical figures.
- Construct and identify the parts of a circle including diameter and radius.
- Construct three-dimensional objects and investigate by counting their faces, edges and vertices.
- Analyze, select and present examples of two and three-dimensional figures in real-life settings.
- Identify and use relationships among the component parts of special and complex 2-and 3-dimensional figures (e.g., parallel sides, congruent faces).
- Explain that a polygon must have congruent sides and congruent angles to be a regular polygon.
- Analyze and calculate the sum of three angles of a triangle.
- Construct three-dimensional objects and investigate by counting their faces, edges and vertices.
- Identify 3-dimensional shapes from 2-dimensional perspectives and draw 2-dimensional sketches of 3-dimensional objects preserving their significant features.
- Draw and construct cubes, pyramids and prisms.
- Perform transformations on 2-dimensional figures and describe and analyze the effects of the transformations on the figures.
- Transform 2-dimensional figures.
- Identify how a figure was transformed (e.g., slides, flips or turns).
- Investigate congruence of a figure to its slide, flip and turn images.
- Explore tessellations.
- Locate objects using the rectangular coordinate system.
  - Employ technology to demonstrate the rectangular coordinate system when grade appropriate.
- Identify ordered pairs using the rectangular coordinate system (ordered pairs in the first quadrant).
- Locate and examine points on a map using a grid system.

## Measurement

- Find area of regular figures located in the classroom.
- Estimate area of regular figures using a grid and geoboards.
- Determine appropriate tools and accurately measure length and mass.
- Explain the process and results in steps 2 and 3 to the class.
- Demonstrate understanding of basic measurement facts, principles and techniques including the following:
  - approximate comparisons between metric and US customary units (e.g., a liter and a quart are about the same; a kilometer is about six-tenths of a mile.)

- knowledge that direct measurement produces approximate, not exact, measures.
- the use of smaller units to produce more precise measures.
- employment of appropriate grade level technology.
- Recognize and understand metric and customary units of measure.
- Demonstrate that each unit of measurement is part of another either smaller or larger unit.
- Construct a model to understand that direct measurement produces approximate, not exact, measures (i.e. construct an average fifth grader).
- Determine measurement directly using standard units (metric and US customary) with these suggested degrees of accuracy:
  - lengths to the nearest mm or 1/16 of an inch
  - weight (mass) to the nearest 0.1 g or 0.5 ounce
  - liquid capacity to the nearest ml
  - angles to the nearest degree
  - temperature to the nearest Centigrade and Fahrenheit degree
  - elapsed time to the nearest second
- Determine measurements to the following degrees of accuracy:
  - length to the nearest eighth, quarter, half-inch, foot, yard, millimeter, centimeter, meter
  - weight to the nearest ounce, pound, gram, and kilogram
  - temperature to the nearest degree in Celsius and Fahrenheit
  - time to the nearest second
  - liquid capacity to the nearest ounce, cup, pint, quart, half-gallon, gallon, milliliter, liter, and fluid ounce
  - angles to the nearest degree.
- Determine appropriate units to measure length, mass, temperature, capacity and time.
- Apply measurement skills to real life problems.
- Determine measurements indirectly using:
  - estimation
  - conversion of units within a system (e.g., quarts to cups, millimeters to centimeters)
  - ratio and proportion (e.g., similarity, scale drawings)
  - geometric formulas to derive lengths, areas, volumes of common figures (e.g., perimeter, circumference, surface area)
  - the Pythagorean relationship
  - geometric relationships and properties for angle size (e.g., parallel lines and trans-versals; sum of angles of a triangle, vertical angles)
- Convert customary units:
  - capacity (fluid ounce, cup, pint, quart, gallon)
  - weight (ounce, pound, and ton)
  - length (inches, feet, yards and miles)
- Convert metric units:
  - capacity (liters, kiloliters)
  - weight (grams, kilograms)
  - length (millimeters, centimeters, meters, kilometers)
- Apply measurement skills to real-life problems.

## Statistics and Probability

- Work with data in the context of real-world situations by:
  - formulating questions that lead to data collection and analysis
  - designing and conducting a statistical investigation
  - using technology to generate displays, summary statistics and presentations
- Collect, organize and record real-world data.
- Conduct surveys, experiments or simulations and display results.
- Formulate questions and determine the appropriate data to collect and how to collect data.
- Draw reasonable conclusions about real-world data.
- Organize and display data from statistical investigations using:
  - appropriate tables, graphs and/or charts (e.g., circle, bar, or line, for multiple sets of data)
  - appropriate plots (e.g., line, stem-and-leaf, box, scatter)
- Make a simple bar graph, double bar graph, circle graph and line graph.

- Construct a simple line plot.
- Create story problems based on collected data for classmates to solve.
- Extract, interpret and analyze information from organized and displayed data by using:
  - frequency and distribution, including mode and range
  - central tendencies of data (mean and median)
  - indicators of dispersion (e.g., outliers)
- Predict and calculate the mean, median, mode and range from a set of data.
- Analyze information based on frequency and distribution.
- Assess and select the appropriate scale and interval for graphs or frequency tables.
- Solve data problems by extracting, interpreting, and analyzing data.
- Use the results of data analysis to:
  - make predictions
  - develop convincing arguments
  - draw conclusions
- Predict and draw conclusions from data.
- Analyze data from simple line, bar, and circle graphs.
- Apply results of the data analysis to solve problems.
- Construct and present arguments to support analysis and display of data.
- Compare several sets of data to generate, test, and, as the data dictate, confirm or deny hypotheses.
- Formulate a hypothesis from an actual set of data.
- Analyze the data to determine the criteria that makes the hypothesis true or false.
- Evaluate the data for accuracy.
- Summarize the data on charts and graphs.
- Evaluate presentations and statistical analysis from a variety of sources for:
  - credibility of the source
  - techniques of collection, organization and presentation of data
  - missing or incorrect data
  - inferences
  - possible sources of bias
- Analyze techniques of organization and presentation.
- Determine if any data is missing.
- Determine the likelihood of occurrence of simple events by:
  - using a variety of strategies to identify possible outcomes (e.g., lists, tables, tree diagrams)
  - conducting an experiment
  - designing and conducting simulations
  - applying theoretical notions of probability (e.g., that four equally likely events have a 25% chance of happening)
  - employing appropriate grade level technology for presentations
- Use a variety of strategies to identify possible outcomes (lists, tables, tree diagrams.)
- Set up and conduct an experiment.
- Conduct simulations (solve problems by acting them out).

## **Algebraic Relationships**

- Work with algebraic expressions in a variety of ways, including:
  - using appropriate symbolism, including exponents and variables
  - evaluating expressions through numerical substitution
  - generating equivalent expressions
  - adding and subtracting expressions
- Use vocabulary symbols and notation of algebra correctly ( $n$ ,  $=$ ,  $<$ ,  $>$ ).
- Read, write and solve addition, subtraction, multiplication and division number sentences.
- Provide the missing number in an addition, subtraction, multiplication and division sentence.
- Evaluate expressions using order of operations.
- Evaluate numerical expressions and simple algebraic expressions through numerical substitution.
- Solve problems involving simple algebraic expressions.
- Work with linear and nonlinear patterns and relationships in a variety of ways, including:

- representing them with tables, with graphs and with algebraic expressions, equations and inequalities
- describing and interpreting their graphical representations (e.g., slope, rate of change, intercepts)
- using them as models of real-world phenomena
- describing a real-world phenomenon that a given graph might represent
- Identify and solve inequalities.
- Complete function tables.
- Recognize, describe, and analyze functional relationships by generalizing a rule that characterizes the pattern of change among variables. These functional relationships include exponential growth and decay (e.g., cell division, depreciation)
- Use linear equations and inequalities in a variety of ways, including:
  - writing them to represent problem situations and to express generalizations.
  - solving them by different methods (e.g., informally, graphically, with formal properties, with technology).
  - writing and evaluating formulas (including solving for a specified variable).
  - using them to record and describe solution strategies.
- Solve equations using mental math and the guess and check strategy.
- Solve equations involving addition, subtraction, multiplication and division of fractions/decimals.
- Solve equations by using inverse operations.
- Show the relationship between +/- functions by completing “fact family” equations.
- Use a calculator to solve equations.
- Solve problems by using a formula.
- Recognize and use generalized properties and relations, including:
  - additive and multiplicative property of equations and inequalities
  - commutativity and associativity of addition and multiplication
  - distributive property
  - inverses and identities for addition and multiplication
  - transitive property
- Recognize, use, and differentiate between the basic properties of arithmetic:
  - Order/Commutative property for  $+/x$ .
  - Zero property for  $+/x$ .
  - One/Identity Property for  $x/\div$ .
  - Inverse property for  $+/-$  and  $x/\div$  ( $12-3=9/9+3=12$ ).
  - Property of one for  $x$  and  $\div$ .
  - Associative property for  $+$  and  $x$  [ $5x(3x2)=(5x3)x2$ ].
  - Distributive property.

## Health

### Mental Emotional Health

Explain the difference between healthy behaviors and risk behaviors. Demonstrate the ability to use goal-setting and decision-making skills to enhance health. Demonstrate communication skills to build and maintain healthy relationships. Predict how decisions regarding health behaviors have consequences for self and others. Demonstrate ways to communicate care, consideration, and respect of self and others. Identify stress management strategies. Identify six suicide prevention skills to use when a person shows signs of suicide.

### Family Living

Analyze the possible causes of conflict of youth in schools and communities. Generate way to avoid and get assistance in threatening situations. Describe characteristics needed to be a responsible friend and family member. Describe how the behavior of family and peers contributes to ones physical, mental, emotional, and social health. Discuss ways family members deal with death of a family member, separation and divorce of parents, dating and remarriage, formation of a step-family, and new siblings. Weigh the balance of giving and taking in a healthful relationship. Distinguish between safe, risky, and harmful behaviors in relationships. Identify topics to include when discussing dating with parents.

### Growth and Development

List the physical changes that occur during puberty. State the function and care for the endocrine system. Explain what happens during a 28-day menstrual cycle. State the function and care of the reproductive system. Explain the process of

conception. Describe the development of the baby of the 1st, 2nd, and 3rd trimester of pregnancy. Discuss the problems that can occur during pregnancy. Explain why abstinence is the best choice for teens.

## **Nutrition**

Identify the functions of each of the six basic classes of nutrients. Illustrate The Food Guide Pyramid showing the 5 basic food groups, examples of foods in each, and the number of servings each day. Comprehend concepts related to health promotion and disease related to health promotion and disease prevention. Explain why teens need to eat a variety of food combined with physical activity. Evaluate the information that is found on a food label. Analyze the validity of health information, products, and services. Recommend suggestions how to choose healthful foods. Recognize the importance of a safe food handling/cooking and kitchen. Identify steps to use to maintain a desirable weight. Recognize the causes, symptoms, and treatment for anorexia nervosa, bulimia, and obesity. Recognize the warning signs that indicate the negative body image.

## **Personal Health**

Recognize the importance of assuming responsibility for personal health behaviors. Demonstrate ways to care for the body. Explain why regular physical activity can help with weight managements and body composition. Identify the importance of why a person needs rest and sleep. Sketch out a physical fitness plan. Illustrate types of exercise to develop physical fitness. Identify the 5 areas of Phy. Fitness Identify the components of a complete workout. Demonstrate the steps of RICE for injuries. Design a physical fitness plan using the activity pyramid. Students role-play

## **Alcohol, Tobacco, and Other Drugs**

Explain why drugs have different effects on different body actions. Analyze the information on the labels of OTC drugs and prescription drugs. Summarize the effects of alcohol on the mind including decision-making, violence, depression, and suicide. Analyze the effects of alcohol on the body. Explain how smoking affects the cardiovascular and respiratory system. Discuss smoking-related conditions and diseases. Analyze how smoking affects appearance, relationships, and spending habits. Identify ways in which tobacco ads try to encourage teens to use tobacco products. Discuss the effects of controlled drugs and illegal drug use. Explain how drug misuse and abuse progresses to drug dependence. List support programs for drug dependent, family members, and friends. Demonstrate the ability to resist drug use and abuse.

## **Communicable and Chronic Diseases**

Understand the difference between communicable and non-communicable diseases. List behaviors that reduce the risk of being infected with a communicable disease. Discuss the cause, symptoms, and treatment for sexually transmitted diseases. Distinguish between safe, risky, and harmful behaviors in relationships. Outline how you can and cannot become infected with HIV/AIDS. Explain how HIV destroys the immune system.

## **Injury Prevention and Safety**

List the protective factors that reduce the risk of violence. Discuss the kinds of violent behavior and why it is important recognize them. List anger management skills and conflict resolution skills. Explain the first aid procedures for emergency situations. Demonstrate how to perform life saving techniques. Examples are choking, rescue breathing, and CPR.

## **Consumer and Community Health**

Explain how technology/media influences the consumer. Discuss tempting appeals used in advertisements. Explain how to make a budget and why it is important. Explain why it is important to be cautious when charging products and services.

## **Environmental Health**

Analyze how environment and personal health are interrelated. Name products that can be sorted and recycled.