

SEVENTH GRADE  
Grade Level Expectations

**Mathematics Curriculum Overview**

**Number and Operations**

Student will be able to demonstrate understanding numbers, ways of representing numbers, relationships among numbers & number systems.

1. Read, write and compare numbers
2. Represent and use rational numbers
3. Compose and decompose numbers
4. Classify and describe numeric relationships

Understand meanings of operations and how they relate to one another

1. Describe effects of operations
2. Apply properties of operations
3. Apply operations on real and complex numbers

Compute fluently and make reasonable estimates

1. Compute problems
2. Estimate and justify solutions
3. Use proportional reasoning

**Algebraic Relationships**

Understand patterns, relations and functions

1. Create and analyze patterns
2. Classify objects by size or number
3. Identify and compare functions

Represent and analyze mathematical situations and structures using algebraic symbols

1. Represent mathematical situations
2. Describe and use mathematical manipulations

Use mathematical models to represent and understand quantitative relationships

Analyze change in various contexts

## **Geometric and Spatial Relationships**

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

Describe and use geometric relationships

Specify locations and describe spatial relationships using coordinate geometry and other representational systems

1. Use coordinate systems

Apply transformations and use symmetry to analyze mathematical situations

1. Use transformations on objects
2. Use transformations on functions
3. Use symmetry

Use visualization, spatial reasoning and geometric modeling to solve problems

1. Recognize and draw three- dimensional representations
2. Draw and use visual models

## **Measurement**

Understand measurable attributes of objects and the units, systems and processes of measurement

1. Determine unit of measurement
2. Identify equivalent measures
3. Tell and use units of time

Apply appropriate techniques, tools and formulas to determine measurements

1. Use angle measurement
2. Apply geometric measurements
3. Analyze precision
4. Use relationships within a measurement system

## **Data and Probability**

Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them

1. Formulate questions
2. Represent and interpret data

Select and use appropriate statistical methods to analyze data

1. Describe and analyze data
2. Compare data representations

Develop and evaluate inferences and predictions that are based on data

1. understand and apply basic concepts of probability
2. apply basic concepts of probability

### **Communication Arts - Reading Curriculum Overview**

**Develop and apply skills and strategies to the reading process**

Phonics - apply decoding strategies to independently "problem-solve" unknown words when reading & when needed

Fluency - read grade-level instructional text

1. with fluency, accuracy and expression
2. adjusting reading rate to difficulty and type of text

Vocabulary - develop vocabulary through text, using

1. roots and affixes
2. context clues
3. glossary and thesaurus

Pre-Reading - apply pre-reading strategies to aid comprehension

1. access prior knowledge
2. preview
3. predict
4. set a purpose for reading

During reading, utilize strategies to

1. determine meaning of unknown words
2. monitor comprehension
3. question the text
4. infer
5. visualize
6. paraphrase
7. summarize

Post-Reading - apply post-reading skills to comprehend, interpret, analyze, and evaluate text:

1. question to clarify
2. reflect
3. draw conclusions
4. summarize
5. paraphrase

Making Connections - compare, contrast and analyze connections:

1. text to self (text ideas and own experiences)
2. text to text (information and relationships in various fiction and non-fiction works)
3. text to world (text ideas and the world by identifying how literature reflects a culture and historic time frame)

**Develop and apply skills and strategies to comprehend, analyze and evaluate fiction, poetry & drama from a variety of cultures and times**

Text Features - interpret and

1. analyze information in title
2. recognize and interpret the text features of fiction, poetry and drama in grade-level text

Literary Techniques - identify and explain literary techniques, emphasizing

1. onomatopoeia
2. alliteration and
3. analyze literary techniques previously introduced

Literary Elements - use details from text to

1. identify plot and sub-plot, mood, flashback, theme and types of conflict
2. analyze cause and effect
3. identify and explain point of view
4. evaluate the problem-solving processes of characters and the effectiveness
5. of solutions

**Develop and apply skills and strategies to comprehend, analyze and evaluate nonfiction (such as biographies, newspapers, technical manuals) from a variety of cultures and times**

Text Features - analyze text features to clarify meaning, emphasizing consumer texts

Literary Techniques - identify and explain literary techniques and figurative language in nonfiction text, emphasizing hyperbole, imagery, and propaganda

## Text Structures in reading

1. summarize author's ideas
2. make predictions
3. make inferences
4. evaluate the accuracy of the information
5. use two or more nonfiction texts to:

- \* sequence events
- \* compare and contrast
- \* identify and explain cause and effect
- \* identify problem solving processes and explain the effectiveness of solutions

Understanding Directions - read and follow multi-step directions to complete a complex task

## **Communication Arts - Writing Curriculum Overview**

### **Apply a writing process in composing text**

Writing Concepts - follow a writing process to

1. use appropriate pre-writing strategies
2. generate a draft
3. reread, revise for audience and purpose, ideas and content, organization and sentence structure, and word choice work
4. edit for conventions
5. publish writing

### **Compose well-developed text**

Audience & Purpose - compose text

1. showing awareness of audience
2. choosing a form appropriate to topic and specific audience

Ideas & Contents - compose text with

1. a clear controlling idea
2. relevant details /examples

Organization & Sentence Structure - compose text with

1. an effective beginning, middle, and end
2. a logical order
3. appropriate paragraphing

4. a variety of sentence structures, including complex sentences
5. cohesive devices, especially transitions

Word Choice - compose text using

1. precise and vivid language
2. writing techniques, such as figurative language, sensory detail, and purposeful dialogue

Conventions in written text

1. capitalize within dialogue
2. use commas correctly quotation marks in dialogue, and semi-colon in compound sentences
3. use correct agreement of pronoun and antecedent, and consistent verb tense
4. use standard spelling, classroom resources and dictionary to edit for correct spelling

### **Write effectively in various forms and types of writing**

Forms/Types/Modes of Writing - compose a variety of texts

1. using narrative, descriptive, expository, and/or persuasive features
2. including a summary
3. responding to literature

## **SCIENCE CURRICULUM OVERVIEW**

### **Standard 1: Properties and Principles of Matter and Energy**

The student will be able to:

1. Define and explain the basic vocabulary associated with electricity.
2. Identify and predict specific conditions that will cause static electricity.
3. Classify material as conductor or insulators of electricity when placed within a circuit (wood, plastic, salt water, tap water...).
4. Diagram and distinguish between complete series and parallel circuits.
5. Compare the advantages/disadvantages of series and parallel circuits.
6. Describe the relationship between temperature and the movement of atmospheric gases (warm air rises due to expansion of the volume of gas, cool air sinks due to contraction of the volume of gas).
7. Explain that the amount of matter remains constant while being recycled through the water cycle.
8. Recognize that thermal energy is transferred as heat from warmer objects to cooler objects until both reach the same temperature.
9. Recognize the type of materials that transfer energy by conduction, convection and radiation.
10. Describe how heat is transferred by conduction, convection and radiation and classify examples of each.

11. Predict the difference in temperature over time on different colored (black and white) objects absorb and emit radiant energy.
12. Measure the amount of space a solid/liquid takes up (volume) using appropriate tools (graduated cylinder).
13. Compare the masses of matter to the nearest gram using a balance.
14. Observe, collect, and record qualitative and quantitative information about physical and chemical changes.

## **Standard 2: Properties and Principles of Force and Motion**

The student will be able to:

1. Define force as a push or pull, and identify examples of forces.
2. Define kinetic energy as the energy of motion and give examples.
3. Define potential energy as the energy of position or condition and give examples.
4. Analyze the changes of kinetic and potential energy in common activities (roller coaster...).
5. Calculate the speed of an object in motion.
6. Represent graphically an object's motion in terms of distance vs. time (speed).
7. Compare the forces acting on an object using a spring scale to measure them to the nearest Newton.
8. Solve problems on the amount of work done when an object is moved or a task is performed (force applied to an object over a distance).
9. Explain how the change of speed is affected by the amount of force and the mass of an object.
10. Recognize that the amount of work input equals the amount of work output with or without the use of a simple machine.
11. Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why.

## **Standard 5: Processes and Interactions of the Earth's systems.**

The student will be able to:

1. Describe the components of soil and other factors that influence soil texture, fertility, and resistance to erosion (plant roots, debris, bacteria, fungi, worms, and rodents).
2. Recognize the properties of water that make it an essential component of the Earth's system.
3. Describe the properties of the Earth's layers (mantle, crust, inner core, and outer core).
4. Use fossil evidence to make inference about changes on Earth and its environment:
  - superposition of rock layers
  - similarities between fossils in different geographical locations
  - fossils of extinct organisms.
5. Use explanations of the fossil-forming processes to describe how fossils are used as evidence for Earth's geologic history.
6. Gather evidences of changes to the Earth's surface caused by destructive and constructive forces and explain the processes involved.
7. Identify and classify samples of the Earth's material into minerals or rocks.

8. Conduct simple field tests to determine physical properties of a mineral and use the results of tests to identify the mineral (texture, smell, luster, hardness, crystal shape, streak, and reaction to magnets).
9. Conduct laboratory investigations to determine properties of a variety of rocks (sedimentary, metamorphic and igneous) and use the results of the investigations to infer process that led to the formation of these samples.
10. Explain the process involved in the heating and convection of molten materials with the mantle.

**Standard 6: Composition and Structure of the Universe and the Motion of the Objects within It.**

The student will be able to:

1. Classify celestial bodies in the solar system into categories: sun, moon, planets and other small bodies.
2. Compare and contrast the size, composition, atmosphere and surface of the planets (inner vs. outer planets) in our solar system and Earth's moon.
3. Illustrate and explain the daily rotation of the Earth and the conditions that create sunrise, sunset, solar noon, and mid-night.
4. Chart the changes in the shape of the lit portion of the Moon that can be seen from Earth on a day-to-day cycle.
5. Name and order the phases of the moon.
6. Demonstrate how the Earth revolve around the Sun.
7. Observe that the position of the Sun at solar noon is higher in the warm months and lower in the colder months (shadow).
8. Compare the size and position of the Sun to the rest of the objects in the solar system.
9. Compare and contrast the size, composition and surface of the nine planets in our solar system.
10. Explain the characteristics of Earth that support life (distance from the sun, temperature, atmosphere).
11. Compare the distance light travels from the sun to Earth to the distance light travels from other stars to Earth using light years.

**Standard 7: The student will demonstrate a basic understanding of the process of scientific inquiry.**

The student will:

1. Formulate orally and in writing testable questions and hypotheses with an 85% accuracy.
2. Design and conduct a valid experiment including manipulation of only one variable and multiple trials.
3. Evaluate the design of an experiment and make suggestions for reasonable improvements of an experiment.
4. Determine the appropriate tools and techniques to collect, analyze, and interpret data.
5. Use a variety of tools and equipment to gather data (microscope , computers, scales graduated cylinders...)
6. Measure length, mass, volume temperature force...
7. Find the mean, median and mode for sets of data.
8. Judge whether measurements and computation of quantities are reasonable.

9. Use quantitative and qualitative data as support for reasonable explanations.
10. Analyze whether evidence supports proposed explanations (hypotheses, theories, laws..).
11. Recognize that explanations have changed over time as a result of new evidence.
12. Recognize the possible effects of errors in observations, measurements and calculations.
13. Interpret data in order to make and support conclusions.
14. Communicate the procedures and results of investigations and explanations through oral presentations, drawings and charts, data, tables and graphs.

**Standard 8: Impact of Science, Technology and Human Activity.**

The student will be able to:

1. Identify the link between improvement in tools and discoveries in science.
2. Describe how technological solutions to problems can have both benefits and drawbacks.
3. Investigate the contributions of scientists and inventors.
4. Identify and evaluate the physical, social, economic and/or environmental problems that may be overcome using science and technology.
5. Explain how technological improvements such as those developed for use in space exploration or by the military have led to the invention of new products that may improve our lives on Earth.