

SIXTH GRADE
Grade Level Expectations

Mathematics Curriculum Overview

Number and Operations

Students will be able to understand numbers, ways of representing numbers, relationships among numbers and 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

Student will be able to understand meanings of operations and how they relate to one another

1. Describe effects of operations

Student will be able to compute fluently and make reasonable estimates

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

Algebraic Relationships

Student will be able to demonstrate understanding patterns, relations and functions

1. Create and analyze patterns
2. sort objects by size
3. Identify and compare functions

Student will be able to represent and analyze mathematical situations and structures using algebraic symbols

1. represent mathematical situations
2. describe and use mathematical manipulations

Student will be able to use mathematical models to represent and understand quantitative relationships

Student will be able to represent and analyze change in various contexts

Geometric and Spatial Relationships

Student will be able to analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about geometric relationships

1. Describe and use geometric relationships
2. Apply geometric relationships

Student will be able to specify locations and describe spatial relationships using coordinate geometry and other representational systems

1. Use coordinate systems

Student will be able to apply transformations and use symmetry to analyze mathematical situations

1. Use transformations on objects
2. Use symmetry

Student will be able to use visualization, spatial reasoning and geometric modeling to solve problems

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

Measurement

Student will be able to understand measurable attributes of objects and the units, systems and processes of measurement

1. Determine unit of measurement
2. Tell and use units of time

Student will be able to apply appropriate techniques, tools and formulas to determine measurements.

1. Use standard of non-standard measurement
2. Use angle measurement
3. Apply geometric measurements
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

Understand and 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 resolution (problem/conflict and climax)
2. analyze the influence of setting on characters and plot
3. explain cause and effect
4. identify point of view
5. identify the problem- solving processes of characters and evaluate the effectiveness 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

1. Identify and explain text features in biography and autobiography

2. Analyze text features to clarify meaning, emphasizing newspapers and magazines

Literary Techniques - identify and explain literary techniques and figurative language in nonfiction text, emphasizing simile and metaphor

Text Structures in reading

1. paraphrase author's stated ideas
2. make predictions
3. make inferences
4. evaluate the accuracy of the information
5. use two or more nonfiction texts to:
6. sequence events
7. compare and contrast
8. identify and explain cause and effect
9. identify problem solving processes and explain the effectiveness of solutions

Understanding Directions

1. 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 a prewriting strategy
2. generate a draft
3. reread, revise for audience and purpose, ideas and content, organization and sentence structure, and word choice work (W2A, W2B, W2C, W2D)
4. edit for conventions (W2E)
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 and Sentence Structure - compose text with

1. a clear, beginning, middle, and end
2. a logical sequence of events
3. paragraphing
4. a variety of sentence structures, including simple and compound

Word Choice - compose text using

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

Conventions in written text

1. capitalize proper adjectives, and appropriate words in dialogue, with assistance
2. use comma in compound sentences, apostrophe in irregular and plural possessives, quotation marks in dialogue, with assistance
3. punctuate prepositional phrases and appositives correctly
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, using narrative, descriptive, expository, and/or persuasive features including a summary (narrative or informational)

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 of matter (mass, volume, weight, density...).
2. Measure the amount of space a solid/liquid takes up (volume) using appropriate tools (graduated cylinder).
3. Compare the masses of matter to the nearest gram using a balance.
4. Differentiate between physical and chemical properties of matter.
5. Observe, collect, and record qualitative and quantitative information about physical and chemical changes.
6. Demonstrate how the addition or removal of heat, light or air affects physical or chemical changes in the state of matter.
7. Identify and label the parts of an atom.
8. Describe ways to separate mixture (sorting, evaporation, filtration, magnets, screening, and chromatography)
9. Use appropriate tools to describe a pure substance according to its properties (magnetic, conductivity, melting and boiling point, solubility...).

10. Compare the properties of a pure substance to a mixture.
11. Identify the components and properties of different solutions (salt water, oil and vinegar, pond water, kool-aid...).
12. Conduct investigations to determine the capacity of a substance to dissolve in water.
13. Describe a solution as a solute dissolved in a solvent.
14. Know that solution properties depend upon concentration, properties, and interactions of the solutes and solvents.
15. Identify acids, bases, and Ph scales.
16. Explain and predict the product formed by an acid/base reaction.
17. Determine the Ph of household chemicals
18. Conduct investigations to determine and compare characteristics of acidic and basic solutions.
19. Identify producers of light.
20. Use appropriate tools to show that light travels in a straight line.
21. Compare the reflection of light from various surfaces.
22. Conduct investigations and compare the refraction of light passing through different material (prisms, water, lenses...).
23. Using a prism, illustrate and explain that white light is a mixture of many different colors of light that is visible to the human eye.

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 3: Characteristics and interactions of living organisms.

The student will be able to:

1. Classify common organisms into appropriate kingdom, phylum, and class.
2. Utilize a taxonomic/dichotomous key to identify organisms.
3. Compare and contrast unicellular/multicellular organisms as producers, consumers, decomposers by the role they serve within an ecosystem.

4. Compare and contrast plant and animal cells using a microscope.
5. Identify major characteristics of plants.
6. Explain how plants are classified: nonvascular/vascular; vascular subdivided into seedless or seed; seed plants subdivided into angiosperm/gymnosperm
7. Identify/compare and contrast characteristics of vascular and non vascular plants, seed and seedless plants, and angiosperm/gymnosperm.
8. Describe the structure and function of roots, stem, and leaves.
9. Identify parts of a flower and their functions,
10. Describe fertilization and pollination in flowering plants.
11. Explain how fruits and seeds are formed from flowers
12. List and describe examples of asexual reproduction in plants,
13. Illustrate / explain the process of photosynthesis

Standard 4: Changes in Ecosystems and Interactions of Organisms with their Environments.

The student will be able to:

1. Define and explain the basic vocabulary of an ecosystem (ecosystem, population, species, niche, biomes, habitat, food chain, and food web).
2. Classify consumer, producers, and decomposers and compare their relationships.
3. Identify the biotic and abiotic factors that would affect the population within an ecosystem (quantity of light and water, temperature and temperature range, soil composition, disease, predation, and competition from other organisms).
4. Predict how abiotic and biotic factors determine the populations within an ecosystem.
5. Illustrate and describe the flow of energy in an aquatic and land food web.
6. Describe beneficial and harmful activities of organisms, including humans, and explain how these activities affect organisms within an ecosystem (water and air pollution, global warming, depletion of resources, channelization, reintroduction of species...).
7. Describe beneficial changes that might occur in an ecosystem and specify how organisms adapt.
8. Illustrate the recycling of matter in the water and carbon cycle.
9. Identify and describe the different biomes of the world.

Standard 7: Scientific Inquiry.

The student will be able to:

1. Formulate testable questions and hypotheses.
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, and graduated cylinders...).
6. Measure length, mass, volume temperature force...
7. Find the mean, median and modes of 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.