COMMON CORE STATE STANDARDS FOR MATHEMATICS CONTENT ALIGNED TO INVENTION PROJECT II(TM) / 6-8

RATIOS AND PROPORTIONAL RELATIONSHIPS

- Understand ratio concepts and use ratio reasoning to solve problems.

  6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems.

  b. Solve unit rate problems including those involving unit pricing and constant speed.

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

  7.RP.2 Recognize and represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn

THE NUMBER SYSTEM

- Compute fluently with multi-digit numbers and find common factors and multiples.

  6.NS.2 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

- Apply and extend previous understanding of numbers to the system of rational numbers.

6.NS.7 Understand ordering and absolute value of rational numbers.

b. Write, interpret, and explain statements of order for rational numbers in real-world contexts.

c. Understand the absolute value of a rational number as its distance form 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

- Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers.

7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

d. apply properties of operations as strategies to add and subtract rational numbers.

7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

c. Apply properties of operations as strategies to multiply and divide rational numbers.

d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0's or eventually repeats.

- Know that there are numbers that are not rational, and approximate them by rational numbers.

8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion, which repeats eventually into a rational number.

GEOMETRY

- Solve real-world and mathematical problems involving area, surface area, and volume.

6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in context of solving real-world and mathematical problems.

- Draw, construct, and describe geometrical figures and describe the relationships between them.

7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

STATISTICS AND PROBABILITY

- Summarize and describe distributions.

6.SP.5 Summarize numerical data sets in relation to their context, such as by:

a. Reporting the number of observations.

b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

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COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS CONTENT ALIGNED TO INVENTION PROJECT II(TM) / 6-8

SPEAKING AND LISTENING

- Comprehension and Collaboration

6.SL.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 6 topics, texts, and issues, building on other's ideas and expressing their own clearly.

a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

b. Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

c. Pose and respond to specific questions with elaborations and detail by making comments that contribute to the topic, text, or issue under discussion.

7.SL.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

a. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

b. Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

c. Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussions back on topic as needed.

d. Acknowledge new information expressed by others and, when warranted, modify their own views.

8.SL1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacherled)d with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

a. Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

b. Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

c. Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

d. Acknowledge new information expressed by others, and when warranted, qualify or justify their own views in light of the evidence presented.

- Presentation of Knowledge and Ideas

6.SL.2 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

6.SL.3 Include multimedia components (e.g., graphics images, music, sound) and visual displays in presentations to clarify information.

7.SL.2 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

7.SL.3 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

8.SL.2 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

8.SL.3 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

STANDARDS FOR LITERACY IN SCIENCE AND TECHNICAL SUBJECTS

- Key ideas and Details

  6-8.RST.3 Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.

NEXT GENERATION SCIENCE STANDARDS ALIGNED TO INVENTION PROJECT II(TM) 6-8

MIDDLE SCHOOL PHYSICAL SCIENCES STORYLINE

- MS-PS1 Matter and Its Interactions

  Grade 2 - Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

  Grade 3 - Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

  Grade 4 - Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

  Grade 5 - Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

  Grade 6 - Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by a chemical process.

- MS.PS2 Motion and Stability: Forces and Interactions

  Grade 1 - Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

  Grade 2 - Plan an investigation to provide evidence that the change in an objects motion depends on the sum of the forces on the object and the mass of the object.

  Grade 3 - Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.

- MS.PS3 Energy

Grade 3 - Apply scientific principles to design, construct, and device that either minimizes or maximizes thermal energy transfer.

Grade 4 - Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.

Grade 5 - Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

- MS.PS4 Waves and their Applications in Technologies for Information Transfer

Grade 2 - Develop and use a model to describe that waves are reflected, absorbed, ore transmitted through various materials.

MIDDLE SCHOOL LIFE SCIENCE STORYLINE

- MS.LS1 From Molecules to Organisms: Structures and Processes

Grade 6 - Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

- MS.LS2.2 Ecosystems: Interactions, Energy, and Dynamics

Grade 2 - Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.

Grade 3 - Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.

Grade 5 - Evaluate competing design solutions for maintaining biodiversity and ecosystem system services.

- MS.LS4 Biological Evolution: Unity and Diversity

Grade 4 - Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.

Grade 5 - Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

MIDDLE SCHOOL EARTH AND SPACE SCIENCES STORYLINE

- MS.ESS2 Earth's Systems

Grade 1 - Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Grade 4 - Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.

MIDDLE SCHOOL ENGINEERING DESIGN STORYLINE

- MS.ETS1 Engineering Design Storyline

Grade 1 - Define the criteria and constraints of design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Grade 2 - Evaluate competing design solutions using a systematic process to determine how well they maeet the criteria and constraints of the problem.

Grade 3 - Analyze data from tests to determine similarities and differences among several design solutions to identify the

best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Grade 4 - Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.