

CAMP INVENTION® INNOVATION FORCE® ALIGNED TO COMMON CORE AND NEXT GENERATION SCIENCE STANDARDS

KEY CONCEPTS

- Technology is used in many different ways to enhance communication.
- Determine or clarify the meaning of unknown and multiple-meaning words and phrases used to create a new superhero name.
- Create a superhero disguise reflecting a specific superpower or day-job that includes specified criteria for success and constraints on materials, time, or cost.
- Nanocomposite technology helps to increase the strength and wear-resistance of dental filling materials.
- Thermocolor paint changes color due to exposure to heating or cooling and the effect can be reversed.
- Brainstorming ideas helps to generate more and better ideas than simply building without thought first.
- Prototyping is an essential part of ideation and inventing.
- Intellectual property is an idea, creation, or design that one can apply for a patent or trademark to protect.
- Writing clearly and concisely is essential to good communication when conveying ideas.
- Patent certificates are how ideas are registered as unique and original and protected from theft.
- Logos and Trademarks are present on many print and digital media and products.
- X-ray technology has been used to provide visual information and enhance human understanding of the Universe.
- Light-sensitive paper permanently changes color when exposed to ultraviolet light rays.
- Logo designs can include words or images, and can be used to represent people, places, or objects.
- When light refracts from objects and enters the eye it allows objects to be seen.
- Light can be used to project an image and will travel along a path.
- Explore the power of marketing.
- Marketing is the act of promoting or selling a product or service.
- An advertisement and a pitch are often used to market a product or service.
- Matching identical logos can be one step in understanding symbols and their meanings.
- Clearly define and describe a super hero gadget, including an illustration to show its utility.
- Creating a verbal explanation of an idea, including asking and answering questions, is essential to creating a marketing pitch.
- Brainstorming leads to open-ended idea generation and better problem solving.

OBJECTIVES

Children will:

- Hear how technology has changed communication in our world.
- Create an innovative superhero name that protects their identity.
- Discuss how innovative disguises are used everyday.
- Make disguises to protect their new identities.
- Hear how nanocomposites and nanocomposite science have been used in dental materials.
- Explore thermocolor paint.
- Brainstorm superhero gadgets that will retrieve ideas from the Plagiarizer's trap.
- Watch out for the Idea Crusher, villain and side-kick, that is "crushing" ideas.
- Build a prototype of their invention.
- Test their inventions, iterate, and make modifications and improvements to their invention.
- Learn about the importance of Intellectual Property.
- Fill out a Patent Application in their Inventors Log.
- Learn about and receive a Patent Certificate.
- Find trademark (™) and registered trademark (®) symbols in the room.
- Hear how x-rays have helped humans explore the universe.
- Explore and use light-sensitive "x-ray" paper.
- Design personalized logos for themselves as superheroes or for their inventions
- Learn about the idea of light projection.
- Build a light projection device that will project their unique superhero logos.
- Explore the power of marketing.
- Learn about the power of marketing.
- Create an advertisement and a pitch to market their gadget.
- Play the Logo Matching Game (Primary).
- Fill out a Super Gadget handout.
- Suit up in their superhero disguise and develop a marketing pitch for their gadget invention.
- Celebrate the successful pitch of their super inventive gadget.
- Brainstorm ideas for their next superhero gadget.

INNOVATION FORCE® ALIGNED TO NEXT GENERATION SCIENCE STANDARDS K-6

KINDERGARTEN - GRADE TWO

K-2-ETS1 ENGINEERING DESIGN

- K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

GRADE THREE - FIVE

3-5-ETS1 ENGINEERING DESIGN

- 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

GRADE SIX - EIGHT

MS-ETS1 ENGINEERING DESIGN

- MS-ETS1-1. Define the criteria and constraints of a 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.
- MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

KINDERGARTEN

K-PS2 MOTION AND STABILITY: FORCES AND INTERACTIONS

- K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

GRADE ONE

1-PS4 WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER

- 1-PS4-2. Make observations to construct an evidence-based account that objects can be seen only when illuminated.
- 1-PS4-3. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.
- 1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

GRADE TWO

2-PS1 MATTER AND ITS INTERACTIONS

- 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- 2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.

GRADE THREE

3-PS2 MOTION AND STABILITY: FORCES AND INTERACTIONS

- 3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- 3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- 3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

GRADE FOUR

4-PS4 WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER

- 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

4-PS3 ENERGY

- 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

GRADE FIVE

5-PS1 MATTER AND ITS INTERACTIONS

- 5-PS1-3. Make observations and measurements to identify materials based on their properties.
- 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

GRADE SIX

MS-PS1 MATTER AND ITS INTERACTIONS

- MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

MS-PS4 APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER

- MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

INNOVATION FORCE® ALIGNED TO COMMON CORE STATE STANDARDS FOR MATHEMATICS K-6

KINDERGARTEN

COUNTING AND CARDINALITY K.CC

- K.CC4. Understand the relationship between numbers and quantities; connect counting to cardinality.
 - a. When counting objects, say the number names in standard order, pairing each object with one and only one number name and each number name with one and only one object.
 - b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
 - c. Understand that each successive number name refers to a quantity that is one larger.

GEOMETRY K.G

- KG1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
- KG3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").
- KG4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
- K.G5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

GRADE ONE

GEOMETRY 1.G

- 1G1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
- 1.G3. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares Understand for these examples that decomposing into more equal shares creates smaller shares.

GRADE TWO

GEOMETRY 2.G

- 2.G3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

GRADE THREE

GEOMETRY 3.G

- 3.G2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $\frac{1}{4}$ of the area of the shape.

GRADE FOUR

GEOMETRY 4.G

- 4.G1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines.

INNOVATION FORCE® ALIGNED TO COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS K-6

LANGUAGE STANDARDS L

KINDERGARTEN

Conventions of Standard English

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
 - e. Use adjectives and adverbs, and choose between them depending on what is to be modified.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on kindergarten reading and content.

GRADE ONE

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
 - f. Use frequently occurring adjectives.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content, choosing flexibly from an array of strategies.

GRADE TWO

- L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
 - e. Use adjectives and adverbs, and choose between them depending on what is to be modified.
- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 2 reading and content, choosing flexibly from an array of strategies.

GRADE THREE

- L4. Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.
 - b. Identify real-life connections between words and their use (e.g., describe people who are friendly or helpful).

GRADE FOUR

- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

GRADE FIVE

- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.

GRADE SIX

- L4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.

READING STANDARDS FOR LITERATURE RL

KINDERGARTEN

- RL7. With prompting and support, describe the relationship between illustrations and the story in which they appear (e.g., what moment in a story an illustration depicts).

GRADE TWO

- RL7. Use information gained from the illustrations and words in a print or digital text to demonstrate understanding

of its characters, setting, or plot.

GRADE FOUR

- RL7. Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text.

READING STANDARDS FOR INFORMATIONAL RI

GRADE ONE

- RI5. Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
- RI6. Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.

GRADE TWO

- RI3. Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text.
- RI5. Know and use various text features (e.g., captions, bold print, subheadings, glossaries, indexes, electronic menus, icons) to locate key facts or information in a text efficiently.

GRADE THREE

- RI7. Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

GRADE FOUR

- RI7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

GRADE FIVE

- RI7. Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

GRADE SIX

- RI7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

WRITING STANDARDS W

KINDERGARTEN

- W8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

GRADE ONE

- W8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

GRADE TWO

- W8. Recall information from experiences or gather information from provided sources to answer a question.

SPEAKING AND LISTENING STANDARDS SL

KINDERGARTEN

- SL1. Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
 - a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).
 - b. Continue a conversation through multiple exchanges.
- SL2. Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.
- SL3. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
- SL4. Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
- SL5. Add drawings or other visual displays to descriptions as desired to provide additional detail.

GRADE ONE

- SL1. Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
 - a. Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
 - b. Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
 - c. Ask questions to clear up any confusion about the topics and texts under discussion.
- SL2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- SL3. Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
- SL5. Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

GRADE TWO

- SL1. Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
 - a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
 - b. Build on others' talk in conversations by linking their comments to the remarks of others.
 - c. Ask for clarification and further explanation as needed about the topics and texts under discussion.
- SL3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

GRADE THREE

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.
 - b. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).

c. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.

d. Explain their own ideas and understanding in light of the discussion.

- SL2. Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
- SL3. Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

GRADE FOUR

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
 - b. Follow agreed-upon rules for discussions and carry out assigned roles.
 - c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
 - d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

GRADE FIVE

- SL1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
 - b. Follow agreed-upon rules for discussions and carry out assigned roles.
 - c. Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
 - d. Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

GRADE SIX

- SL1. 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 others' ideas and expressing their own clearly.
 - c. Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
- SL2. Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

LITERACY IN SCIENCE AND TECHNICAL SUBJECTS RST

GRADE SIX

- RST3. Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.

READING IN SCIENCE AND TECHNICAL SUBJECTS (RST)

- 6-8.R.ST Cite specific textual evidence to support analysis of science and technical texts.
- 6-8.R.ST.3 Key Ideas and Details: Follow precisely a multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks.
- 6-8.R.ST.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.