KEY CONCEPTS (FLIGHT SIGHT)

- Early flight pioneers were inspired by birds.
- Topographic maps show elevation and the relative position of Earth's features.
- Flight allowed man to have a bird's eye view of the ground.
- Topographic maps show elevation and the relative position of Earth features.
- Experimenting with gliders enabled the Wright brothers to learn about flight.
- Design is paramount when constructing a glider.
- Flight allowed man to have a bird's eye view of Earth.
- Flight allowed people to view not only neighborhoods but also the whole Earth from a different perspective.
- The future holds many unknowns that must be considered for future flight.
- Jet pilots go through a great deal of training in order to fly their craft.
- Satellite imagery makes it possible to view the world at night by recording images that show where populations with electricity reside.
- Space suits are a necessity for travel outside of the space shuttle in order for astronauts to survive.

OBJECTIVES

- Create a device that may help them jump higher and stay airborne longer.
- Observe a demonstration about topographic maps and experience different aerial perspectives through simulation.
- Create topographic maps by starting with a glider's view of an area found on Earth.
- Create large paper gliders from tag board and then attempt to fly them.
- View a model village from different perspectives.
- Design and create three-dimensional maps.
- Design and create a flight craft of the future.
- Design and build a flight simulator for jet pilots.
- Create images of favorite geographic areas as if they were seeing them from a satellite-viewing platform in space.
- Discuss the possible environments that an astronaut would encounter in space, and design and create a space suit that would be best adapted to that environment.

COMMON CORE STATE STANDARDS FOR MATHEMATICS ALIGNED TO FLIGHT SIGHT (TM) K-5

COUNTING AND CARDINALITY

- K.CC1 Count to 100 by ones and by tens.
- K.CC2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
- K.CC6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

OPERATIONS AND ALGEBRAIC THINKING

- 1.OA1 Use addition and subtraction within 20 to solve word problems involving situation of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, eg., by using objects, drawings, and equations with symbol for the unknown number to represent the problem.
- 1.OA6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on: making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 + 14): decomposing a number leading to a ten (e.g., 13 - 4 = 13 - 3 - 1 = 10 - 1 = 9): using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 - 8 = 4): and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 13).

- 2.OA1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- 2.OA2 Fluently add and subtract within 20 using mental strategies.

NUMBER & OPERATIONS IN BASE TEN

- K.NBT1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by drawing or equation (e.g., 18 + 10 + 8): understand that these numbers are composed of ten ones and one two, three, four, five, six, seven, eight, ore nine ones.
- 1.NBT4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones: and sometimes it is necessary to compose a ten.
- 2.NBT5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

MEASUREMENT & DATA

- K.MD3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
- 1.MD4 Organize, represent, and interpret data with up to three categories: ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
- 2.MD9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
- 3.MD3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs.
- 4.MD4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
- 5.MD5 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots.

GEOMETRY

- K.G5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
- 1.G2 Compose two-dimensional shapes or three-dimensional shapes to create a composite shape, and compose new shapes from the composite shape.

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY IN HISTORY/SOCIAL STUDIES, SCIENCE, AND TECHNICAL SUBJECTS ALIGNED TO FLIGHT SIGHT (TM) K-5

WRITING STANDARDS

- Range of Writing

1. Write routinely over extended time frames (time for research, reflections, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

SPEAKING AND LISTENING

- Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

- Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

LANGUAGE

- Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

- Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

NEXT GENERATION SCIENCE STANDARDS ALIGNED TO FLIGHT SIGHT (TM)
K-5 PHYSICAL SCIENCE

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.
- K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

2-PS1 MATTER AND ITS INTERACTIONS

- 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- 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-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

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.

4-PS3 ENERGY

- 4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object.
- 4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.

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

- 4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
- 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.

5-PS1 MATTER AND ITS INTERACTIONS

- 5-PS1-3. Make observations and measurements to identify materials based on their properties.

5-PS2 MOTION AND STABILITY: FORCES AND INTERACTIONS

- 5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.

EARTH AND SPACE SCIENCES

2-ESS2 EARTH'S SYSTEMS

- 2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area.
- 2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.

4-ESS2 EARTH'S SYSTEMS

- 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

ENGINEERING DESIGN

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.
- K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

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.
- 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.