



**Zula Exploration Mission Modules  
Alignment with Content Standards for California Public Schools**

***Legend***

SM = Simple Machines Exploration Mission Module

MSCR = Mixtures, Solutions, and Chemical Reactions Exploration Mission Module

FR = Force Exploration Mission Module

HB = Habitats Exploration Mission Module

MA = Matter Exploration Mission Module

LT = Light Exploration Mission Module

H<sub>2</sub>O = Water Exploration Mission Module

PALC = Plants, Animals, and Life Cycles Mission Module

All = All current and future Zula activities and lesson plans

FK = Future Mission Exploration Modules

**Kindergarten**

**Language Arts**

***Reading***

**1.0 Word Analysis, Fluency, and Systematic Vocabulary Development**

***Concepts About Print***

- 1.2 Follow words from left to right and from top to bottom on the printed page. (All)
- 1.3 Understand that printed materials provide information. (All)

***Vocabulary and Concept Development***

- 1.18 Describe common objects and events in both general and specific language. (All)

## **2.0 Reading Comprehension**

### *Comprehension and Analysis of Grade-Level-Appropriate Text*

- 2.2 Use pictures and context to make predictions about story content. (All)
- 2.3 Connect to life experiences the information and events in texts. (All)
- 2.4 Retell familiar stories. (All)
- 2.5 Ask and answer questions about essential elements of a text. (All)

## **3.0 Literary Response and Analysis**

### *Narrative Analysis of Grade-Level-Appropriate Text*

- 3.3 Identify characters, settings, and important events. (All)

## **Writing**

### **1.0 Writing Strategies**

#### *Organization and Focus*

- 1.1 Use letters and phonetically spelled words to write about experiences, stories, people, objects, or events. (All)
- 1.3 Write by moving from left to right and from top to bottom. (All)

## **Listening and Speaking**

### **1.0 Listening and Speaking Strategies**

#### *Comprehension*

- 1.1 Understand and follow one- and two-step oral directions. (All)
- 1.2 Share information and ideas, speaking audibly in complete, coherent sentences. (All)

### **2.0 Speaking Applications**

#### *Genres and Their Characteristics*

- 2.1 Describe people, places, things, locations, and actions. (All)

## **Mathematics**

### *Number Sense*

#### **1.0 Students understand the relationship between numbers and quantities (i.e., that a set of objects has the same number of objects in different situations regardless of its position or arrangement):**

- 1.1 Compare two or more sets of objects (up to ten objects in each group) and identify which set is equal to, more than, or less than the other. (SM, MSCR, FK)

1.2 Count, recognize, represent, name, and order a number of objects (up to 30). (SM, MSCR, FK)

**3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places:**

3.1 Recognize when an estimate is reasonable. (SM, H2O, MSCR, FK)

*Algebra and Functions*

**1.0 Students sort and classify objects:**

1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red). (SM, MSCR, HB, H2O, FK)

*Measurement and Geometry*

**1.0 Students understand the concept of time and units to measure it; they understand that objects have properties, such as length, weight, and capacity, and that comparisons may be made by referring to those properties:**

1.1 Compare the length, weight, and capacity of objects by making direct comparisons with reference objects (e.g., note which object is shorter, longer, taller, lighter, heavier, or holds more). (SM, MSCR, H2O, FR, FK)

**2.0 Students identify common objects in their environment and describe the geometric features:**

2.1 Identify and describe common geometric objects (e.g., circle, triangle, square, rectangle, cube, sphere, cone). (SM, FK)

2.2 Compare familiar plane and solid objects by common attributes (e.g., position, shape, size, roundness, number of corners). (SM, FK)

*Statistics, Data Analysis, and Probability*

**1.0 Students collect information about objects and events in their environment:**

1.1 Pose information questions; collect data; and record the results using objects, pictures, and picture graphs. (All)

**Science**

*Physical Sciences*

1. Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:

- a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking). (SM, MSCR, H2O, FK)
- b. Students know water can be a liquid or a solid and can be made to change back and forth from one form to the other. (MA, H2O, FK)
- c. Students know water left in an open container evaporates (goes into the air) but water in a closed container does not. (MA, FK)

### ***Life Sciences***

2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:
  - a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects). (HB, PALC, FK)
  - b. Students know stories sometimes give plants and animals attributes they do not really have. (PALC)
  - c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs). (PALC, HB, FK)

### ***Earth Sciences***

3. Earth is composed of land, air, and water. As a basis for understanding this concept:
  - a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms. (HB, FK)
  - b. Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants. (HB, FK)
  - c. Students know how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved. (FK)

### ***Investigation and Experimentation***

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
  - a. Observe common objects by using the five senses. (All)
  - b. Describe the properties of common objects. (All)
  - c. Describe the relative position of objects by using one reference (e.g., above or below). (SM, H2O, FK)
  - d. Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight). (SM, MSCR, H2O, FK)
  - e. Communicate observations orally and through drawings. (All)

# **First Grade**

## **Language Arts**

### **2.0 Reading Comprehension**

#### ***Comprehension and Analysis of Grade-Level-Appropriate Text***

- 2.2 Respond to *who*, *what*, *when*, *where*, and *how* questions. (All)
- 2.3 Follow one-step written instructions. (All)
- 2.6 Relate prior knowledge to textual information. (All)
- 2.7 Retell the central ideas of simple expository or narrative passages. (All)

### **3.0 Literary Response and Analysis**

#### ***Narrative Analysis of Grade-Level-Appropriate Text***

- 3.1 Identify and describe the elements of plot, setting, and character(s) in a story, as well as the story's beginning, middle, and ending. (All)

## ***Writing***

### **1.0 Writing Strategies**

#### ***Organization and Focus***

- 1.1 Select a focus when writing. (All)
- 1.2 Use descriptive words when writing. (All)

### **2.0 Writing Applications**

#### ***Genres and Their Characteristics***

- 2.1 Write brief narratives (e.g., fictional, autobiographical) describing an experience. (All)
- 2.2 Write brief expository descriptions of a real object, person, place, or event, using sensory details. (All)

## ***Listening and Speaking***

### **1.0 Listening and Speaking Strategies**

#### ***Comprehension***

- 1.1 Listen attentively. (All)
- 1.2 Ask questions for clarification and understanding. (All)
- 1.3 Give, restate, and follow simple two-step directions. (All)

### **2.0 Speaking Applications**

#### ***Genres and Their Characteristics***

- 2.2 Retell stories using basic story grammar and relating the sequence of story events by answering *who*, *what*, *when*, *where*, *why*, and *how* questions. (All)
- 2.3 Relate an important life event or personal experience in a simple sequence. (All)
- 2.4 Provide descriptions with careful attention to sensory detail. (All)

# Mathematics

## *Number Sense*

### **3.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, and hundreds places:**

3.1 Make reasonable estimates when comparing larger or smaller numbers. (SM, MSCR, H2O, FK)

## *Measurement and Geometry*

### **1.0 Students use direct comparison and nonstandard units to describe the measurements of objects:**

1.1 Compare the length, weight, and volume of two or more objects by using direct comparison or a nonstandard unit. (SM, MSCR, H2O, FR, FK)

### **2.0 Students identify common geometric figures, classify them by common attributes, and describe their relative position or their location in space:**

2.1 Identify, describe, and compare triangles, rectangles, squares, and circles, including the faces of three-dimensional objects. (SM, FK)

2.2 Classify familiar plane and solid objects by common attributes, such as color, position, shape, size, roundness, or number of corners, and explain which attributes are being used for classification. (SM, FK)

2.3 Give and follow directions about location. (SM, FR, FK)

2.4 Arrange and describe objects in space by proximity, position, and direction (e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of). (SM, FK)

## *Statistics, Data Analysis, and Probability*

### **1.0 Students organize, represent, and compare data by category on simple graphs and charts:**

1.1 Sort objects and data by common attributes and describe the categories. (SM, MSCR, H2O, FK)

1.2 Represent and compare data (e.g., largest, smallest, most often, least often) by using pictures, bar graphs, tally charts, and picture graphs. (All)

## Science

### *Physical Sciences*

1. Materials come in different forms (states), including solids, liquids, and gases. As a basis for understanding this concept:
  - a. Students know solids, liquids, and gases have different properties. (MA, FK)
  - b. Students know the properties of substances can change when the substances are mixed, cooled, or heated. (MA, FK)

### *Life Sciences*

2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:
  - a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places. (HB, PALC, FK)
  - b. Students know both plants and animals need water, animals need food, and plants need light. (HB, PALC, FK)
  - c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting. (HB, PALC, FK)
  - d. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight. (PALC, FK)

### *Earth Sciences*

3. Weather can be observed, measured, and described. As a basis for understanding this concept:
  - a. Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons. (FK)
  - b. Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season. (FK)
  - c. Students know the sun warms the land, air, and water. (FK)

### *Investigation and Experimentation*

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
  - a. Draw pictures that portray some features of the thing being described. (All)
  - b. Record observations and data with pictures, numbers, or written statements. (All)
  - c. Record observations on a bar graph. (FK)
  - d. Describe the relative position of objects by using two references (e.g., above and next to, below and left of). (SM, FR, FK)

- e. Make new observations when discrepancies exist between two descriptions of the same object or phenomenon. (All)

## **Second Grade**

### **Language Arts**

#### **Reading**

##### **2.0 Reading Comprehension**

###### *Comprehension and Analysis of Grade-Level-Appropriate Text*

- 2.2 State the purpose in reading (i. e., tell what information is sought). (All)
- 2.4 Ask clarifying questions about essential textual elements of exposition [e.g., *why*, *what if*, *how*]. (All)
- 2.5 Restate facts and details in the text to clarify and organize ideas. (All)
- 2.6 Recognize cause-and-effect relationships in a text. (All)
- 2.7 Interpret information from diagrams, charts, and graphs. (All)
- 2.8 Follow two-step written instructions. (All)

#### **Writing**

##### **1.0 Writing Strategies**

###### *Organization and Focus*

- 1.1 Group related ideas and maintain a consistent focus. (All)

###### *Research*

- 1.3 Understand the purposes of various reference materials (e.g., dictionary, thesaurus, atlas). (All)

##### **2.0 Writing Applications (Genres and Their Characteristics)**

###### *Genres and Their Characteristics*

- 2.1 Write brief narratives based on their experiences:
  - a. Move through a logical sequence of events. (All)
  - b. Describe the setting, characters, objects, and events in detail. (All)

#### **Listening and Speaking**

##### **1.0 Listening and Speaking Strategies**

###### *Comprehension*

- 1.1 Determine the purpose or purposes of listening (e.g., to obtain information, to solve problems, for enjoyment). (All)

- 1.2 Ask for clarification and explanation of stories and ideas. (All)
- 1.3 Paraphrase information that has been shared orally by others. (All)
- 1.4 Give and follow three-and four-step oral directions. (All)

***Organization and Delivery of Oral Communication***

- 1.8 Retell stories, including characters, setting, and plot. (All)
- 1.9 Report on a topic with supportive facts and details. (All)

**2.0 Speaking Applications**

***Genres and Their Characteristics***

- 2.1 Recount experiences or present stories:
  - a. Move through a logical sequence of events. (All)
  - b. Describe story elements (e.g., characters, plot, setting). (All)
- 2.2 Report on a topic with facts and details, drawing from several sources of information. (All)

**Mathematics**

***Number Sense***

**6.0 Students use estimation strategies in computation and problem solving that involve numbers that use the ones, tens, hundreds, and thousands places:**

- 6.1 Recognize when an estimate is reasonable in measurements (e.g., closest inch). (SM, MSCR, H2O, FK)

***Measurement and Geometry***

**1.0 Students understand that measurement is accomplished by identifying a unit of measure, iterating (repeating) that unit, and comparing it to the item to be measured:**

- 1.1 Measure the length of objects by iterating (repeating) a nonstandard or standard unit. (SM, FR, FK)
- 1.3 Measure the length of an object to the nearest inch and/or centimeter. (SM, FK)

**2.0 Students identify and describe the attributes of common figures in the plane and of common objects in space:**

- 2.1 Describe and classify plane and solid geometric shapes (e.g., circle, triangle, square, rectangle, sphere, pyramid, cube, rectangular prism) according to the number and shape of faces, edges, and vertices. (SM, FK)
- 2.2 Put shapes together and take them apart to form other shapes (e.g., two congruent right triangles can be arranged to form a rectangle). (SM, FK)

## *Statistics, Data Analysis, and Probability*

### **1.0 Students collect numerical data and record, organize, display, and interpret the data on bar graphs and other representations:**

- 1.1 Record numerical data in systematic ways, keeping track of what has been counted. (All)
- 1.2 Represent the same data set in more than one way (e.g., bar graphs and charts with tallies). (All)
- 1.4 Ask and answer simple questions related to data representations. (All)

## **Science**

### *Physical Sciences*

1. The motion of objects can be observed and measured. As a basis for understanding this concept:
  - a. Students know the position of an object can be described by locating it in relation to another object or to the background. (SM, FR, FK)
  - b. Students know an object's motion can be described by recording the change in position of the object over time. (FR, FK)
  - c. Students know the way to change how something is moving is by giving it a push or a pull. The size of the change is related to the strength, or the amount of force, of the push or pull. (FR, FK)
  - d. Students know tools and machines are used to apply pushes and pulls (forces) to make things move. (FR, SM, FK)
  - e. Students know objects fall to the ground unless something holds them up. (FR, FK)
  - f. Students know sound is made by vibrating objects and can be described by its pitch and volume. (FK)

### *Life Sciences*

2. Plants and animals have predictable life cycles. As a basis for understanding this concept:
  - a. Students know that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another. (PALC, HB, FK)
  - b. Students know the sequential stages of life cycles are different for different animals, such as butterflies, frogs, and mice. (PALC, FK)
  - c. Students know many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment. (PALC, HB, FK)
  - d. Students know there is variation among individuals of one kind within a population. (FK)
  - e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants. (PALC, FK)
  - f. Students know flowers and fruits are associated with reproduction in plants. (FK)

### ***Earth Sciences***

3. Earth is made of materials that have distinct properties and provide resources for human activities. As a basis for understanding this concept:
  - a. Students know how to compare the physical properties of different kinds of rocks and know that rock is composed of different combinations of minerals. (FK)
  - b. Students know smaller rocks come from the breakage and weathering of larger rocks. (FK)
  - c. Students know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants. (FK)
  - d. Students know that fossils provide evidence about the plants and animals that lived long ago and that scientists learn about the past history of Earth by studying fossils. (FK)
  - e. Students know rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use. (FK)

### ***Investigation and Experimentation***

4. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
  - a. Make predictions based on observed patterns and not random guessing. (All)
  - b. Measure length, weight, temperature, and liquid volume with appropriate tools and express those measurements in standard metric system units. (SM, MSCR, H2O, FK)
  - c. Compare and sort common objects according to two or more physical attributes (e. g., color, shape, texture, size, weight). (SM, MSCR, FK)
  - d. Write or draw descriptions of a sequence of steps, events, and observations. (All)
  - e. Construct bar graphs to record data. (FK)
  - f. Use magnifiers or microscopes to observe and draw descriptions of small objects or small features of objects. (FK)
  - g. Follow oral instructions for a scientific investigation. (All)