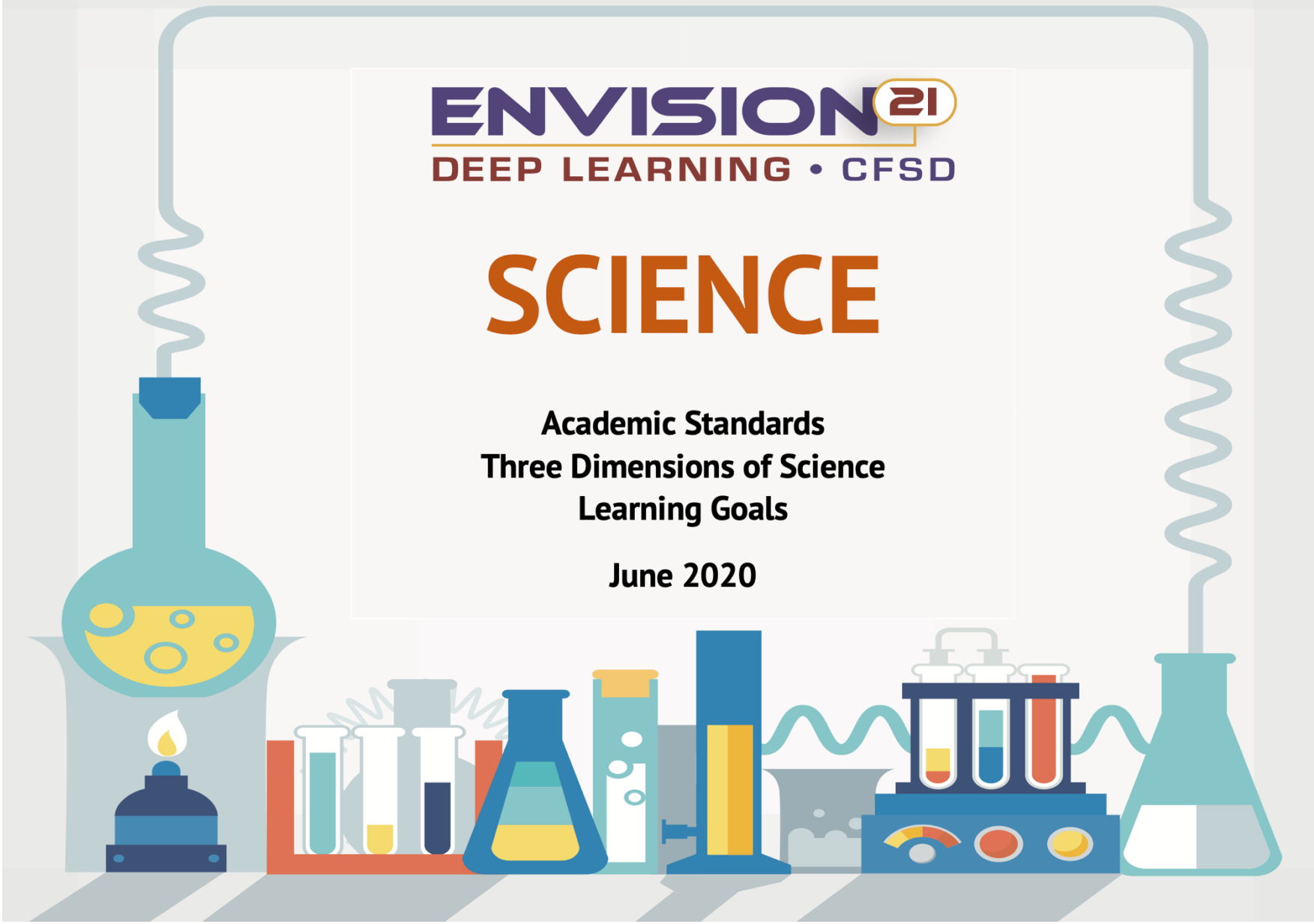
ENVISION 21

DEEP LEARNING • CFSD

SCIENCE

Academic Standards
Three Dimensions of Science
Learning Goals

June 2020



CATALINA FOOTHILLS SCHOOL DISTRICT
KINDERGARTEN SCIENCE STANDARDS

OVERVIEW

By the end of Kindergarten, students will investigate weather patterns and their influences on plants and animals; differentiate between living and non-living things; analyze the survival needs of plants and animals; and investigate the effects of equal and unequal forces. Student investigations focus on collecting and making sense of observational data and simple measurements using the science and engineering practices: ask questions and define problems, develop and use models, plan and carry out investigations, analyze and interpret data, use mathematics and computational thinking, construct explanations and design solutions, use evidence, and obtain, evaluate, and communicate information. While individual lessons may include connections to any of the crosscutting concepts, the standards in Kindergarten focus on helping students understand phenomena through the crosscutting concepts of *patterns* and *cause and effect*.

PHYSICAL SCIENCE

K.P3U1.1 Plan and carry out investigations which demonstrate how equal forces can balance objects and how unequal forces can push, pull, or twist objects, making them change their speed, direction, or shape.

- With guidance, design an investigation to test the effects of equal forces on objects (*i.e., balance*) and unequal forces on objects (*i.e., push, pull, or twist; making objects change speed, direction, or shape*):
    - Ask a testable question about the effects of forces on objects.
    - Based on prior knowledge, formulate a prediction about the effects of forces on objects.
    - In collaboration with peers, design a procedure that will produce data in response to the testable question.
    - In collaboration with peers, determine how observations and/or measurements will be made in order to answer the testable question.
- In collaboration with peers, conduct simple investigations to test the effects of equal forces on objects (*i.e. balance*) and unequal forces on objects (*i.e., push, pull, or twist; making objects change speed, direction, or shape*):
    - Follow a procedure with precision.
    - Make observations about the objects' motion.
    - Collect data about the effects of forces on objects.
    - Make inferences about how and why different forces affect objects.

EARTH AND SPACE SCIENCES

K.E1U1.2 Observe, record, and ask questions about temperature, precipitation, and other weather data to identify patterns or changes in local weather.

- Ask questions about local weather based on prior experiences.
- Make observations about the weather (i.e., temperature, precipitation, air pressure, wind direction, wind speed, water vapor):

    - Use senses to identify features or details of weather phenomena.
    - Take measurements of weather phenomena (e.g., using a barometer, thermometer, rain gauge, wind vane, etc.).
    - Record data about the weather (e.g., through pictures and/or words).
    - Make inferences about weather patterns based on observations.
- Use data collected over time to identify patterns or changes in local weather.

K.E1U1.3 Observe, describe, ask questions, and predict seasonal weather patterns; and how those patterns impact plants and animals (including humans).

- Make observations about seasonal weather patterns and their impact on plants and animals (including humans):
    - Take measurements of seasonal weather phenomena.
    - Record observations (e.g., through pictures and/or words).
    - Make inferences about seasonal weather patterns based on observations.
    - Make inferences about the impact of seasonal weather patterns based on observations.
- Ask questions:
    - Ask questions based on prior experiences with seasonal weather patterns.
    - Ask questions about the impact of seasonal weather patterns on plants and animals (including humans), based on prior experiences.
- Describe and predict seasonal weather patterns and their impact on plants and animals (including humans):
    - Describe seasonal weather patterns, using details from observations.
    - Describe how seasonal weather patterns affect plants and animals (including humans).
    - Predict future weather based on patterns of seasonal changes (e.g., “The past two summers were really hot, so this summer will be, too.”).
    - Predict seasonal weather patterns based on conditions and movement of the air (i.e., temperature, pressure, direction, and speed of movement; amount of water vapor in the air).
    - Use prior experiences to predict how seasonal weather patterns will affect plants and animals (including humans).

LIFE SCIENCE

K.L2U1.4: Obtain, analyze, and communicate evidence that organisms need a source of energy, air, water, and certain temperature conditions to survive.

- Obtain information about the survival needs of organisms (i.e., a source of energy, air, water, and temperature conditions):
    - Ask questions about the survival needs of organisms to frame the collection and analysis of evidence.
    - Use text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate relevant information.
    - Record information (e.g., through pictures and/or words) from texts and/or media about the survival needs of organisms.
    - Explain how visual images (e.g., diagrams) help clarify ideas in the text.

- Analyze information about the survival needs of organisms (i.e., a source of energy, air, water, and temperature conditions):
    - Use observations and evidence to describe what organisms need to survive.
    - Identify and explain patterns in the survival needs of organisms.
- Communicate (e.g., through discussion, writing, and/or drawing) about the survival needs of organisms (i.e., a source of energy, air, water, and temperature conditions):
    - Use evidence to explain the survival needs of organisms.

K.L2U1.5 Observe, ask questions, and explain the differences between the characteristics of living and non-living things.

- Based on prior experiences, ask questions about living and non-living things.
- Make direct or indirect observations about living and non-living things:
    - Identify traits of living and non-living things.
    - Record observations (e.g., through pictures and/or words).
    - Make inferences about the characteristics of living and non-living things.
- List the characteristics of living things (i.e., move, reproduce, react to stimuli).
- Use evidence to explain how the characteristics of living things differ from the characteristics of non-living things.
- Classify things as living or non-living.

COMPUTER SCIENCE: COMPUTATIONAL THINKING

K-2.AP.A.1 Model daily processes by following algorithms (sets of step-by-step instructions) to complete tasks.

- Follow a set of step-by-step instructions written in pseudo code.
- Use a map to model a program's step by step instructions.

K-2.AP.V.1 Model the way computer programs use symbols (e.g. numbers, arrows, colors, pictographs) to represent information.

- Use a set of command cards to create a logical sequence of actions.
- Read and act out a program constructed with command cards.

K-2.AP.C.1 Develop programs with sequences and simple loops, to express ideas or address a problem.

- Plan and develop a three-command sequence to accomplish a programming goal.
- Use a loop to repeat steps in a program.

K-2.AP.M.1 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.

- Identify and count the steps required to accomplish a programming goal.
- Select and order the commands to accomplish the programming goal.
- Program a precise sequence of instructions to accomplish the programming goal.
- Use whole numbers and decimal fractions when inputting command values.

K-2.AP.PD.1 Develop plans that represent a program's sequence of events, goals, and expected outcomes (e.g. visual representation: storyboard, graphic organizer, map).

- Use visual representations (i.e., organized lists, maps, and command cards) to make a plan to accomplish a task.
- Determine and record values needed for each command in the plan before programming and testing.

K-2.AP.PD.2 Give credit when using the ideas and creations (e.g. pictures, music, code) of others while developing programs.

- Share ideas for programming solutions with others.
- Credit others when using their ideas and solutions.

K-2.AP.PD.3 Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.

- Compare actual to intended programmed behavior.
- Identify the step(s) to correct when a programming goal is not accomplished.
- Correct commands for accuracy in accomplishing a programming goal.

K-2.AP.PD.4 Describe steps taken and choices made during program development.

- Discuss decisions with a partner throughout the process of planning, testing and refining a program.
- Reflect on the solutions to problems encountered and the number of trials needed to reach the programming goal.

COMPUTER SCIENCE: DATA AND ANALYSIS

K-2.DA.CVT.1a Collect and transform data using a digital device.

- Record data for a class data collection project using a digital device (i.e., digital camera, cell phone, iPad app, presentation software, spreadsheet).

K-2.DA.CVT.1b Display data for communication in various visual formats.

- Generate a visual display of a class data set using a digital tool (i.e., slide show, video, animation).
- Generate a graph of a class data set using a digital tool (i.e., spreadsheet, presentation software, application).

K-2.DA.IM.1 Describe patterns in data to make inferences or predictions.

- Identify a pattern in a displayed data set.
- Use a pattern to support an inference or prediction.
- Draw a conclusion from a collected and displayed data set.