

## Challenger Space Center - Astrobiology Adventure Educational Standards

<b>GRADE 3 - Standards (2005-06)</b>	<b>Supporting Program Elements</b>
<b>The Arts (1997)</b>	
VISUAL ARTS	
STANDARD 1: CREATING ART (Visual Arts)	
1AV-F1. Select and use subjects, themes and symbols in works of art	Drawing Microscope pictures
1AV-F8. Demonstrate responsible use of tools and materials	Drawing Microscope pictures
<b>Comprehensive Health (1997)</b>	
COMPREHENSIVE HEALTH	
STANDARD 5 - Students demonstrate the ability to use interpersonal skills to enhance health.	
5CH-F3. Describe ways to communicate care, consideration, and respect of self and others	Working as teams
5CH-F4. Demonstrate healthy ways to express needs, wants and feelings, and identify a variety of ways to deal with them constructively and appropriately	Working as teams
5CH-F5. Demonstrate attentive listening skills to build and maintain healthy relationships	Working as teams and hearing oral instructions
PHYSICAL ACTIVITY STANDARDS	
STANDARD 5 - Students develop self-initiated behaviors that promote effective personal and social interactions in physical activity settings.	
5PA-F3. Work cooperatively and productively with a partner or small group	Working as teams
5PA-F4. Work independently and on-task for short periods of time	Working on individual data logs for a series of tasks
5PA-F5. Interact with peers while participating in group activities	Working as teams
<b>Foreign and Native Language (1997)</b>	
<b>Reading Standard Articulated by Grade Level 2003 Grade 3</b>	
Strand 3: Comprehending Informational Text	
Concept 1: Expository Text - Identify, analyze, and apply knowledge of the purpose, structures, and elements of expository text.	

PO 5. Interpret information from graphic features (e.g., charts, maps, diagrams, illustrations, tables, timelines) of expository text. (Connected to Research Strand in Writing)	Mars Lat/Long, ChemCam spectra
<b>Writing (2004)</b>	
Strand 1: Writing Process	
Concept 1: Prewriting	
PO 1. Generate ideas through a variety of activities (e.g., brainstorming, graphic organizers, drawing, writer's notebook, group discussion, printed material).	Reaching conclusions based on research
PO 5. Maintain a record (e.g., lists, pictures, journals, folders, notebooks) of writing ideas.	Filling in Data Log
Concept 5: Publishing	
PO 4. Write legibly.	Filling in Data Log
Strand 2: Writing Elements	
Concept 1: Ideas and Content	
PO 1. Express ideas that are clear and directly related to the topic.	Writing conclusions at end of program
PO 2. Provide content and selected details that are well-suited to audience and purpose.	Support conclusions with data
PO 3. Use relevant details to provide adequate support for the ideas.	Support conclusions with data
Concept 4: Word Choice	
PO 1. Use a variety of specific and accurate words that effectively convey the intended message.	Use appropriate words and terminology in conclusion
PO 2. Use descriptive words and phrases that energize the writing.	Use appropriate words and terminology in conclusion
PO 3. Apply vocabulary and/or terminology appropriate to the type of writing.	Use appropriate words and terminology in conclusion
PO 4. Use literal and figurative language in a variety of ways (e.g., imitating, creating new words, rhyming), although may be inconsistent or experimental.	Use appropriate words and terminology in conclusion
Strand 3: Writing Applications	
Concept 2: Expository	
PO 1. Record information (e.g., observations, notes, lists, charts, map labels and legends) related to the topic.	Recording data on a Data Log

PO 2. Write an expository paragraph that contains: a. a topic sentence b. supporting details c. relevant information	Write summary of data
Concept 4: Persuasive	
PO 1. Write persuasive text (e.g., advertisements, paragraph) that attempts to influence the reader. (See R03-S3C3)	Argue point on whether or not the data indicates life
Concept 6: Research	
PO 1. Paraphrase information from at least one source (e.g., Internet, reference materials).	Collecting and recording data from multiple instruments
<b>Language Arts (1996)</b>	
<b>STANDARD 3: LISTENING AND SPEAKING</b>	
3LS-F1. Use effective vocabulary and logical organization to relate or summarize ideas, events and other information	Oral presentation at end of program
3LS-F2. Give and follow multiple-step directions	Many oral instructions and team activities
3LS-F3. Prepare and deliver information by generating topics; identifying the audience; and organizing ideas, facts or opinions for a variety of speaking purposes such as giving directions, relating personal experiences, telling a story or presenting a report	Oral presentation at end of program
<b>STANDARD 4: VIEWING AND PRESENTING</b>	
4VP-F3. Access, view and respond to visual forms such as computer programs, videos, artifacts, drawings, pictures and collages	Program presented as a PowerPoint presentation
4VP-F4. Interpret visual clues in cartoons, graphs, tables and charts that enhance the comprehension of text	Many forms of data: photos, numbers, sounds, graphs, etc.
<b>Mathematics Standard Articulated By Grade Level 2003 - Grade 3</b>	
Strand 1: Number Sense and Operations	
Concept 1: Number Sense	
PO1. Read whole numbers in contextual situations (through six-digit numbers)	Latitude/Longitude, temperatures, wind speeds, etc.
Strand 2: Data Analysis, Probability, and Discrete Mathematics	
Concept 1: Data Analysis (Statistics)	

PO2. Construct a horizontal bar, vertical bar, pictograph, or tally chart with appropriate labels and title from organized data	Graphing temperatures, wind speeds, create Venn diagram, etc.
PO3. Interpret data found in line plots, pictographs, and single-bar graphs (horizontal and vertical)	Graphing temperatures, wind speeds, create Venn diagram, etc.
PO4. Answer questions based on data found in line plots, pictographs, and single-bar graphs (horizontal and vertical)	Graphing temperatures, wind speeds, create Venn diagram, etc.
PO6. Solve problems using graphs, charts and tables	Graphing temperatures, wind speeds, create Venn diagram, etc.
Strand 3: Patterns, Algebra, and Functions	
Concept 4: Analysis of Change	
PO1. Identify the change in a variable over time (e.g., an object gets taller, colder, heavier)	Graphing changing temperatures and wind speeds
PO2. Make simple predictions based on a variable (e.g., increases in allowance as you get older)	
Strand 4: Geometry and Measurement	
Concept 3: Coordinate Geometry	
PO1. Identify points in the first quadrant of a grid using ordered pairs	Latitude and longitude, graphing temperature and wind speeds
Concept 4: Measurement - Units of Measure - Geometric Objects	
PO5. Record temperatures to the nearest degree in degrees Fahrenheit and degrees Celsius as shown on a thermometer	Recording and graphing yearly temperatures
<b>Science Standard Articulated by Grade Level 2004 - Grade 3</b>	
Strand 1: Inquiry Process	
Concept 1: Observation, Questions, and Hypotheses	
PO1. Formulate relevant questions about the properties of objects, organisms, and events of the environment using observations and prior knowledge	Throughout the program
Concept 2: Scientific Testing (Investigating and Modeling)	
PO1. Demonstrate safe behavior and appropriate procedures	Throughout the program

PO2. Plan a simple investigation based on the formulated questions	Yeast experiment
PO3. Conduct simple investigations in life, physical, and Earth and space sciences	Yeast experiment, data analysis from Mars instruments
PO4. Use metric and U.S. customary units to measure objects	Microscope calibration image
PO5. Record data in an organized and appropriate format	Record data in Data Logs
Concept 3: Analysis and Conclusions	
PO2. Construct reasonable interpretations of the collected data based on formulated questions	Write, record and send conclusions at the end
PO3. Compare the results of the investigation to predictions made prior to the investigation	Conclusion to yeast experiment
PO4. Generate questions for possible future investigations based on the conclusions of the investigation	Part of their final report
PO5. Record questions for further inquiry based on the conclusions of the investigation	Video recording of final report with recommendations for future studies
Concept 4: Communication	
PO1. Communicate investigations and explanations using evidence and appropriate terminology	Video recording of final report of conclusions
PO3. Communicate with other groups to describe the results of an investigation	Final class discussion, landing site selection
Strand 4: Life Science	
Concept 3: Organisms and Environments	
PO1. Identify the living and nonliving components of an ecosystem	Is It Alive activity
Concept 4: Diversity, Adaptation, and Behavior	
PO1. Identify adaptations of plants and animals that allow them to live in specific environments	Life in extreme environments discussion
PO2. Describe ways that species adapt when introduced to new environments	Life in extreme environments discussion
Strand 5: Physical Science	
Strand 6: Earth and Space Science	
Concept 1: Properties of Earth Materials	
PO2. Describe the different types of rocks and how they are formed (metamorphic, igneous and sedimentary)	ChemCam - types of rocks, Is It Alive discussion - concretions
PO4. Describe fossils as a record of past life forms	Looking for fossils in Microscope images

PO5. Describe how fossils are formed	Part of Is It Alive discussion - coprolites
<b>Social Studies (2000)</b>	
STANDARD 3: GEOGRAPHY	
3SS-F1. Construct and interpret maps and other geographic tools, including the use of map elements to organize information about people, places, and environments	Finding locations on Mars using latitude and longitude
PHYSICAL GEOGRAPHY	
Climate:	
6SC-F7. Measure and record changes in weather conditions	Record temperatures and wind speeds on Mars
Landforms:	
6SC-F1. Describe the basic Earth materials and their physical properties	Why Mars discussion/ ChemCam results
Biota:	
4SC-F4. Identify characteristics of plants and animals (including extinct organisms) that allow them to live in specific environments	Is It Alive discussion
<b>Technology (2000)</b>	
STANDARD 1: FUNDAMENTAL OPERATIONS AND CONCEPTS	
1T-F1. Communicate about internal technology operations using developmentally appropriate and accurate terminology	Discussion of Delta II rocket and instruments on the probe
1T-F3. Use developmentally appropriate technology resources to access information and communicate electronically	Use the computer to communicate with the head scientist
<b>Workplace Skills (1997)</b>	
Standard 1: Students use principles of effective oral, written and listening communication skills to make decisions and solve workplace problems	

1WP-F2. Respond to oral presentations by formulating relevant questions and opinions and summarizing accurately	Interaction between students and Flight Director, final discussion
1WP-F3. Apply critical listening skills (e.g., listening for content, long-term contexts, emotional meaning, following directions)	Many instructions are presented orally
1WP-F4. Listen to an oral presentation, evaluate and express an opinion orally	Many instructions are presented orally, final discussion of results, landing site selection
1WP-F5. Share ideas, opinions and information with a group, choosing vocabulary that communicates messages clearly, precisely and effectively	Final discussion and landing site selection
STANDARD 3 Students apply critical and creative thinking skills to make decisions and solve workplace problems.	
3WP-F1. Address a specific problem by specifying their goals, devising alternative solutions, considering the risks of each and choosing the best course of action	Landing site selection challenge
3WP-F4. Practice a variety of creative thinking skills to identify potential solutions to workplace issues	Required throughout the program
3WP-F5. Identify the need for data, obtaining it from existing sources such as the library, on-line databases or field research	Required throughout the program
3WP-F6. Describe possible solutions to a variety of problems	Required throughout the program
STANDARD 4 Students work individually and collaboratively within team settings to accomplish objectives.	
4WP-F1. Understand and demonstrate the importance of dependability, trustworthiness, productivity and initiative in all areas of life and when interacting with others	Required throughout the program
4WP-F3. Demonstrate teamwork skills by contributing ideas, suggestions and effort; resolving conflicts; and handling peer pressure	Required throughout the program

STANDARD 5 Students will demonstrate a set of marketable skills that enhance career options.	
5WP-F1. Explore areas of interests and possible work choices	End discussion includes possible careers
5WP-F2. Demonstrate ability to make decisions which contribute to a productive school and work ethic	Required throughout the program
5WP-F3. Demonstrate basic academic skills in reading, writing, listening, speaking and mathematics	Required throughout the program