Challenger Space Center - Astrobiology Adventure Educational Standards

GRADE 5 - Standards (2005-06)	**Supporting Program Elements**
The Arts (1997) (Grades 4 & 5 identical)	
VISUAL ARTS	
STANDARD 1: CREATING ART (Visual Arts)	
1AV-E1. Choose the most appropriate media, techniques, and processes to enhance communication of one's own ideas and experiences	Drawing Microscope pictures
STANDARD 5 - Students demonstrate the ability to use interpersonal skills to enhance health.	
5CH-E1. Demonstrate ways to communicate care, consideration and respect of self and others	Working as teams
5CH-E3. Demonstrate strategies to manage conflict in healthy ways	Working as teams
STANDARD 5 - Students develop self-initiated behaviors that promote effective personal and social interactions in physical activity settings.	
5PA-E3. Cooperate with a group to achieve group goals in competitive as well as cooperative settings	Working as teams
Comprehensive Health Standards (1997) - (Grades 4 & 5 identical)	
COMPREHENSIVE HEALTH	
STANDARD 5 - Students demonstrate the ability to use interpersonal skills to enhance health.	
5CH-E1. Demonstrate ways to communicate care, consideration and respect of self and others	Working as teams
5CH-E3. Demonstrate strategies to manage conflict in healthy ways	Working as teams
PHYSICAL ACTIVITY STANDARDS	
STANDARD 5 - Students develop self-initiated behaviors that promote effective personal and social interactions in physical activity settings.	
5PA-E3. Cooperate with a group to achieve group goals in competitive as well as cooperative settings	Working as teams

Reading Standard Articulated by Grade Level 2003 Grade 5	
Strand 3: Comprehending Informational Text	
Concept 1: Expository Text	
PO 6. Interpret information from graphic features (e.g., charts, maps, diagrams, illustrations, tables, timelines) in expository text. (Connected to Research Strand in Writing)	Mars Lat/Long, ChemCam spectra
Writing Standard Articulated by Grade Level 2004 Grade 5	
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, journal, folder, notebook) of writing ideas.	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 where appropriate to purpose. (See R05-S1C4-03, -04)	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, paragraphs) that attempts to influence the reader. (See R05-S3C3)	Argue point on whether or not the data indicates life
Concept 6: Research	
PO 1. Paraphrase information from a variety of sources (e.g., Internet, reference materials). (See R05-S3C1-04, -05, -06)	Collecting and recording data from multiple instruments
Language Arts 1996 Writing (1996) Listening and Speaking Viewing and Presenting	
STANDARD 3: LISTENING AND SPEAKING	
LS-E2. Prepare and deliver an oral report in a content area and effectively convey the information through verbal and nonverbal communications with a specific audience	Oral presentation at end of program
Mathematics Standard Articulated By Grade Level 2003 - Grade 5	
Strand 1: Number Sense and Operations	
Concept 1: Number Sense	
PO 1. Make models that represent improper fractions.	Latitude/Longitude, temperatures, wind speeds, etc.
Strand 2: Data Analysis, Probability, and Discrete Mathematics	
Concept 1: Data Analysis (Statistics)	
PO 2. Construct a double-bar graph, line plot, frequency table, or three-set Venn diagram with appropriate labels and title from organized data.	Graphing temperatures, wind speeds, create Venn diagram, etc.
PO 3. Interpret graphical representations and data displays including bar graphs (including double-bar), circle graphs, frequency tables, three-set Venn diagrams, and line graphs that display continuous data.	Graphing temperatures, wind speeds, create Venn diagram, etc.

PO 4. Answer questions based on graphical representations, and data displays including bar graphs (including double-bar), circle graphs, frequency tables, three-set Venn diagrams, and line graphs that display continuous data.	Graphing temperatures, wind speeds, create Venn diagram, etc.
PO 7. Compare two sets of data related to the same investigation.	Compare temperatures, wind speeds, rock types, microscopic features
PO 8. Solve contextual 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	
PO 1. Describe patterns of change: • constant rate (speed of movement of the hands on a clock), and • increasing or decreasing rate (rate of plant growth).	Graphing changing temperatures and wind speeds
Strand 4: Geometry and Measurement	
Concept 3: Coordinate Geometry	
PO 1. Graph points in the first quadrant on a grid using ordered pairs.	Latitude and longitude, graphing temperature and wind speeds
Science Standard Articulated by Grade Level 2004 - Grade 5	
Strand 1: Inquiry Process	
Concept 1: Observations, Questions, and Hypotheses	
PO 1. Formulate a relevant question through observations that can be tested by an investigation. (See M05-S2C1-01)	Asked for ideas for future follow up investigations
Concept 2: Scientific Testing (Investigating and Modeling)	
PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.	Throughout the program
PO 2. Plan a simple investigation that identifies the variables to be controlled.	Yeast experiment
PO 3. Conduct simple investigations (e.g., related to forces and motion, Earth processes) based on studentdeveloped questions in life, physical, and Earth and space sciences.	Yeast experiment, data analysis from Mars instruments

PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log). (See W05-S3C2-01 and W05-S3C3-01)	Record data in Data Logs
Concept 3: Analysis and Conclusions	
PO 1. Analyze data obtained in a scientific investigation to identify trends and form conclusions. (See M05-S2C1-03)	Observe, record and analyze data presented in the program
PO 2. Analyze whether the data is consistent with the proposed explanation that motivated the investigation.	Analysis of collected data at the end - final discussion and report
PO 3. Evaluate the reasonableness of the outcome of an investigation.	Analysis of collected data at the end - final discussion and report
PO 4. Develop new investigations and predictions based on questions that arise from the findings of an investigation.	Part of their final report
PO 5. Identify possible relationships between variables in simple investigations (e.g., time and distance; incline and mass of object).	Conclusion to yeast experiment
Concept 4: Communication	
PO 1. Communicate verbally or in writing the results of an inquiry. (See W05-S3C3-01)	Video recording of final report of conclusions
PO 3. Communicate with other groups or individuals to compare the results of a common investigation.	Final class discussion, landing site selection
Strand 6: Earth and Space Science	
Concept 3: Earth in the Solar System	
PO 1. Identify the known planets of the solar system.	Why Mars discussion
PO 2. Describe the distinguishing characteristics of the known planets in the solar system.	Why Mars discussion
PO 6. Describe efforts to explore space (e.g., Apollo missions, space shuttles, Hubble space telescope, space probes). (See Strand 2)	Simulation built around the landing of an unmanned space probe on Mars
Social Studies Standards 2000 Essentials (Grades 4-8)	
PHYSICAL GEOGRAPHY	
ESSENTIALS (Grades 4-8)	
Landforms:	

6SC-E3. Describe the composition (including the formation of minerals, rocks, and soil) and the structure of the Earth	Why Mars discussion/ ChemCam results
Technology Standards 2000 Essentials (Grades 4-8)	
STANDARD 1: FUNDAMENTAL OPERATIONS AND CONCEPTS	
1T-E1. Communicate about technology using developmentally appropriate and accurate terminology	Discussion of Delta II rocket and instruments on the probe
Workplace Skills 1997 Essentials (Grades 4-8)	
STANDARD 1 Students use principles of effective oral, written and listening communication skills to make decisions and solve workplace problems.	
1WP-E1. Deliver a speech clearly, with expression and in an organized fashion, making eye contact with audience, and convey the message through nonverbal as well as verbal communications	Recording final report of conclusions
1WP-E4. Respond to oral and written presentations by formulating relevant feedback, expressing opinions, discerning the main idea and distinguishing fact from opinion	Many instructions are presented orally, final discussion of results, landing site selection
1WP-E6. Speak in a content area (e.g., science, social studies, literature), using vocabulary of the subject accurately; locate and interpret information in documents such as manuals, graphs, and schedules	Landing site selection, final discussion and final video report
STANDARD 2 Students apply computation skills and data analysis techniques to make decisions and solve workplace problems.	
2WP-E1. Apply math standards 1-6 to a variety of workplace scenarios	Applying math standards to help complete the activity
STANDARD 3 Students apply critical and creative thinking skills to make decisions and solve workplace problems.	

3WP-E1. Utilize information acquired from several sources and transfer information learned in one situation to another	Final conclusions based on information from many instruments, in-class experiments and learned facts
3WP-E3. Generate alternatives, consider risks, evaluate and choose solutions	Landing site selection challenge
3WP-E4. Monitor progress and make adjustment to meet stated objectives	Required throughout the program
3WP-E6. Identify a need for data, obtain it and develop a validation instrument for determining its accuracy	Required throughout the program
STANDARD 4 Students work individually and collaboratively within team settings to accomplish objectives.	
4WP-E1. Identify ways to build mutual trust and respect and develop an action plan for negotiating concerns	Required throughout the program
4WP-E3. Exert a high level of effort and perseverance toward goal attainment, as a team member	Required throughout the program
STANDARD 5 Students will demonstrate a set of marketable skills that enhance career options.	
5WP-E1. Evaluate areas of interest and/or potential career choices	End discussion includes possible careers
5WP-E2. Demonstrate work ethics and behaviors for success as defined by school and community	Required throughout the program
5WP-E3. Demonstrate the connection between academic skills and career pathways by identifying required education and training to achieve career choice(s)	Required throughout the program