APPENDIX | Where to Find Specific Mathematics Content

Mission 1 - Measure: Discover and use a function, solve for a variable, metric measurement, inequalities, time, mean, mode, median, and range

Mission 2 - Graph and Predict: Make a table, graph and interpret a linear function equation, slope-intercept model, y-intercept, best fitting line, interpret random events, metric measurement, and time

EXPLORATION EXTENSION 1 - Laser Altimeter: Make a table, graph and interpret a graph, area of a polygon, solve for a variable, metric measurement, and time

Mission 3 - Turns and Mazes: Application of DERT formula, metric measurement, time, Pythagorean Theorem, degrees in triangle, and fractals

EXPLORATION EXTENSION 2 - Crawler-Transporter: Measurement and conversion

Mission 4 - Circles: Pi, diameter, radius, chord, tangent line, circumference, area, translation, rotation, reflection, and use a formula

Mission 5 - Game Spinner: Probability, interpret data from events, integers, order of operation, and multiple calculations

Mission 6 - Game Day: Fun applications and experimentation with the above

Mission 7 - $E=mc^2$: Standard and scientific notation, exponents, apply and interpret a formula

EXPLORATION EXTENSION 3 - Mission Patches and Demos: Measurement

Mission 8 - Cool Stuff: Graph linear, quadratic, absolute value, and radical equations, and create a solution table

Mission 9 - Mission to Mars: Functions and estimations

Mission 10 - Popbots: Final assessment

APPENDIX National Content Standards for Mathematics: Grades 6-8

Content Standard	Objectives	Correlating Mission(s)
Number and Operations Understand numbers, ways of representing numbers, relationships among numbers, and number systems.	• Work flexibly with fractions, decimals, and percents to solve problems.	Mission 1 and 2
	• Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.	Mission 7
	• Develop meaning for integers and represent and compare quantities with them.	Mission 5
Number and Operations Understand meanings of operations and how they relate to one another.	• Understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems.	Missions 1-5, 7-10, Exploration Extensions 1, 2
Number and Operations Compute fluently and make reasonable estimates.	• Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods.	Missions 1-10, Exploration Extensions 1-3
	• Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.	Missions 1-10, Exploration Extensions 1-3
Algebra Understand patterns, relations, and functions	• Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules.	Missions 1-10, Exploration Extension 1
	• Relate and compare different forms of representation for a relationship.	Missions 1-4, 7, 8, and 10, Exploration Ext. 1
	• Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.	Missions 1, 2, 8, and 10
Algebra Represent and analyze mathematical situations and structures using algebraic symbols	• Develop an initial conceptual understanding of different uses of variables.	Missions 1-5, 7, 8, and 10, Exploration Ext. 1
	• Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope.	Mission 2
	• Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.	Missions 1, 2, 4, and 8
	• Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.	Missions 1, 2, 4, and 8
Algebra Use mathematical models to represent and understand quantitative relationships.	• Model and solve contextualized problems using various representations, such as graphs, tables, and equations.	Missions 1-5, 7, 8, and 10, Exploration Ext. 1, 2

APPENDIX National Content Standards for Mathematics: Grades 6-8

Content Standard	Objectives	Correlating Mission(s)
Algebra Analyze change in various contexts.	• Use graphs to analyze the nature of changes in quantities in linear relationships.	Missions 2 and 8
Geometry Use visualization, spatial reasoning, and geometric modeling to solve problems.	• Use geometric models to represent and explain numerical and algebraic relationships.	Mission 3
	• Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.	Mission 3
Measurement Understand measurable attributes of objects and the units, systems, and processes of measurement.	• Understand both metric and customary systems of measurement.	Missions 1 and 10
	• Understand relationships among units and convert from one unit to another within the same system.	Missions 1, 2, 4, 7, and 10, Exploration Ext. 1, 2
	• Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.	Missions 4 and 10
Measurement Apply appropriate techniques, tools, and formulas to determine measurements.	• Use common benchmarks to select appropriate methods for estimating measurements.	Missions 1-4, and 9, Exploration Ext. 1, 2
	• Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision.	Missions 1-4, and 10, Exploration Ext. 1, 2
	• Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes.	Missions 4 and 10
	• Solve simple problems involving rates and derived measurements for such attributes as velocity and density.	Missions 1-3, and 10, Exploration Ext. 1, 2
Data Analysis and Probability Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them	• Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population.	Mission 1
	• Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.	Mission 1
Data Analysis and Probability Select and use appropriate statistical methods to analyze data.	• Find, use, and interpret measures of center and spread, including mean and interquartile range.	Mission 1

APPENDIX National Content Standards for Mathematics: Grades 6-8

Content Standard	Objectives	Correlating Mission(s)
Data Analysis and Probability Select and use appropriate statistical methods to analyze data.	• Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.	Mission 1
Data Analysis and Probability Understand and apply basic concepts of probability.	• Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations; compute probabilities for simple compound events.	Mission 5

Selected from *Principles & Standards for School Mathematics* sponsored by the National Council of Teachers of Mathematics
http://standards.nctm.org/document/chapter6/index.htm

APPENDIX National Process Standards for Mathematics: Grades 6-8

Process Standard	Objectives	Correlating Mission(s)
Problem Solving Standard	• Build new mathematical knowledge through problem solving.	Missions 1-10, Exploration Extensions 1-3
	• Solve problems that arise in mathematics and in other contexts.	Missions 1-10, Exploration Extensions 1-3
	• Apply and adapt a variety of appropriate strategies to solve problems.	Missions 1-10, Exploration Extensions 1-3
	• Monitor and reflect on the process of mathematical problem solving.	Missions 1-10, Exploration Extensions 1-3
Communication Standard	• Organize and consolidate their mathematical thinking through communication.	Missions 1-10, Exploration Extensions 1-3
	• Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	Missions 1-10, Exploration Extensions 1-3
	• Analyze and evaluate the mathematical thinking and strategies of others.	Missions 1-10, Exploration Extensions 1-3
	• Use the language of mathematics to express mathematical ideas precisely.	Missions 1-10, Exploration Extensions 1-3
Connection Standard	• Recognize and use connections among mathematical ideas.	Missions 1-10, Exploration Extensions 1-3
	• Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Missions 1-10, Exploration Extensions 1-3
	• Recognize and apply mathematics in contexts outside of mathematics.	Missions 1-10, Exploration Extensions 1-3
Representation Standard	• Create and use representations to organize, record, and communicate mathematical ideas.	Missions 1-10, Exploration Extensions 1-3
	• Select, apply, and translate among mathematical representations to solve problems.	Missions 1-10, Exploration Extensions 1-3
	• Use representations to model and interpret physical, social, and mathematical phenomena.	Missions 1-10, Exploration Extensions 1-3

Selected from *Principles & Standards for School Mathematics* sponsored by the National Council of Teachers of Mathematics
http://standards.nctm.org/document/chapter6/index.htm

APPENDIX National Content Standards for Science: Grades 5-8

Content Standard	Objectives	Correlating Mission(s)
Science as Inquiry Abilities necessary to do scientific inquiry	• Identify questions that can be answered through scientific investigations.	Missions 1 and 2, Exploration Extension 1
	• Design and conduct a scientific investigation.	Missions 1 and 2, Exploration Extension 1
	• Use appropriate tools and techniques to gather, analyze, and interpret data.	Missions 1-5, 7-9, Exploration Extensions 1, 2
	• Develop descriptions, explanations, predictions, and models using evidence.	Missions 1-5, 7-9, Exploration Extensions 1, 2
	• Think critically and logically to make the relationships between evidence and explanations.	Missions 1-5, 7-9, Exploration Extensions 1, 2
	• Recognize and analyze alternative explanations and predictions.	Missions 1-5, 7-9, Exploration Extensions 1, 2
	• Communicate scientific procedures and explanations.	Missions 1-5, 7-9, Exploration Extensions 1, 2
	• Use mathematics in all aspects of scientific inquiry.	Missions 1-5, 7-10, Exploration Extensions 1, 2
Science as Inquiry Understandings about scientific inquiry	• Mathematics is important in all aspects of scientific inquiry.	Missions 1-5, 7-10, Exploration Extensions 1, 2
	• Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations.	Missions 1-5, 7-9, Exploration Extensions 1, 2
	• Scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data.	Mission 7, Exploration Extensions 1
Science and Technology Abilities of technology design	• Design a solution or product.	Exploration Extension 2
	• Implement a proposed design.	Exploration Extension 2
	• Evaluate completed technological designs or products.	Exploration Extension 2
	• Communicate the process of technological design.	Exploration Extensions 2, 3

APPENDIX National Content Standards for Science: Grades 5-8

Content Standard	Objectives	Correlating Mission(s)
Science in Personal and Social Perspectives: Personal Health	* The potential for accidents and the existence of hazards imposes the need for injury prevention.	Missions 1-10, Exploration Extensions 1-3
Science in Personal and Social Perspectives: Science and Technology in Society	* Science influences society through its knowledge and world view.	Mission 7
	* Technology influences society through its products and processes.	Mission 7

Selected from *National Science Education Standards* authored by The National Committee on Science Education Standards and Assessment, National Research Council
http://www.nap.edu/readingroom/books/nses/6d.html

APPENDIX National Educational Technology Standards for Students

Technology Standard	Grades 6-8 Performance Indicators	Correlating Mission(s)
Standard 1 - Basic Operation and Concepts: Students demonstrate a sound understanding of the nature and operation of technology systems. Students are proficient in the use of technology.	1. Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use. 9. Demonstrate an understanding of concepts underlying hardware, software, connectivity, and of practical applications to learning and problem solving.	Missions 1-10, Exploration Extensions 1 and 2
Standard 3 - Technology Productivity Tools: Students use technology tools to enhance learning, increase productivity, and promote creativity. Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.	4. Use content-specific tools, software, and simulations (e.g., environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.	Missions 1-10, Exploration Extensions 1 and 2
Standard 5 - Technology Research Tools: Students use technology to locate, evaluate, and collect information from a variety of sources. Students use technology tools to process data and report results. Students evaluate and select new information resources and technological innovations based on the appropriateness for specific tasks.	7. Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. 8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.	Missions 1-10, Exploration Extensions 1 and 2
Standard 6 - Technology Problem-Solving and Decision-Making: Students use technology resources for solving problems and making informed decisions. Students employ technology in the development of strategies for solving problems in the real world.	8. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems. 9. Demonstrate an understanding of concepts underlying hardware, software, connectivity, and of practical applications to learning and problem solving.	Missions 1-10, Exploration Extensions 1 and 2

Reprinted with permission from *National Educational Technology Standards for Students: Connecting Curriculum and Technology*, © 2000, ISTE® (International Society for Technology in Education), iste@iste.org, www.iste.org. All rights reserved.

APPENDIX Standards for English Language Arts

Standards	Correlating Mission(s)
1. Students read a wide range of print and non-print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment. Among these texts are fiction and nonfiction, classic and contemporary works.	Missions 1-10, Exploration Extensions 1-3
3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features (e.g., sound-letter correspondence, sentence structure, context, graphics).	Missions 1-10, Exploration Extensions 1-3
4. Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.	Exploration Extensions 3
7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.	Missions 1-10, Exploration Extensions 1-3
8. Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.	Missions 1-10, Exploration Extensions 1-3
11. Students participate as knowledgeable, reflective, creative, and critical members of a variety of literacy communities.	Missions 1-10, Exploration Extensions 1-3
12. Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).	Missions 1-10, Exploration Extensions 1-3

Selected from *Standards for the English Language Arts* sponsored by The International Reading Association and the National Council of Teachers of English http://www.ncte.org/about/over/standards/110846.htm