

# **City Sights!: FIRST™ LEGO® League Challenge 2002**

## **And the Educational Standards**

Prepared for FIRST LEGO LEAGUE by the [Wisconsin Creative Problem Solving Programs at the University of Wisconsin](#).

FIRST™ LEGO® League promotes creative problem solving and inspires students to learn and understand more about science and technology. There is a certain amount of rigor that successful teams must apply to their research in the challenge topic, and in learning how to build and program a robot. Much of what team members do cut across disciplines or curricular boundaries.

Examining the 2002 challenge, *City Sights!* It became clear that teams that did even the minimal amount of work to meet the challenge for competition would also meet many of the federal and state educational standards. Here is a list of some of the standards that teams might meet while pursuing a solution to *City Sights!* In constructing this list, we drew on the national compendium of standards created at the Mid-Continent Research for Education and Learning group (McREL), a national educational research laboratory in Aurora, Colorado. You can browse the McREL compendium and search it on-line by visiting their website at the following address: <http://www.mcrel.org/standards-benchmarks/>. We hope this helps you as a coach, parent or educator to understand how much teams are actually learning while having fun!

### **Educational Standards as applied to FIRST™ LEGO® League**

#### Behavioral Studies Standards

- Standard 1: Understands that group and cultural influences contribute to human development, identity, and behavior.
- Standard 2: Understands various meanings of social group, general implications of group membership, and different ways that groups function.
- Standard 4: Understands conflict, cooperation, and interdependence among individuals, groups, and institutions.

#### Civics Standards

- Standard 1: Understands ideas about civic life, politics, and government

#### Economics Standards

- Standard 1: Understands that scarcity of productive resources requires choices that generate opportunity costs.
- Standard 2: Understands characteristics of different economic systems, economic institutions, and economic incentives.
- Standard 3: Understands the concept of prices and the interaction of supply and demand in a market economy.
- Standard 4: Understands basic features of market structures and exchanges.

### Geography Standard

- Standard 1: Understands the characteristics and uses of maps, globes, and other geographic tools and technologies.
- Standard 2: Knows the location of places, geographic features, and patterns of the environment.
- Standard 3: Understands the characteristics and uses of spatial organization of Earth's surface.
- Standard 4: Understands the physical and human characteristics of place.
- Standard 5: Understands the concept of regions.
- Standard 6: Understands that culture and experience influence people's perceptions of places and regions.
- Standard 10: Understands the nature and complexity of Earth's cultural mosaics.
- Standard 11: Understands the patterns and networks of economic interdependence on Earth's surface.
- Standard 12: Understands the patterns of human settlement and their causes.
- Standard 13: Understands the forces of cooperation and conflict that shape the divisions of Earth's surface.
- Standard 14: Understands how human actions modify the physical environment.
- Standard 15: Understands how physical systems affect human systems.
- Standard 16: Understands the changes that occur in the meaning, use, distribution and importance of resources.

### Health Standards

- Standard 2: Knows environmental and external factors that affect individual and community health.

### History Standards

- Standard 1: Understands and knows how to analyze chronological relationships and patterns.
- Standard 2: Understands the historical perspective.

### Language Arts: Listening and Speaking Standards

- Standard 8: Uses listening and speaking strategies for different purposes

### Language Arts: Media

- Standard 10: Understands the characteristics and components of the media.

### Language Arts: Reading

- Standard 5: Uses the general skills and strategies of the reading process.
- Standard 7: Uses reading skills and strategies to understand and interpret a variety of informational texts.

### Language Arts: Viewing

- Standard 9: Uses viewing skills and strategies to understand and interpret visual media.

### Language Arts: Writing

- Standard 1: Uses the general skills and strategies of the writing process.
- Standard 2: Uses the stylistic and rhetorical aspects of writing.

- Standard 3: Uses grammatical and mechanical conventions in written compositions.  
Standard 4: Gathers and uses information for research purposes.

#### Life Work Standards

- Standard 1: Makes effective use of basic tools.  
Standard 2: Uses various information sources, including those of a technical nature, to accomplish specific tasks.  
Standard 3: Manages money effectively.  
Standard 7: Displays reliability and a basic work ethic.  
Standard 8: Operates effectively within organizations.

#### Thinking and Reasoning Standards

- Standard 1: Understands and applies the basic principles of presenting an argument.  
Standard 2: Understands and applies basic principles of logic and reasoning.  
Standard 3: Effectively uses mental processes that are based on identifying similarities and differences.  
Standard 4: Understands and applies basic principles of hypothesis testing and scientific inquiry.  
Standard 6: Applies decision-making techniques.

#### Working With Others Standards

- Standard 1: Contributes to the overall effort of a group.  
Standard 2: Uses conflict-resolution techniques,  
Standard 3: Works well with diverse individuals and in diverse situations.  
Standard 4: Displays effective interpersonal communication skills.  
Standard 5: Demonstrates leadership skills.

#### Mathematics Standards

- Standard 1: Uses a variety of strategies in the problem-solving process.  
Standard 2: Understands and applies basic and advanced properties of the concepts of numbers.  
Standard 5: Understands and applies basic and advanced properties of the concepts of geometry.

#### Science: Nature of Science Standards

- Standard 11: Understands the nature of scientific knowledge.  
Standard 12: Understands the nature of scientific inquiry.

#### Science: Physical Science Standards

- Standard 9: Understands the sources and properties of energy.  
Standard 10: Understands forces and motion.

#### Self-Regulation Standards

- Standard 1: Sets and manages goals.  
Standard 2: Performs self-appraisal.  
Standard 3: Considers risks.  
Standard 4: Demonstrates perseverance.  
Standard 5: Maintains a healthy self-concept.  
Standard 6: Restrains impulsivity.

### Technology Standards

- Standard 1: Knows the characteristics and uses of computer hardware and operating systems.
- Standard 2: Knows the characteristics and uses of computer software programs.
- Standard 3: Understands the relationships among science, technology, society, and the individual.
- Standard 4: Understands the nature of technological design.
- Standard 5: Understands the nature and operation of systems.
- Standard 6: Understands the nature and uses of different forms of technology.

### Theater Standards

- Standard 1: Demonstrates competence in writing scripts.
- Standard 2: Uses acting skills.

### Visual Art Standards

- Standard 2: Knows how to use structures (e.g., sensory qualities, organizational principles, expressive features) and functions of art.
- Standard 3: Knows a range of subject matter, symbols, and potential ideas in the visual arts.

### Art Connections Standards

- Standard 1: Understands connections among the various art forms and other disciplines.