Summer Institute for Teachers
In Partnership with
Hands On: Real World Lessons for Middle School Classrooms at the University of Tennessee

Transportation: Learning on the Move:
An interdisciplinary, hands-on thematic unit aligned with SC Curriculum Standards

June 29 & June 30, 2010 from 9:00 AM – 4:00 PM (Lunch provided each day)
$225 stipend: The $25 registration fee and $225 stipend result in a net payment of $200
Visit http://rpsec.usca.edu/CE-MIST/TranspRegistration2010.pdf for registration information

Transportation: Learning on the Move is an interdisciplinary instructional unit that ties high-energy, hands-on lessons that are project based directly to state content standards in math, science, language arts, and social studies at the middle school level. Students will explore concepts of creative writing, the engineering process, force and motion, and map skills while learning about careers in transportation. The unit ties classroom instruction to students’ daily lives and demonstrates the relevance of those real-world connections in learning state-mandated concepts.

CE-MIST is funded by the South Carolina Commission on Higher Education through the Education Improvement Act under the Education Oversight Committee.

The South Carolina Curriculum Standards listed below are for planning purposes. The final standards included in the workshop might vary slightly.

Science:

6th Grade:

Standard 6-1: The student will demonstrate an understanding of technological design and scientific inquiry, including process skills, mathematical thinking, controlled investigative design and analysis, and problem solving.

6-1.1 Use appropriate tools and instruments (including a spring scale, beam balance, barometer, and sling psychrometer) safely and accurately when conducting a controlled scientific investigation.

6-1.2 Use a technological design process to plan and produce a solution to a problem or a product (including identifying a problem, designing a solution or a product, implementing the design, and evaluating the solution or the product).

7th Grade:

Standard 7-1: The student will demonstrate an understanding of technological design and scientific inquiry, including process skills, mathematical thinking, controlled investigative design and analysis, and problem solving.

7-1.1 Use appropriate tools and instruments (including a microscope) safely and accurately when conducting a controlled scientific investigation.
7-1.2 Generate questions that can be answered through scientific investigation.
7-1.3 Explain the reasons for testing one independent variable at a time in a controlled scientific investigation.
7-1.4 Explain the importance that repeated trials and a well-chosen sample size have with regard to the validity of a controlled scientific investigation.
7-1.5 Explain the relationships between independent and dependent variables in a controlled scientific investigation through the use of appropriate graphs, tables, and charts.

8th Grade:

Standard 8-1: The student will demonstrate an understanding of technological design and scientific inquiry, including process skills, mathematical thinking, controlled investigative design and analysis, and problem solving.

Math:

6th Grade:

Standard 6-4: The student will demonstrate through the mathematical processes an understanding of shape, location, and movement within a coordinate system; similarity, complementary, and supplementary angles; and the relationship between line and rotational symmetry.

6-4.1 Represent with ordered pairs of integers the location of points in a coordinate grid.

Standard 6-5: The student will demonstrate through the mathematical processes an understanding of surface area; the perimeter and area of irregular shapes; the relationships among the circumference, diameter, and radius of a circle; the use of proportions to determine unit rates; and the use of scale to determine distance.

6-5.6 Use proportions to determine unit rates.

7th Grade:

Standard 7-2: The student will demonstrate through the mathematical processes an understanding of the representation of rational numbers, percentages, and square roots of perfect squares; the application of ratios, rates, and proportions to solve problems; accurate, efficient, and generalizable methods for operations with integers; the multiplication and division of fractions and decimals; and the inverse relationship between squaring and finding the square roots of perfect squares.

7-2.5 Apply ratios, rates, and proportions to discounts, taxes, tips, interest, unit costs, and similar shapes.

7-2.8 Generate strategies to add, subtract, multiply, and divide integers.
Standard 7-4: The student will demonstrate through the mathematical processes an understanding of proportional reasoning, tessellations, the use of geometric properties to make deductive arguments, the results of the intersection of geometric shapes in a plane, and the relationships among angles formed when a transversal intersects two parallel lines.

7-4.1 Analyze geometric properties and the relationships among the properties of triangles, congruence, similarity, and transformations to make deductive arguments.

8th Grade:

Standard 8-1: The student will understand and utilize the mathematical processes of problem solving, reasoning and proof, communication, connections, and representation.

8-1.1 Generate and solve complex abstract problems that involve modeling physical, social, or mathematical phenomena.

8-1.6 Use correct and clearly written or spoken words, variables, and notations to communicate about significant mathematical tasks.

8-1.7 Generalize connections among a variety of representational forms and real-world situations.

Standard 8-2: The student will demonstrate through the mathematical processes an understanding of operations with integers, the effects of multiplying and dividing with rational numbers, the comparative magnitude of rational and irrational numbers, the approximation of cube and square roots, and the application of proportional reasoning.

8-2.7 Apply ratios, rates, and proportions.

Standard 8-3: The student will demonstrate through the mathematical processes an understanding of equations, inequalities, and linear functions.

8-3.6 Identify the coordinates of the x- and y-intercepts of a linear equation from a graph, equation, and/or table.

8-3.7 Identify the slope of a linear equation from a graph, equation, and/or table.

Standard 8-4: The student will demonstrate through the mathematical processes an understanding of the Pythagorean theorem; the use of ordered pairs, equations, intercepts, and intersections to locate points and lines in a coordinate plane; and the effect of a dilation in a coordinate plane.

8-4.2 Use ordered pairs, equations, intercepts, and intersections to locate points and lines in a coordinate plane.

Standard 8-5: The student will demonstrate through the mathematical processes an understanding of the proportionality of similar figures; the necessary levels of accuracy and precision in measurement; the use of formulas to determine circumference, perimeter, area, and volume; and the use of conversions within and between the U.S. Customary System and the metric system.

8-5.1 Use proportional reasoning and the properties of similar shapes to determine the length of a missing side
English Language Arts:

**6th Grade:**

Standard 6-3 The student will use word analysis and vocabulary strategies to read fluently.

6-3.1 Use context clues (for example, those that provide an example, a definition, or restatement) to generate the meanings of unfamiliar and multiple-meaning words.

Standard 6-4 The student will create written work that has a clear focus, sufficient detail, coherent organization, effective use of voice, and correct use of the conventions of written Standard American English.

Standard 6-5 The student will write for a variety of purposes and audiences.

6-5.1 Create informational pieces (for example, brochures, pamphlets, and reports) that use language appropriate for the specific audience.

6-5.4 Create persuasive writings (for example, print advertisements and commercial scripts) that develop a central idea with supporting evidence and use language appropriate for the specific audience.

**7th Grade:**

Standard 7-2 The student will read and comprehend a variety of informational texts in print and nonprint formats.

7-2.7 Identify the use of propaganda techniques (including glittering generalities and name calling) in informational texts.

Standard 7-3 The student will use word analysis and vocabulary strategies to read fluently.

7-3.1 Use context clues (for example, those that provide an example, a definition, a restatement, or a comparison/contrast) to generate the meanings of unfamiliar and multiple-meaning words.

Standard 7-5 The student will write for a variety of purposes and audiences.

7-5.1 Create informational pieces (for example, book, movie, or product reviews and news reports) that use language appropriate for a specific audience.

7-5.4 Create persuasive pieces (for example, letters to the editor or essays) that include a stated position with supporting evidence for a specific audience.

**8th Grade:**

Standard 8-2 The student will read and comprehend a variety of informational texts in print and nonprint formats.

8-2.7 Identify the use of propaganda techniques (including card stacking, plain folks, and transfer) in informational texts.

Standard 8-3 The student will use word analysis and vocabulary strategies to read fluently.

8-3.1 Use context clues (for example, those that provide an example, a definition, a restatement, or a comparison/contrast) to generate the meanings of unfamiliar and multiple-meaning words.

Standard 8-5 The student will write for a variety of purposes and audiences.

8-5.3 Create descriptions for use in other modes of written works (for example, narrative, expository, and persuasive).

8-5.4 Create persuasive pieces (for example, editorials, essays, or speeches) that support a clearly stated position with concrete evidence.
Social Studies:

Standard 8-4: The student will demonstrate an understanding of the impact of Reconstruction on the people and government of South Carolina.

8-4.1 Explain the purposes of Reconstruction with attention to the economic, social, political, and geographic problems facing the South, including reconstruction of towns, factories, farms, and transportation systems; the effects of emancipation; racial tension; tension between social classes; and disagreement over voting rights.

Standard 8-5: The student will demonstrate an understanding of major social, political, and economic developments that took place in the United States during the second half of the nineteenth century.

8-5.4 Compare migration patterns within South Carolina and in the United States as a whole in the late nineteenth century, including the population shift from rural to urban areas, migration between regions of the United States, the westward expansion, and the motivations for migration and settlement.