New Mexico STEM Ready! CONNECT

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Implementing the NM STEM Ready! Science Standards

Did You Know?

Teachers participating in the Early Implementers Initiative in California identified ELA strategies successfully used in their classrooms to integrate ELA and science.

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Integration of Practices

A Framework for K–12 Science Education sets forth the vision of creating a scientifically literate citizenry of tomorrow that engage in public discussions around scientific issues and are critical consumers of information. Realizing this vision starts with K–12 students engaging in practicing science with mathematics and language arts integration. Research at Stanford University show the convergences between the Science and Engineering Practices, the Standards for Math Practices, and the ELA Capacities. Common practices between the three subjects include engaging in argument from evidence; obtaining, evaluating, and communicating information; and refining models to understand phenomena.

Integration of Science with Mathematics

In both science and mathematics, models help students understand physical phenomena or solve problems that occur in everyday life; models include diagrams, drawings, mathematical representations, and computer simulations. Students could use graphical models of species populations to make predictions about the impacts of environmental change. Students can use existing computer simulations (i.e. PhET Simulations, ScratchEd) to explore and better understand scientific and engineering systems. This helps students test and analyze interactions between components in a system.

Integration of Science with Literacy

Reading, interpreting, and producing text[1] are fundamental practices for students making sense of phenomena. Elementary students can use picture books, videos, or drawings to obtain information and then communicate using drawings or through short discussions. In upper grades, students continue building this practice through reading and interpreting text (decoding technical terms, interpreting graphs or other figures), evaluating primary/secondary sources, and producing information for various audiences. Project EXCELL outlines strategies focused on academic language, literacy, and vocabulary; linking background knowledge and culture to learning; increasing comprehensible input and language output; and stimulating higher order thinking.

Engaging in Argument from Evidence

The convergence between the Science and Engineering Practices, the Standards for Math Practices, and the ELA Capacities highlights students constructing viable, valid arguments using evidence. One strategy to help students construct viable, valid arguments using evidence is through the Claims, Evidence, and Reasoning (CER) model; students use their prior knowledge to evaluate relevance and reliability of evidence and then uses scientific reasoning to explain how that evidence logically supports a claim. Using student and teacher talk moves alongside sentence frames allows students to construct arguments, use evidence to critique the reasoning of others, and build productive classroom culture.

[1] Text includes videos, graphs, diagrams, pictures, written word, charts, equations, computer simulations.

Reach out to the Math and Science Bureau staff with questions or for more information.