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Fact Sheet

STEM Classroom Computer Modeling

www.STEMccm.com

Brief Description:

STEMccm is a website created in cooperation with many partner organizations, professional development facilitators, interns, teachers, and students. The goal of STEMccm is to introduce teachers to, and develop, modeling content they can use in their classrooms with students. The primary focus is on computer modeling using NetLogo. The website introduces the pedagogy of modeling, provides a three week lesson sequence to use with students, and also includes over a hundred 5-E lessons which are linked to the CCSS-M Math and NGSS Science standards. Additional resources are included which can help teachers in teaching STEM – statistical tutorials and tools, STEM activities, additional modeling platforms, helpful resources, and links to upcoming workshops.

Resources for Educators:

The website is broken up into five areas, described below:

Modeling Pedagogy: This section covers the *why* and *how* of modeling in the classroom. Specifically, it explains that modeling is one of the most powerful tools in developing depth of knowledge and problem solving. The “how” is divided up into 3 stages: using models, modifying models, and creating models (UMC). The UMC sequence scaffolds the challenges of modeling to best bridge the gap between student coding ability and content knowledge.

NetLogo Instruction: This section provides an introduction to NetLogo following the UMC paradigm. Students can either jump into the 15 model sequence or teachers can deploy the NetLogo Units of Study which provide roughly 15 days of instruction in NetLogo, culminating in a standards driven project.

NetLogo Wiki: The Wiki provides a variety of resources to assist with coding in NetLogo, from a dictionary to short video tutorials. Many of these tutorials were created by students and teacher participants.

Content Instruction: This section provides well developed resources across a variety of academic content areas. In the NGSS and CCSSM-M lesson libraries can be found over a hundred fully developed 5-E lessons with supporting documentation linked. In the Statistical Tools section can be found video tutorials covering topics ranging from dot plots to statistical inference. STEM Activities, STEMccm Models Library, and Other Modeling Tools provide additional content teachers might consider using in their classrooms.

About STEMccm: This final section of the site explains the history of the STEMccm collaborative project, partnerships, past trainings, upcoming trainings, and a point of contact.

Professional Development:

Three trainings will be offered in summer 2017 through Lawrence Livermore National Laboratory. Computer Modeling and Simulation Teacher Research Academy (TRA)

Level 1 – July 10-14 – Introduction to coding, modeling, simulation, and the resources of LLNL.

Level 2 – July 17-21 – Additional training in coding with a focus on pedagogy, lesson planning, and curriculum.

Level 3 – July 24-28 – Teachers who have completed Levels 1 and 2 *in a previous year* return to the lab with some students. Instructors and teachers facilitate the course in which students work collaboratively to solve a real problem.

