SimScientists Crosscutting Concepts: Progressions In Earth Systems

The SimScientists program at WestEd is developing a multilevel assessment system for middle school Earth sciences. This project will create formative and summative assessments and companion classroom reflection activities for Geosphere, Climate, and Ecosystems.

Major project objectives are:
- Create and validate hypothesized learning trajectories for three crosscutting concepts of Scale, Systems and System Models, and Energy and Matter Flows
- Determine how learning of crosscutting concepts progresses across three topics,
- Establish the efficacy of the final modules with 44 teachers and 4000 students’

Validity of the assessments and progressions: How can tasks be designed to promote and assess progressively more integrated understanding of the crosscutting concepts, core ideas, and practices as they apply in multiple topics/units across an Earth sciences year-long curriculum?

Validity of the progressions: How can evidence from performance on these tasks be used to iteratively refine hypothesized learning trajectories within each topic and the learning progression across topics be mapped onto learning trajectories for crosscutting concepts?

Learning outcomes: How does student understanding of the three crosscutting concepts change over the duration of an Earth science strand of classroom instruction, as fostered by simulation-based curriculum-embedded assessments and follow-up reflection activities?

This material is based upon work supported by the National Science Foundation, award Grant DRL-1420386. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.