

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.

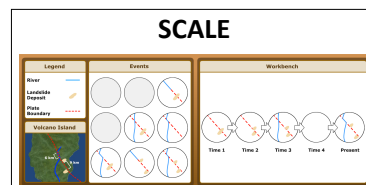
Major project objectives are:

- 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?

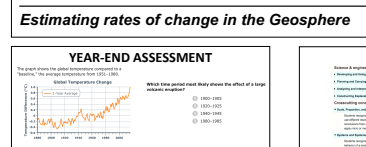
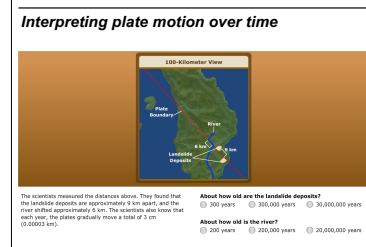
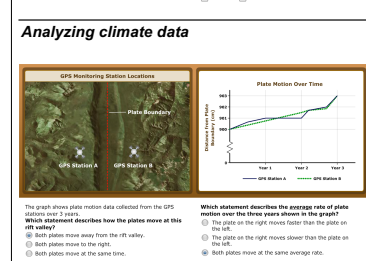
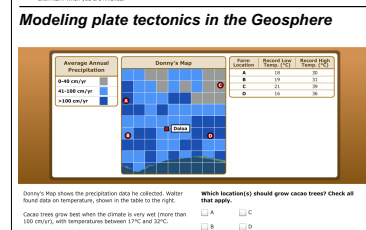
Learning outcomes: How does student understanding of the three crosscutting concepts change over the duration of an Earth science strand of classroom instruction, as fostered by simulation-based curriculum-embedded assessments and follow-up reflection activities?



Modeling plate tectonics in the Geosphere

Which location(s) should grow cause trees? Check all that apply.

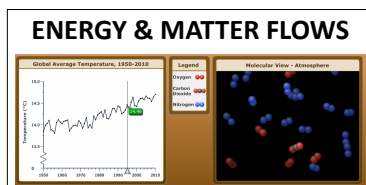
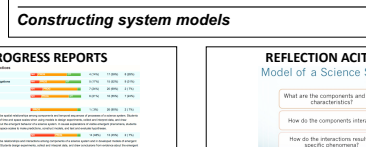
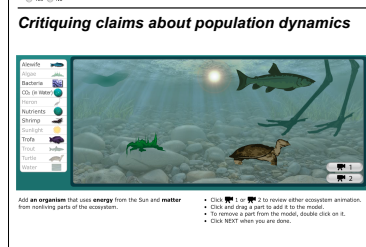
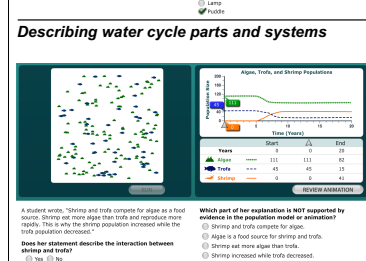
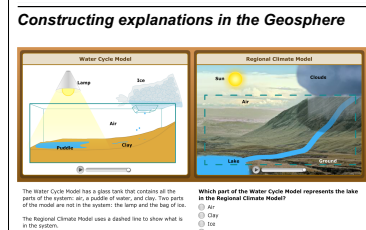
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Constructing explanations in the Geosphere

Which location(s) should grow cause trees? Check all that apply.

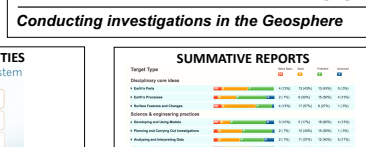
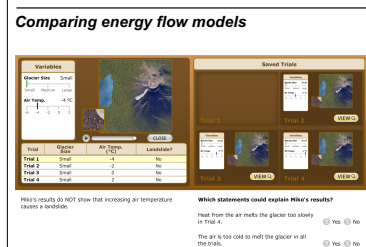
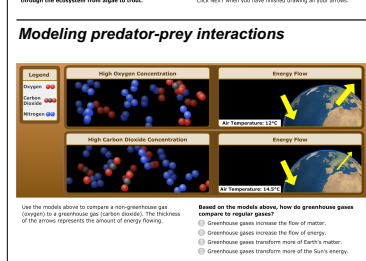
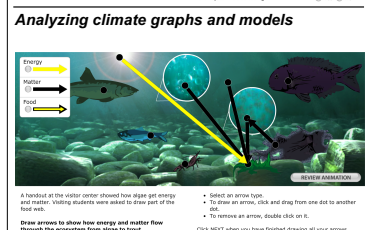
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Constructing explanations in the Geosphere

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RESEARCH DESIGN

PROGRESSIONS DEVELOPMENT 2014-15

- Design and development of progressions
- Expert review
- Cognitive labs and structured interviews
- Revisions

ASSESSMENT DEVELOPMENT 2014-17

- Prototype development
- Module design and development
- Alignment and quality review
- Classroom feasibility testing

PILOT TESTING 2017-18

- Two samples of 22 teachers each, with a total of 4000 students
- Sample 1: 3 Full simulation suites with embedded Reflection Activities, External Pre/Post measure
- Sample 2: External Pre/Post measure only

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