

"With the LOOPS model, I can better use student work to lead class discussions."

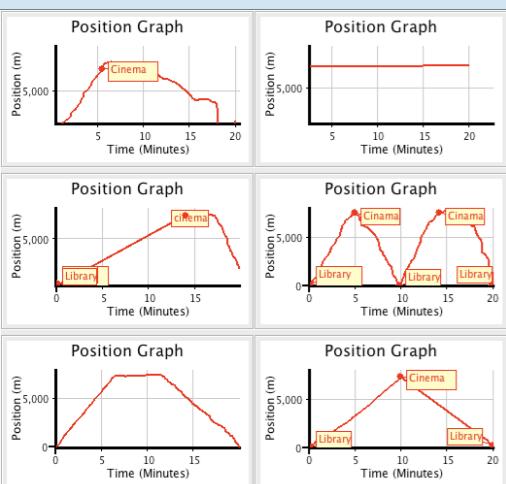
— CA teacher

"Viewing student work, particularly when there is a graph and an explanation, gives me insight into how they are thinking."

— CA teacher

Curriculum is being developed for middle school science: force & motion and chemistry.

Materials are being piloted in CA and MA classrooms.



Using LOOPS, students' prediction graphs may be selected by the teacher and presented for class discussion. Students then test their predictions using motion probes.



The Concord Consortium is a nonprofit educational research and development organization.

Logging Opportunities in Online Programs in Science



Can technology supply teachers and students with timely data that provides insights into student learning?

PI: Kimberle Koile
Concord Consortium (CC)

co-PIs:

Paul Horwitz, Bob Tinker, CC
Marcia Linn, U of CA Berkeley
Jim Slotta, U of Toronto

Inquiry activities can be logged.

Students interact with:

- Computational models
- Sensors
- Graphs
- Drawing tools

Teachers can use feedback to tailor instruction.

- During class
- Between class meetings
- Between uses of curriculum units

The screenshot shows a user interface for a science activity. On the left, there are four small 'Position Graph' windows showing various motion patterns. In the center, there's a section titled 'Describing a mystery substance' with a question about a 'mystery substance'. Below this is a 'Select a substance...' interface with a 'Take snapshot' button and a 'Lab book' icon. Two atomic snapshots are shown: one with blue spheres and one with purple spheres. Each snapshot has a text box below it where students can type their hypotheses. The blue snapshot's text box says: 'My partner and I believe that these molecules closely resemble the ones of the mystery substance. The slide by each other and do not vibrate which leads us to our hypothesis that the mystery substance is a liquid.' The purple snapshot's text box says: 'I think the substance in the mystery bag is a solid because the particles are close together like these particles which are the particles of a magic eight ball. They don't look like the particles in a liquid or a solid because they are only vibrating in place.' At the bottom, there are 'Choose an entry from your Lab book' and 'Submit' buttons.

Students explore the atomic view of substances, then submit to the teacher a snapshot of a substance matching the mystery substance.

The teacher picks several student answers to project in the classroom and on each student's machine.

Logged activities can provide feedback to teachers and students.

- Student progress: What activities has each student completed?
- Polls: Which student answers are most common?
- Pick-N: Which N student answers are good examples to share with the class?
- Inquiry index: Which student actions provide insight into learning?
What, for example, does systematic exploration of a model reveal?

loops.concord.org

Research questions

- What LOOPS data gives insight into student learning?
- What is the impact of LOOPS on instructional practice?
- What is the impact of LOOPS on student learning?

Technology

Based on SAIL

(Scalable Architecture for Interactive Learning)

- Developed in NSF-sponsored TELS project
- Delivers interactive learning materials and persistent learner data
- Activities available via loops.concord.org and wise4.telscenter.org



This project is supported by the National Science Foundation under Grant No. DRL-00733299.