Navigating to NGSS Success: Enhancing Visualizations

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Web-based Inquiry Science Environment (WISE) – wise.berkeley.edu

78,000 students & 8000 teachers (as of July 2014)
The Graph Animator: The BEAR Story

• Girls walk from lunch spot to bear
• Girls run back to lunch spot
• Girls wait
• Girls walk slowly back to bear
• Girls walk normally to meet up spot

Today Shanice and I saw a bear - it was so scary! At 3:00 pm, we had just left our lunch spot and were walking at our normal pace. After 20 minutes, we had gone about 400 meters when we saw this gigantic black fuzzy thing on the side of the trail ahead of us. I grabbed Shanice’s arm and mouthed the word “BEAR!” Fortunately, the bear was busy eating berries and didn’t notice us.

We didn’t waste any time getting out of there; in fact I’ve never run so fast in my life! We sprinted back to our lunch spot in only ten minutes and then stayed there wondering what to do for the next ten minutes.

At 3:40, we decided to take our chances and keep moving forward on the trail because we knew the rest of the group would start to worry about us. So we slowly crept towards where we saw the bear. This time it took us 40 minutes to cover that 400 meter stretch. When we got there, the bear was gone (phew!), so we resumed our normal pace and caught up with the group at 5:00, 1200 meters from the lunch spot.
The WISE Graph Animator

Using real-time models to develop ability to interpret position and time graphs.

Links to NGSS practices
- using models
- obtaining, evaluating information
- analyzing and interpreting data

The WISE Image Annotator

Students use an annotator to interpret data in the Mitosis Unit.

Links to NGSS practices
- Constructing explanations
- Obtaining, evaluating & communicating information

Students use the Idea Manager to develop an explanation while they are engaging in the other practices.

Links to NGSS practices
- Constructing explanations
- Obtaining, evaluating and communicating information

Scaffolding students’ use of visual evidence

7th grade students (n = 67) - Mitosis Unit

Mean numbers of ideas submitted to Baskets during Interpreting Data activities.

Pretest (M = 2.38, SD = 0.48, SE = 0.05), Posttest (M = 2.92, SD = 0.79, SE = 0.08); t(105) = -7.03, p < .000, Cohen's d = 0.72) - (Matuk & Linn, 2013)
NGSS Practices - Research Agenda?

• Modeling tools, visualization tools, and annotations and idea records are all combined in WISE to support large numbers of students engage in NGSS practices.

• How can we take advantage of these tools and others to establish a research agenda?
• What are new tools that need be created?
• How do these tools assess NGSS?
Thank you

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