From Graphs as Task to Graphs as Tool

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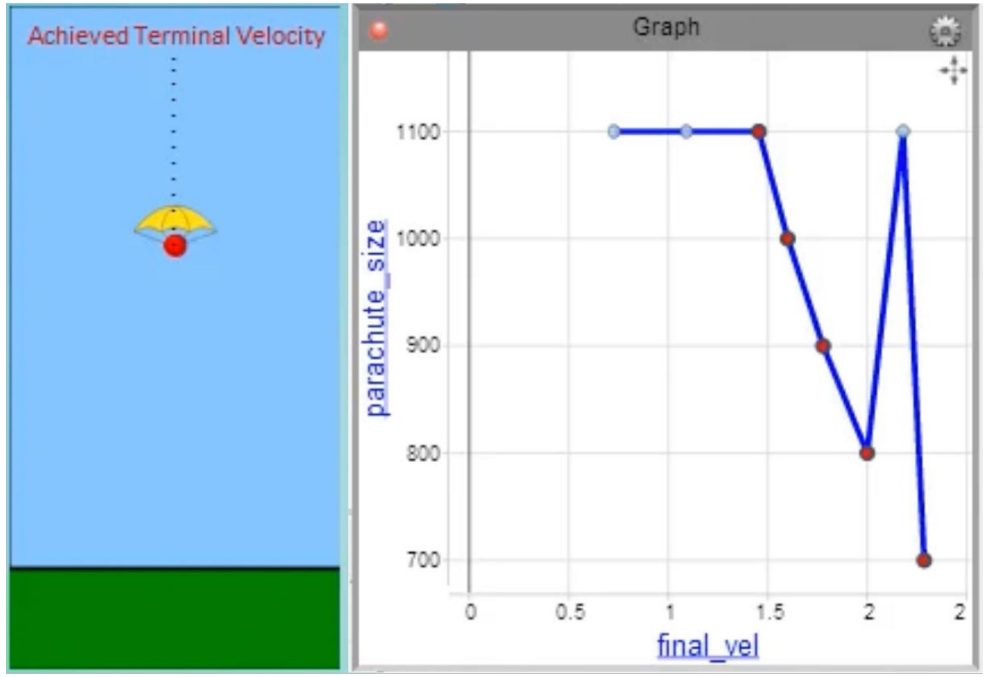
The InquirySpace project

InquirySpace developed an online data exploration environment and a sequence of increasingly independent science classroom explorations. Data the students produced were represented in multiple ways, including graphically.

"Doing school" or "doing science"?

Some students were observed handing in their graphs without attempting to understand them while others spent considerable time over their graphs. In general, prior research has indicated that few students view graphs as tools that can help them understand scientific phenomena.



When their graphical patterns did not appear to align with their data production, students became motivated to engage deeply with those graphs and change either their experimental procedures or their conceptions.

Qualitative analysis

Video recordings from three small groups who were designing and engaging in InquirySpace physics explorations were analyzed in depth. Video coding categorized how the students interacted with graphs of their own data.

Shifts in student interactions with graphs

Unexpected data patterns sometimes—but not always—preceded shifts into deeper engagement with graphs. When these shifts were observed, transcripts indicated that the students perceived patterns in the graphs to be misaligned with the actions they had taken to produce those data.

Fostering a need for alignments

Working with real-time data graphs appeared to foster students' perception of a need for alignments between their data production and their data representations. Attempting to produce such alignments led students to engage with graphs more as scientists do.

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