

AMTE 2015 Using DGS to Support Students' High Level Thinking
Milan Sherman, Charity Cayton, and Kayla Chandler

| | | Technology Used As | |
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| | | Amplifier Students could achieve the same goal without the technology | Reorganizer The mathematical goal of the task would be difficult or impossible to achieve without technology |
| Goals | Question | Use of Design Principles | |
| Make mathematically meaningful observations; look for invariant relationships. | Do the sketch and prompts use the dynamic affordances of DGS in a way that would be difficult or impossible to replicate without it? | Students create multiple static examples, either by construction or dragging, and reason from those static examples, e.g., students are prompted to make observations or generalizations based on a table or static measurements without reference to the sketch. | The sketch allows for continuous dragging, and students are guided to examine measurements or relationships dynamically. Students are required to make or explain observations or generalizations dynamically in terms of the sketch. |
| Mathematical exploration; use appropriate tools strategically. | How does technology support mathematical exploration? | Sketch and prompts guide students to investigate the same example or set of examples to explore mathematical connections or invariances. Freedom with respect to dragging does not make a task open-ended or provide alternative paths if students are all investigating the same example. | Sketch and prompts allow students to explore based on individual observation of mathematical concepts, connections, or invariances within the sketch. The sketch supports students' mathematical exploration by providing alternate paths. |
| Foster curiosity and modify thinking; make and test conjectures | Does the sketch provide feedback? Do the prompts encourage students to use feedback? | Experimentation is limited by restrictive construction or does not provide feedback to allow students to explore their own conjectures; or prompts do not explicitly guide students to test conjectures. | Sketch and prompts support experimentation; sketch provides feedback or allows students to test and refine conjectures. Prompts explicitly guide students to use the sketch to test conjectures. |

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