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| Phase 4: Route Planning and Roving Challenge | |
| Step 1 | Students read informational texts about past rover missions. |
| Step 2 | Students watched a NASA-produced video about Curiosity’s first year on Mars and the challenges it has faced (Curiosity is the Mars 2013 Rover). |
| Step 3 | Students read more informational text about, and viewed images of, NASA’s new ‘depot caching’ strategy which is very different than Curiosity’s mission. Depot caching involves collecting multiple samples that are placed in a container and deposited on the surface so that a future mission can be the first to return samples of Mars rocks to Earth. |
| Step 4 | Students generated multiple solutions on paper maps to planning a safe yet effective route across Mars’ surface and depositing their valuable rock payload on the surface. |
| Step 5 | Students compared their solutions to one another and discussed better strategies for gathering their scientific payload more efficiently and safely. |
| Step 6 | Students made multiple attempts (between 3 and 6 was typical); revising their solution each time in light of feedback from the mission itself (premature failure due to hazard point accumulation) as well as feedback from their peers. Students kept their maps so that some of them could be used to set up the robot roving of Mars. |
| Step 7 | Students learned to use block programming with the Dash Robot platform. |
| Step 8 | Students used their robots to navigate on a simulated Martian terrain that mimicked some of the different route plans they developed. |