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| Phase 2: Select a Crew and Pack for Mars Challenge |
| Step 1 | Students read an informational text about the food and equipment NASA astronauts need in space. |
| Step 2 | Students read additional information about the five types of mission specialists they could select for their crew.  |
| Step 3 | Students rank ordered five choices (see supplemental materials for “Crew Selection and Packing Challenge”) for what they thought would be the most important aspect of the mission to plan for. |
| Step 4 | Students selected three mission specialists from the five available types to form their Mission to Mars crew. |
| Step 5 | Students engaged in the physical portion of the packing activity where they combined their mission planning goals and specialist selections with their spatial reasoning abilities to physically pack for the voyage. This involved using Melissa and Doug wooden blocks and a 740 mL lidded plastic container. Each shape of block was assigned an identity (oxygen, food, rover, etc.). Some blocks were designated as “emergency or repair kits” that only certain mission specialists could use (for example a medical kit). Students had to be careful to pack everything needed for the humans to survive as well as the proper kits to meet emergencies.  |
| Step 6 | Students undertook their journey to Mars, encountering difficulties along the way. On each journey students could only take three mission specialists. Students rolled a die a certain number of times (we felt 5 was a good number) and marked down the number of challenges they successfully met versus failures. A mission was a success if they had more successes than failures. Students could re-do the journey by selecting a new crew and trying again.  |
| Step 7 | The teacher held a class discussion where students reflected on what it would be like to actually experience those emergencies and what the outcomes would be. |
| Step 8 | Students learned about NASA’s landing ellipses for Mars. |
| Step 9 | Students built paper rockets, launched them with a stomp rocket launcher made of PVC, duct tape, and a water bottle, and attempted to land them in the simulated landing ellipse. Students redesigned rockets as needed. |