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NDSGC K-12 Teacher Workshop Activities

Parachute Parade (45 minutes):
Students learn about NASA's Orion mission and the capsule's safe return to Earth. They design their own parachutes (tissue paper and dixie cups) with different weights and parachute sizes to test and re-test the system (dropped from a ladder or other high level).

Protect Your Astronaut (30 minutes):
Students test out different space suit materials on astronauts they build out of pipe cleaners and UV-radiation sensing beads, which work just like the sensors built into astronauts' space suits.

Stomp Rockets (45 minutes):
Students work in teams to design a payload container to keep food safe in a journey onboard a rocket to reach Mark Watney on Mars and save him before his potatoes run out. Raspberries represent the payloads, and students use air powered rockets that they build to safely deliver the rations to Astronaut Watney.

Deep Sea Diver (45 minutes):
Students work in teams to design a neutrally buoyant tool that astronauts can use in the Neutral Buoyancy Lab (giant swimming pool) at NASA's Johnson Space Center. They are given a bag of materials and have to design an object that neither floats nor sinks.

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Strange New Planet (1 hour):
Students work in teams while exploring a newly discovered planet as different roles: astronomer, satellite, flyby spacecraft, and orbiter. They experience the process NASA goes through in mission design (like the Kepler Mission) while actually observing and recording data about an (arts and crafts-made) planet.

Super Sleuths (45 minutes):
Students work in teams to match meteorite samples (glitter) to a parent body asteroid. Teams come up with their own analysis criteria and testing procedures to correctly identify the meteorite samples.

Robotic Arms (45 minutes):
Students have the choice to build end effector robotic arms that use the same technology as the CanadArm on the International Space Station, or robotic hands that increase their reach by remote operation (strings). Students compete the see which robotic hand is more efficient at soil sample collection or payload retrieval.

Moons of Jupiter (90 minutes):
Students work in teams to complete astronomy observations that mirror the work of Galileo over 400 years ago. They plot moon positions over the course of 2 weeks of real observations (simulated in the classroom), complete calculations which introduce Newton's Laws, graph, and model their data in three dimensions.

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Sorting the Solar System (1 hour):
Students travel back in time and work in teams to determine classification of objects in the night sky. As technology improves, more information and objects are introduced into the existing catalog, and students must work together to determine the criteria used in defining different groups of celestial objects. This experience allows for increased understanding of the reclassification of Pluto as a dwarf planet.

Apollo 13 Mission (45 minutes):
Students work in teams of astronauts and engineers to work on communication skills. Separated by millions of miles of space (trifold display), the engineers must design an object that can safely scrub carbon dioxide out of the atmosphere to save the astronauts. Astronauts must accurately build the engineers' design to survive. (This activity may also be done with 3D wooden pattern blocks.)

Pocket Solar System
(15 minutes):
Students are each given a 5 foot piece of cash register paper and asked to estimate distances between planets and the asteroid belt with the Sun and Pluto on each end. Students then flip over their estimates to plot out scale distances using a nifty trick from NASA.

Mars Rover Lander (45 minutes)
Students learn about the Mars rovers and how they each successfully landed on Mars. They work in teams to design a lander platform to protect an egg (the rover) from the Martian surface upon release, working through the engineering design process.

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