

Below are the primary interactive activities called Lab Packs available for use in Space Voyage School Seminars. Typically, 16 lab packs are used for a school seminar, often with multiple set-ups of many of the lab packs used. We have provided a short description, theme and Colorado Science Standards covered by each activity. See also the Lab Pack Matrix.

1. SHUTTLE PILOT: Space Shuttle computer simulation.  
An activity at the Shuttle Flight Simulator that challenges students to successfully land a space shuttle. Students also experience visuals on the flight deck of the space shuttle.  
Theme: Hand-eye coordination.  
Colorado Science Standard: 4.4, 5, 6
2. ROBOTICS: Controlling a five-axis robot arm.  
Students work with five-axis robot arms to collect and move materials as quick as possible. Typically three robot arms are set up.  
Theme: Problem solving, materials handling, hand-eye coordination.  
Colorado Science Standard: 4.4, 5
3. VORTEX: Working with energy and gravity.  
Students put energy into a vortex well and try to maximize roll time for a steel ball.  
Theme: Problem solving.  
Colorado Science Standard: 2.2, 6
4. FOOD IN SPACE: An ice cream taste treat.  
All students are invited to compare freeze-dried ice cream with regular frozen ice cream and then taste the freeze-dried ice cream.  
Theme: Awareness of changes needed to live in space. Team spirit.  
Colorado Science Standard: 3.3, 6
5. 3-2-1 POP: Building an Alka Seltzer rocket.  
Students construct Alka Seltzer and water “rockets” out of paper and film canisters.  
Theme: Materials handling, teamwork.  
Colorado Science Standard: 1, 2.2, 2.3, 4.4
6. TEAM TOWER: Understanding teamwork.  
Students work as a team to build a tower of wood blocks within a certain time. The concepts of gravity balance and teamwork are key in this energy filled activity.  
Theme: Teamwork, problem solving, communication.  
Colorado Science Standard: na
7. SPACE GOLF: Understanding kinetic energy and momentum.  
Students use ramps of varying height and balls of different materials to roll balls to make a “hole in one”.  
Theme: Problem solving.  
Colorado Science Standard: 2.2, 6
8. YAW-AXIS TRAINER: How astronauts train.  
Students operate this motion trainer to learn how astronauts train and how motion affects human balance. Students learn about the pitch, roll and yaw

axes.

Theme: Teamwork, communication.

Colorado Science Standard: 4.4, 5, 6

9. **SPACE INFLATABLES:** Experience the size of the space shuttle orbiter. This inflatable half-size shuttle crew compartment gives the students the chance to experience the size of the shuttle from both inside and outside of the inflatable.  
Students learn the actual dimensions of an American shuttle-orbiter.  
Theme: Problem solving, career awareness.  
Colorado Science Standard: 4.4, 6
10. **SPACE MARBLES:** See how magnetism affects the motion of marbles. Student are challenged to shoot marbles to see how magnetism affects motion and how objects aggregate.  
Theme: Problem solving, hand-eye coordination.  
Colorado Science Standard: 2.1, 6
11. **MATERIALS HANDLING:** Nuts and bolts. Students observe material density versus. Students study problems with the loss of finger dexterity when wearing gloves.  
Theme: Problem solving, materials handling.  
Colorado Science Standard: 2.1
12. **SPACE BRIDGE:** Team engineering. Students work individually or as a team to build a bridge to span distances between two supports. The bridge must span a given distance using the least possible resources.  
Theme: Problem solving.  
Colorado Science Standard: na
13. **SPACE RELAY:** Relaying objects with robot arms. Students work as a team to relay a set number of objects using “robot arms” from one location to another in the shortest amount of time.  
Theme: Teamwork, materials handling.  
Colorado Science Standard: na
14. **GRAVITY MACHINE:** Build a gravity ramp. Students study gravity, momentum, and conservation of energy to minimize the effect of gravity.  
Theme: Teamwork and problem solving.  
Colorado Science Standard: 1, 4.4
15. **GEO SAFARI:** Self directed exploration. Students work in small groups or individually to complete instructional activities. Activities in include analytical skills, geography, and space related thinking.  
Theme: Problem solving, teamwork.  
Colorado Science Standard: 4.4
16. **ETCH-A-SKETCH:** Hand-eye coordination. Students are challenged to measure and improve hand-eye coordination by

working through a series of mazes and overlays. Ultimately, the student should be able to write his/her name in cursive on the Etch-a-Sketch.

Theme: Problem solving, hand-eye coordination, training to fly a space pod.

Colorado Science Standard: 5

17. PIPE WORKS: Team engineering.

Students are challenged to arrange in three dimensions a set of half-pipes that rolls a steel ball to specific target.

Theme: Teamwork, problem solving.

Colorado Science Standard: 1, 2.2, 6

18. JAMISON ROCKETS: Understanding rocket flight.

Students learn about rocket flight paths, thrust and construction by launching foam rockets into a target box.

Theme: Problem solving, teamwork.

Colorado Science Standard: 1, 2.2, 4.4

19. SPACE NIGHTMARE: The effects of distraction on performance.

Students are challenged to control a spaceship while being distracted. Computer based program requires progressively more focus and concentration. Students learn to focus and pay attention as well as the importance of over-learning.

Theme: Problem solving, teamwork.

Colorado Science Standard: 1

20. SLINKY STAIRMASTER: Energy and movement.

Students work as a team to build a slinky staircase that will allow their slinky to successfully “walk down” all steps. Students learn about potential and kinetic energy, cause and effect, momentum, balance, teamwork, problem solving and communication skills.

Theme: Problem solving, teamwork and communications.

Colorado Science Standard: 2.2, 2.3, 6

21. BALLOON ROCKETS: Building an air-powered rocket.

Students construct balloon rockets out of balloons, straws and tape that are launched vertically on a taut string. Students learn about thrust and lift as they experiment with lifting various payloads with their rocket.

Theme: Problem Solving, material science.

Colorado Science Standard: 1, 2.2, 4.4

22. GYROSCOPE LAB: Managing an energy system.

Students explore and study an energy system in this gyroscope lab. Students learn about conservation of energy, balance, friction, gyroscopic stability and hand-eye coordination.

Theme: Problem Solving.

Colorado Science Standard: 2.2, 2.3, 6

23. COMM CHECK: CB Radio / Two way radio communications.

Students communicate between mission control and the space station to build a model of the space station. The only method of communication is a radio provided. Students in the space station are challenged to build an identical model of the space station as described by mission control.

Theme: Communication, problem solving, teamwork.

Colorado Science Standard: 4.4

24. **CENTRIFUGE WHEEL:** Working with energy, momentum and balance.  
Students work as a “human gyroscope” as they experience gyroscopic balance and stability.  
Theme: Problem solving, teamwork.  
Colorado Science Standard: 2.2, 2.3, 6
25. **LUNAR ROVER:** Driving a radio control car through a maze.  
Students direct a lunar rover through a series of mazes and cones. Lunar Rover is a timed event.  
Students begin to appreciate the difficulty in precise hand-eye coordination.  
Theme: Problem solving.  
Colorado Science Standard: 4.4
26. **WORKING IN SPACE:** Career Center.  
Students learn about science and technology careers.  
Theme: Career awareness.  
Colorado Science Standard: 5
27. **EARTH AND MOON SYSTEM:** Size, Weight and Distance.  
Students compare and contrast the relative sizes, masses, and distances between the Earth and Moon using scale models.  
Theme: Problem solving, teamwork.  
Colorado Science Standard: 2.1, 4.4, 6
28. **PLANETARY WEIGHTS:** Comparing mass of the planets in our solar system.  
Students lift and compare identical containers to see how weight varies on different planets.  
Theme: Problem solving.  
Colorado Science Standard: 2.1, 4.4, 6
29. **SATELLITES & SPACE EXPLORATION:** Earth and Planetary Spacecraft.  
Students learn about satellites, their parts and functions, examples of how satellites help us in our everyday life and how spacecraft are used to study the solar system.  
Theme: Problem solving.  
Colorado Science Standard: 4.4
30. **MOON BOUND:** Understanding the properties of our Moon.  
Students learn about different aspects of the moon including phases, the NASA Apollo missions, discoveries and NASA plans to return to the moon.  
Theme: Problem solving, teamwork.  
Colorado Science Standard: 4.4, 6
31. **LIFE SUPPORT AND THINKING LIKE AN ASTRONAUT:** Anticipation and reliability.  
Using an inflatable orbiter, students participate in shuttle deflation and learn about astronaut training and spacecraft life support systems.  
Theme: Communication, problem solving, teamwork, career awareness.  
Colorado Science Standard: 2.1, 4.4, 5, 6
32. **MAGNETISM LAB:** Experiments in Magnetism.  
Students will experiment with a variety of magnets and materials to learn about magnetic forces and how various materials are affected by magnets.  
Theme: Problem solving  
Colorado Science Standard: 1, 2.1