

Endeavour Space Education Programs (ESEP)

A. Airplanes and Flight

Learn the basics of aerodynamics and airplane components. Capture the endeavour spirit to fly. Balsa-wood model airplanes that students have constructed in class prior to field trip are competitively flown by correctly adjusting aileron, rudder and elevators tabs after the lesson. Launch water pressure rockets if time permits. Recommended Items to Order: 1 Airplane Kit per student (see following page).

B. Astronomy and Waves.

Understand the basics of the visible light spectrum, frequency and Doppler shift effect with "hands-on" demonstrations. Astronomy terms such as supernova explosions, black-holes, comets, asteroids, clusters, and quasars are discussed. View the beginning of the universe and our solar system with a video narrated by William Shatner. Construct and experiment with a spectroscope kit which accurately measures the frequency of light. Recommended Items to Order: 1 Spectroscope Kit per student (see following page).

C. Human Space Exploration

Space environmental concepts such as a vacuum, extreme temperatures and why astronauts float are explained. Astronaut suit design is explained and demonstrated. Living and eating aboard the Space Shuttle are shown on video. Space Station construction and assembly are shown. Current Mars missions and future ones are explored. A Space Shuttle glider is constructed at the Endeavour Center and a Shuttle tile is burned. The concepts of heat transfer and insulation are explained. Recommended Items to Order: 1 Space Shuttle Glider per student, Astronaut ice cream (see following page).

D. Rocket Propulsion

Introduction to the basics of solid and liquid type rocket motors. Current space vehicles are discussed with models which include OSC's Pegasus rocket, Titan IV, Space Shuttle and the Saturn V. A video of rocket launches from Vandenberg AFB and Pegasus vehicle stage separations from an on-board camera looking back towards Earth is shown as it deploys a satellite. Model rockets that students have constructed in class prior to field trip are discussed and launched after the lesson. Recommended Items to Order: 1 Rocket Kit per student - must be built prior to program (see following page).

E. Telescopes and Constellations

Discuss the different types of telescopes and how they work. Discover how to view the night sky and constellations. Construct and learn how to use a star chart. Build and use a refractor telescope kit at the Endeavour Center if purchased. Take a tour of the Endeavour Center's \$60,000 solar-powered research telescope and dome. Recommended Items to Order: 1 Refractor Telescope Kit per student, 1 Star Chart per student (see following page).

F. Intergalactic Geology

Learn all about plate tectonics, volcanism, landforms, and rocks on Earth and beyond. Learn to identify the three different types of rocks using the rock cycle and various physical property tests. Field Trip to local fossil dig site may be requested. Recommended Items to Order: Rental of 15-Passenger Van / Bus depending on group size (see following page).

ENDEAVOUR SPACE EDUCATION PROGRAM (ESEP) RECEIPT

ORIGINAL TO CUSTOMER AND COPY TO SIL FILE
CHECKS PAYABLE TO: SIL, INC. FOR ENDEAVOUR CENTER SCHOOL FIELD TRIP

SCHOOL ORGANIZER: _____ PHONE: () - _____ FAX: () - _____

E-mail: _____

PROGRAM: _____

GROUP/SCHOOL: _____ ADDRESS: _____

GROUP VISIT DATE(S) (00/00/00): ____ / ____ / _____, CA 9

GROUP VISIT TIME(S) (00:00a/pm to 00:00a/pm): _____ - _____

PROGRAM AT THE ENDEAVOUR CENTER

ITEM	UNIT COST	QUANTITY	COST
COST PERYOUTH: 3-4 hours (NO CHARGE FOR ADULTS)	\$8.00		\$.
COST PER YOUTH: 1-2 hours (AFTERNOON ACTIVITIES ONLY)	\$6.00		\$.
Rental of 15-Passenger Van (1/2 DAY TRIP)	\$100.00		\$.
Rental of 15-Passenger Van (FULL DAY TRIP)	\$150.00		\$.
Rental of 15-Passenger Van (1 WEEK TRIP)	\$500.00		\$.
Rental of 28-Passenger Bus (includes driver) (1/2 DAY TRIP)	\$125.00		\$.
Rental of 28-Passenger Bus (includes driver) (FULL DAY TRIP)	\$200.00		\$.
MILEAGE (Van or Bus Rental)	\$0.40/Mi.	. Mi.	\$.

PROGRAM AT SCHOOL/GROUP SITE

ITEM	UNIT COST	QUANTITY	COST
OUTSIDE-CENTER PROGRAM	\$75.00/Hr./Staff	. Hrs.	\$.
MILEAGE (to and from School/Group Site)	\$0.40/Mi.	. Mi.	\$.

SCIENCE KITS

ITEM	UNIT COST	QUANTITY	COST
AIRPLANE KIT	\$5.00 Ea.		\$.
STAR CHART	\$2.00 Ea.		\$.
SPACE SHUTTLE GLIDER	\$2.00 Ea.		\$.
SPECTRASCOPE KITS	\$100.00/box (10 Spectrascopes)	Boxes	\$.
REFRACTOR TELESCOPE KITS	\$75.00/box (10 Telescopes)	Boxes	\$.
ROCKET KITS	\$75.00/box (12 Rockets & Motors)	Boxes	\$.
SPACE ICE CREAM & BOOK	\$5.00 Ea.		\$.
SPACE ICE CREAM	\$3.00 Ea.		\$.
TOTAL =			\$.

List of Attendees that Require Access to The Endeavour Center

SCHOOL/GROUP: _____ **PROGRAM DATE:** _____

Students (alphabetical by last name)

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Adults (alphabetical by last name)

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* Teacher, Chaperone, Busdriver