

PROGRAM:

LIGO Hanford Observatory Fieldtrip

OBJECTIVES:

Provide Walla Walla middle school students hands-on experiences with science and math and expose them to the technology available at near-by LIGO Hanford Observatory.

LOCATION:

LIGO Hanford Observatory, Hanford Reservation north of Richland, Washington

DESCRIPTION:

The LIGO Hanford Observatory hosts field trips for school groups of all ages. Trips provide an opportunity for students to learn about LIGO's search for gravitational waves, to meet and interact with a LIGO scientist or engineer, and to personally explore light, gravity, waves and the galaxy through hands-on exhibits and activities.

School representatives determine:

1. Which classroom curriculum parallels with astrophysics concepts introduced at LIGO.
2. Best month for classroom to tour LIGO.
3. Which programs will cover the cost for transportation, adult supervision and food.
4. Staff assigned to communicate with LIGO to schedule tour and curriculum highlights.

The LIGO HANFORD OBSERVATORY is located on the Hanford Reservation, approximately 5 miles north of Richland, Washington. The LIGO acronym stands for Laser Interferometer Gravitational-Wave Observatory, whose mission is to observe gravitational waves of cosmic origin. LIGO searches for gravitational waves created in the supernova collapse of stellar cores to form neutron stars or black holes, the collisions and coalescences of neutron stars or black holes, the wobbly rotation of neutron stars with deformed crusts and the remnants of gravitational radiation created by the birth of the universe. The California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT) operate LIGO for the National Science Foundation (NSF).



Twelve middle school students participated in the day's tour, along with two College Place teachers and the GEAR UP Site Director

IMPLEMENTATION TIMELINE:

PREPARATION ACTIVITIES:

Evaluate curriculum at the beginning of the year to determine the best time to include this field experience as part of the educational program.

Field Trip planning resources on LIGO website include:

- Descriptions of hands-on activities and exhibits.
- The "LIGO Explorer" - the exhibit guide given to students for the hands-on portion of a field trip. The LIGO Explorer is customizable and a teacher's guide is available.
- Washington Science GLE's on a visit to LIGO.
- A parent permission form that a school can use for a LIGO field trip.
- Look on our highlights page to view some visits to LIGO.

FOLLOW-UP ACTIVITIES:

After the field trip, students were asked to format a photo journal summarizing key concepts and target vocabulary.

COSTS OR COST CONSIDERATIONS:

- Adult supervision during the field trip
- Snacks/lunch
- Transportation
- Supplies for any preparation or post-field trip projects

CONTACT INFORMATION:

Dale Ingram, Education Outreach Coordinator
 LIGO Hanford Observatory
 P.O. Box 159
 Richland, Washington 99352-0159
 Phone: (509) 372-8248
 Fax: (509) 372-8137
 ingram_d@ligo-wa.caltech.edu
<http://www.ligo-wa.caltech.edu/teachers.html>

RESOURCES/ATTACHMENTS:

LIGO provides numerous resources on their website. Additional resources are also available when working with LIGO's Education Outreach Coordinator.

LIGO Fieldtrip Itinerary:
8:30 –Load bus and depart for Hanford Reservation
10:00 –Arrive at LIGO's Information Center
10:00- 10:20 – Snack and Information Center exploration
10:20 – 11:00 – LIGO presentation in the auditorium, plus light experiment exploration
11:00 – 11:10 – Walk to LIGO Observation Center; observe a sample laser tube
11:10 – 11:20 – Physics exploration in Observation Center's reception room
11:20 – 11:40 – Walk outside and look at 2 ½ mile tubes; question & answer session
11:40 – Noon – walk to and tour Observation Center
Noon – 12:30 –Lunch at Information Center
12:30 – Load bus and depart
2:00 p.m. – Return to school