



## STEM Field Trip Program

### Destination: The Tech Museum of Innovation



Congratulations on receiving a **SVEF STEM Field Trip grant, sponsored by Target**. This grant provides you and your classroom with an enhanced experience at the Tech Museum of Innovation (a \$400 value), admission of up to 25 students, and a transportation voucher of \$400. This document provides you with all of the information you need to make your field trip a success. If you have any questions about your SVEF STEM Field Trip grant, please contact [fieldtrips@sveffoundation.org](mailto:fieldtrips@sveffoundation.org).

#### Key Contact at Destination:

Carlos Camargo

[ccamargo@thetech.org](mailto:ccamargo@thetech.org)

#### Reservations:

Group Reservations

(408) 294-8324

[groupreservations@thetech.org](mailto:groupreservations@thetech.org)

#### Pre-Visit Lesson Plan:

For your pre-visit activity, go to page 2, "Building for the Big One."

#### Introduction at Destination:

Meet and greet with education staff and orientation tour of the Tech Museum (students and chaperones)

#### Visit at Destination:

This visit includes a behind the scenes tour highlighting Science Labs (Teacher and Education Coordinator), visiting galleries using Self-Guided materials for 6th grade around Earth Science, participating in hands-on science workshops on gallery floor tied to content-focus desired by instructor (students and chaperones), and seeing the IMAX film: *National Geographic Forces of Nature*. See page 4 for a description of gallery exhibits.

#### Post-Visit Wrap Up:

Students will leave inspired to do Post-Visit activities around Earthquakes, Create an edible Model of the Earth, and participate in a Citizen Scientist project like "Did you Feel it?" a seismology project sponsored by the United States Geological Society (USGS).

These post-visit materials will be distributed by the Education Coordinator at the Tech Museum at the wrap up of your field trip.

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**Pre-Visit Activity**  
**Building for the Big One**  
**Lesson Plan**

**Lessonopoly:** This lesson plan can be found on our Lessonopoly website at [www.lessonopoly.org](http://www.lessonopoly.org)

**Building for the Big One – LESSON PLAN SUMMARY**

How do architects and structural engineers design buildings to stand up to the power of earthquakes? Your students will find out as they build and test structures while learning about the earthquakes that shake them!

Grade Levels: 4-8

**Educational Outcome(s):**

Students will gain a hands-on understanding of the affects of an earthquake by building and testing their own structures in the exploration gallery/  
Students will understand the difference in how various soil types react to an earthquake.  
Students will see the types of instruments used to detect earthquakes.  
Students will see Force of Nature at work in the IMAX experience, Forces of Nature.

**California Science Content Standards Connections:**

- Grade 6 - Earth Science: 1c, 1d, 1e, 1f, 2d
- Grade 8 - Physical Science: 2a, 2b
- All grades - Investigation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations.

**California Math Content Standards Connections:**

- Grade 4 – Measurement and Geometry: 3.7
- Grade 7 – Measurement and Geometry: 3.6

**Pre-Visit Vocabulary**

These are words and concepts that we will discuss in the lab. Your students' lab experience will be enhanced if they are familiar with these terms prior to your visit.

- Core: the central portion of the earth, having a radius of about 2100 mi. (3379 km) and believed to be composed mainly of iron and nickel in a molten state
- Creep: Slow fault slip, occurring along a fault, without producing earthquakes.
- Crust: the outer layer of the earth, about 22 mi. (35 km) deep under the continents and 6 mi. (10 km) deep under the oceans
- Earthquake: A sudden movement of the earth's crust caused by the release of stress accumulated along geologic faults or by volcanic activity

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- Epicenter: The point on the Earth's surface directly above the focus of an earthquake.
- Fault: A fracture or zone of fractures in rock along which the two sides have been displaced relative to each other parallel to the fracture.
- Focus (hypocenter): The place at which an earthquake begins or ruptures.
- Force: Any influence that tends to accelerate an object; a push or a pull; force = mass x acceleration ( $F = ma$ : Newton's 2nd law).
- Mantle: the portion of the earth, about 1800 mi. (2900 km) thick, between the crust and the core
- Plate tectonics: A geological model in which the Earth's crust and uppermost mantle (lithosphere) are divided into a number of segments (plates).
- Tsunami: A long ocean wave usually caused by movements of the ocean floor during an earthquake.



**During Your Visit**  
**Tech Museum Gallery Connections**  
**Lesson Plan**

**Tech Museum Gallery Connections:**

- Exploration Gallery: Living on a Restless Planet
  - Experience an Earthquake
    - Students experience a simulation of real historical earthquakes, and test measuring tools of seismic activity.
  - Quake Watch
    - Students view recent seismic activity in the Bay Area
  - Seismometers
    - Students can make their own earthquake by tip-toeing, stepping, and stomping near a seismometer, and can gauge how strong an earthquake they create
  - Sensing Earthquakes
    - Students can push against stone blocks. Seismometers detect movement. Can students feel any movement?

