



**NATURAL HISTORY  
MUSEUM OF UTAH**

Rio Tinto Center | The University of Utah

# Time Machine

Field Trip	<b>Enduring understanding:</b>	<b>Alignment to Utah Core Curriculum</b>  <b>Intended Learning Outcomes (ILO's):</b> 1. Use science process and thinking skills. 2. Manifest scientific attitudes and interests. 3. Understand science concepts and principles. 4. Communicate effectively using science language and reasoning.
Grade Level: 4	In science, all inferences are based on facts. Facts are observable, measurable and quantifiable.	
Process Skills: <ul style="list-style-type: none"><li>• observing</li><li>• inferring</li><li>• reporting</li></ul>	Inferences are peoples best guesses based on the facts, they are influenced by life experiences and background knowledge.	

## Field Trip in a Flash

Students will observe and gather data from multiple exhibits to help them infer what Utah was like at a specific time in the past.

## Before the Museum

### Do a Science Process Lesson

Do the “Fact and Inference” lesson found at the Natural History Museum of Utah’s website. Other lessons that would support this field trip are: “Igniting Inquiry”, “Recording Stars” and “You are a Scientist”. They can be found at [www.nhmu.utah.edu/lessonplans](http://www.nhmu.utah.edu/lessonplans)

### Introduce the Field Trip Plan

**Explain** that you will be going to the Museum and that the students will be given a date in time to investigate. Their job will be to gather as many facts as they can to help them make inferences about what Utah was like at that time. Explain that in order to do that, they will need to observe objects closely and read panels and rails about the objects.

Have students select their groups they would like to work with or assign students to a group. Once the groupings have been created, assign a date/s to the groups of students. Remember,

there is a Futures gallery, so students could actually have the job of exploring possibilities of what is in store for us in the future.

If you choose to have your whole class work on recreating the same period in time, you can assign topics to each of the groups- plants, water, animals, people (if present), etc. Or you can have each group collect as much data as they can about that time period- this is a great way to demonstrate how, even with similar data, people's inferences can be very different.

Or, you can have groups work on different time periods to create a timeline which showcases environmental and biotic change that has happened in our location over a span of time.

### **Select an Exhibit or Exhibits**

When selecting exhibits, review the names of the exhibits and their content, this includes the periods of time that they span. The permanent exhibits are:

**First Peoples-** The story of Great Basin's prehistoric peoples is told while putting visitors in the shoes of archaeologists who use science to interpret the past. Explore Median Village, a reconstruction of an actual archaeological dig site excavated in the 1960s in Sevier County, Utah. Stop in the Dry Caves Learning Lab to learn more about what makes Utah so spectacular for preserving archaeological evidence.

**Gems and Minerals-** Rough mineral forms are juxtaposed with elegant cut gemstones, all in brilliant colors. Peer in to see minerals that fluoresce and take in 12 vertical feet of minerals suspended before you.

**Lake-** The compelling narrative of the Great Salt Lake, a remnant of ancient Lake Bonneville is brought to life through hands-on interactives, sounds, smells, and a spectacular view of the Lake itself. Take a "walk around" this large terminal body of water in the midst of a vast inland desert. Get an up-close view of some of the lake's smaller inhabitants.

**Land-** A journey through three distinct physiographic regions formed over millions of years, the Land showcases Utah's Middle Rocky Mountains, Basin and Range, and Colorado Plateau. While navigating the switchbacks, touch real rock specimens and explore interactive exhibits on earthquakes, plate tectonics, erosion and much more. Be sure to venture out onto the outdoor terrace for an up-close look at the foothills of Utah's Middle Rocky Mountain region.

**Life-** The web of life is illustrated in a series of exhibits exploring complexity from DNA to Ecosystems, with a focus on Utah's extraordinary biological diversity. This exhibition is rich with images, sounds of the landscape, hands-on experiences, live animals, and research stories.

**Native Voices-** The traditions of Utah's five native nations—Shoshone, Goshute, Paiute, Ute, and Navajo—are featured in this circular gallery nestled in the hillside at the top of the building. Designed in consultation with Utah's Indian community, this exhibition depicts Native American art and culture and interprets the deep memory and contemporary presence of Utah's indigenous people. Visit the Storytelling circle where you can listen to stories of origin and connection to the land.

**Past Worlds-** A sequence of snapshots in time spanning 500 million years depicts a range of Utah's ancient environments and their changing life forms. Utah's Late Cretaceous and Eocene are brought to life in displays that capture plant and animal diversity, sights, sounds and smells of the time. Participate in the Cleveland-Lloyd Dinosaur Quarry mystery by "casting your vote" on the theory you agree with most, be a paleontologist for a day in our dinosaur dig, and be a guest at an Ice Age dinner party. In this gallery there are over 30 skeletal reconstructions on display, including a Gryposaurus (duck-billed) dinosaur made of original fossil material, and the world's only display of 14 Ceratopsian (horned) dinosaur skulls.

**Sky-** Weather, climate, astronomy, and the sun are interpreted in this gallery with its adjacent rooftop terrace. Check out the views of the Salt Lake Valley and learn about some of the Museum's "green building" features from the Sky terrace.

**Utah Futures-** This thought-provoking environment—the Museum's crystal ball—is a place to explore pressing contemporary issues with local and global implications for the future. You are encouraged to participate in an engaging interactive game where you can see the results of your everyday individual choices play out and learn more about how they might affect Utah on a broad scale.

A permanent installation you may want to visit in good weather is a Geological timeline. It ends with the present at the building, then runs down and through the oak grove, going back millions of years.

Have the students record the exhibit(s) they need to visit to complete the assignment on their field trip paper or in their science notebooks.

### **Logistics**

Prepare your chaperones:

- communicate the purpose of the field trip to them
- provide them with a chaperone sheet with the names of the students in their groups and the exhibits they need to visit
- provide them with a bag that can hold all of the students' field trip supplies

## **At the Museum**

Make sure students have their field trip papers or science journals, writing tools, and their chaperones.

Determine a meeting time and space, and communicate that clearly to the students and chaperones.

Have the student groups go to the exhibits they have selected to gather facts. Give them time to explore, observe and record. Students can work individually or as a group. Walk around, talk with the students about what they are noticing and what they are thinking. If you see something that relates to their research, you can occasionally point it out to them. Help with identifying and reading information on panels.

When all of the students in the group have collected the information they feel is necessary to complete the assignment, they can give their supplies to their chaperone and explore the Museum. Of course, if they find other objects that seem to help refine their inferences, encourage them to record that data!

## **After the Museum**

Take some time to sit down and review the data that was gathered. If you did different dates, have the groups discuss what they think the information they have gathered means. If the whole class worked on the same date, discuss as a class.

Use the facts that were gathered at the Museum and the inferences that came from them to create pictures with captions, dioramas, an essay, or non-fiction chapter books to share the facts and inferences about the time period.

# Connecting “Time Machine” to Utah’s Science Core

## 2<sup>nd</sup> Grade Science Core Alignment

### **Standard 1:**

The Processes of Science, Communication of Science, and the Nature of Science. Students will be able to apply scientific processes, communicate scientific ideas effectively, and understand the nature of science.

### **Objective 1**

Generating Evidence: Using the processes of scientific investigation (i.e. framing questions, designing investigations, conducting investigations, collecting data, drawing conclusions)

- **Framing questions:** Observe using senses, create a hypothesis, and focus a question that can lead to an investigation.
- **Designing investigations:** Consider reasons that support ideas, identify ways to gather information that could test ideas, design fair tests, share designs with peers for input and refinement.
- **Conducting investigations:** Observe, manipulate, measure, describe.
- **Collecting data:** Deciding what data to collect and how to organize, record, and manipulate the data.
- **Drawing conclusions:** Analyzing data, making conclusions connected to the data or the evidence gathered, identifying limitations or conclusions, identifying future questions to investigate.

## 4<sup>th</sup> Grade Science Core Alignment

### **Standard 4**

Students will understand how fossils are formed, where they may be found in Utah, and how they can be used to make inferences.

### **Objective 2**

Explain how fossils can be used to make inferences about past life, climate, geology, and environments.

- Explain why fossils are usually found in sedimentary rock.
- Based on the fossils found in various locations, infer how Utah environments have changed over time (e.g., trilobite fossils indicate that Millard County was once covered by a large shallow ocean; dinosaur fossils and coal indicate that Emery and Uintah County were once tropical and swampy).