



Navigations 1

Teacher Guidelines



Navigations 1 is an inquiry guide that can be used to lead your students on an adventure through `Imiloa's Exhibit Hall. Activities in the guide complement “*The Secret of the Cardboard Rocket*,” the recommended planetarium show for first graders. Teachers and chaperones must help students navigate through the exhibits by directing them to specific locations and, if necessary, reading the text.

Navigations Teacher Guidelines for each grade level include learning outcomes, HCPS III Benchmarks, and Nā Honua Maui Ola Guidelines. Information on what to do before, during and after field trips is also provided. Teachers are encouraged to review these pages and use the information to prepare their students for a field trip to `Imiloa.

Navigations 1 Learning Outcomes

Students will:

- ◆ Investigate planets and other objects, such as meteors, in our Solar System.
- ◆ Discover the connection between stars and life on Earth.
- ◆ Explore Hawaiian voyaging and the jobs of crew on a sailing canoe.
- ◆ Use visual representations to collect and record simple data.

Pre-Visit Information

Teachers can use all or parts of the **Navigations 1** inquiry guide to enhance their students' experience at `Imiloa. To use the guide, teachers must download and print a copy of it for each student—and for each teacher and chaperone accompanying the group. Student inquiry guides are not available at `Imiloa.

For descriptions of all exhibits on display at `Imiloa, go to the Education-Field Trip website page. A map of the Exhibit Hall, which will help you find the specific location of each activity, is also available on that page.

Note: K-12 teachers can visit `Imiloa to orient themselves on the Center prior to their scheduled field trip at no charge. Pre-trip planning visits must be arranged in advance. Contact Gail Loeffler at 969-9729 or gloeffler@imiloahawaii.org to schedule.

The following text is designed to be used as a springboard for *pre-visit* discussion to inspire students' anticipation of their `Imiloa experience. However, it may also be used as a “script” for teachers and chaperones to guide students *during* their visit.

Introduction

Did you know that what you see in the night sky can tell you about who and where you are? During your field trip to `Imiloa, you will explore planets and other objects, such as meteors and meteorites, in our Solar System. In addition to voyaging out into space, you will also explore voyaging across the sea.

Recommendation to teacher: Begin your field trip with the planetarium show, “*The Secret of the Cardboard Rocket.*”

Piko

As you walk slowly through a representation of a koa forest, you will hear many sounds. What do you think they might be? Then, as you get near the model of Maunakea, day changes to night. Many people have walked up this sacred mountain and their stories are recorded in the journals on display in the Piko area. While you’re there, look up, down, and all around. What do you see?

Wow! Talk about this: You see a model of Lake Wai`au located on Maunakea. It’s a lake, but there are no fish. Why do you think that is?

Pushy Planets

Our Solar System is made up of the Sun, eight planets, and other celestial objects. We used to believe that there were nine planets in the Solar System, but in 2007, astronomers decided that Pluto is not a “real” planet. They now call it a dwarf planet. This shows how science changes as we learn more about our Universe.

Wow! Talk about this: Could there be other planets in our Solar System that we don’t yet know about?

“Watch out for falling rocks”

Have you ever seen a “falling star”? Those streaks of light in the night sky are not stars at all. They are meteors—pieces of comets, asteroids, and other space debris falling toward Earth. As meteors zoom through Earth’s atmosphere, air friction heats them up until they are so hot, they glow brightly (like yellow-hot coals in a fire). Most meteors burn up completely and never hit the Earth. Pieces that do not burn up and actually hit the ground are called meteorites.

Wow! Talk about this: Have you ever seen a meteor in the night sky? Rub the palms of your two hands together briskly. What do you feel? This shows how friction heats up meteors. What if there was no atmosphere around our planet to cause the friction that burns up meteors?

Cosmic Kitchen

To bake an apple pie, you have to first invent the Universe. That may sound strange, but it’s true. All life on Earth is made up of elements that originate in stars. The short *Cosmic Kitchen* theatrical production explores the 14-billion-year history of the Universe and the “recipe” for your own existence.

Wow! Talk about this: Our Sun is just one star in a “city of stars” known as the Milky Way Galaxy. Have you ever looked up at the night sky and seen the Milky Way? How did it look?

Voyaging

Before you can sail across the sea, you have to prepare for your voyage—from building the canoe to gathering all the things you’ll need to survive the long journey and settle a new land. Before and during a voyage, people must work together. Look at pictures in the displays on the lauhala sails to see what some of their jobs are. Note the image of a canoe deck on the floor.

Wow! Talk about this: Have you and your family ever taken a long trip? How did you plan for it? What did you do to prepare for it?

During Field Trip

Distribute Inquiry Guides to students and accompanying chaperones. Tell students which parts (if not all) of the guide they are to complete. Teachers and chaperones should work with students to help them complete the activities. Two of the activities (“Create a Planet” and the drawing on the last page) may be completed at school or home following the field trip.

You may also have your students view exhibits not covered in the activities—e.g., **4D2U**, which features two 3-D shows: a trip through the Universe and Aloha Subaru (about Subaru telescope); and **SOS** (Science on a Sphere).

Post-Visit – Suggested Activities to Extend the Experience

Apply knowledge gained through Navigations 1 in the following activities:

- ♦ Design and build your own “cardboard rocket.” Use your imagination and “blast off” to an unknown world. Record what you “see” and “hear” when you get there.
- ♦ Design and construct an airport on the Moon. Think of a name for it.
- ♦ Create an outline of a voyaging canoe on your classroom floor or playground. Decide what kind of crew is needed and who will do each job. Have students tell a story about what they did while “at sea.”

HCPS III Benchmarks

SC.1.1.2	Explain the results of an investigation to an audience using simple data organizers.
MA.1.1.1	Count whole numbers up to 100 in a variety of ways.
MA.1.11.1	Collect and organize information using concrete objects and pictures.
MA.1.12.1	Interpret data using simple language (e.g., more, less).
LA.1.1.12	Use new grade-appropriate vocabulary introduced in stories and informational texts.
LA.1.1.13	Use previous experiences to understand words in texts.
LA.1.2.4	Restate important information or ideas from a variety of texts.
LA.1.6.5	Use basic listening skills to focus attention on speaker and respond to message.
FA.1.1.5	Use familiar subjects and experiences to create original works of art.

Nā Honua Maui Ola Guidelines

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| 1.1 | Utilize a variety of learning materials and strategies that promote cultural traditions, language, history, and values. |
| 1.8 | Understand and appreciate the importance of Hawaiian cultural traditions, language, history, and values. |
| 4.7 | Utilize their knowledge, skills, and ways of knowing from their own culture to learn about the larger world community. |