

Investigating the Insides

Intended for ages 8 and up

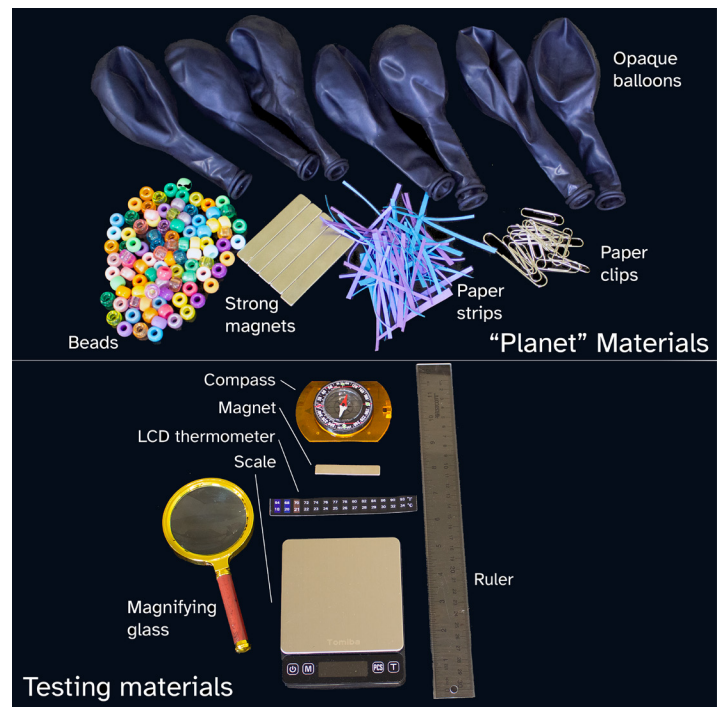
Modification and Preparation List

Adapt this NASA activity for your needs!

In-Person Library or Outreach Program

Materials (For each group of patrons):

- 5-7 extra-large dark blue balloons filled with air and other assorted material
 - *Note – Patrons should not be able to see the contents of inflated balloons. If you cannot find opaque balloons, insert one balloon inside another for each “planet.”*
- 2 compasses or magnets
- Paperclips
- 1-3 strong magnets, such as cow magnets (available from pet/farm supply stores or science education retailers)
- Scraps of paper
- 10-20 beads
- 5-10 marbles
- 2 small scales (such as postage scales)
- 2 liquid crystal temperature strips (available in most pet stores or stores that sell aquarium fish)
- 2 magnifying glasses
- *Optional:* Whipped cream from a bottle with a nozzle
- *Optional:* Water
- *Optional:* 2 laser pointers
- *Optional:* 2 ear thermometers
- *Optional:* video projector and screen



In-Person Library or Outreach Program (*continued*)

For each participant:

- [Investigating the Insides observation sheet](#)
- 1 pencil or pen

For the facilitator:

- [Activity Facilitation Guide](#)
- *Optional:* Background information
 - [STAR Net Blog: Investigating the Insides Fundamental Science Concepts](#)
 - [About Jupiter's Family Secrets background info](#)

Preparation:

1-3 months prior to the program:

- Review the activity facilitation guide and background information.
- [Watch the How-To Video](#)
- Order/gather materials.
- Prepare and distribute promotional materials for the activity, including flyers, posters, library website, online event calendar, and social media posts.

The day/week before the program:

- Prepare the balloons: Stretch out the balloon, then place items such as a magnet, one or more paperclips, several beads, or several marbles in it and inflate it. Consider adding some water from a faucet for some of the balloons. ***If you can see through an inflated balloon, use 2 balloons instead of one (placing one balloon inside another with the interior balloon's mouth extending out). Fill the interior balloon first, then tie it and push it into the exterior balloon, then inflate the exterior balloon.*** Repeat for each "planet" you would like to include.
- Print the observation sheets

Day of Program:

- Set out the balloon "planets," observation sheets, and remainder of the materials on a variety of tables for patrons to use.
- *Optional:* set up a video projector and screen, to show one of the videos to introduce the topic.
- Begin with introductions and an ice breaker, such as "What is your favorite planet?"

In-Person Library or Outreach Program (*continued*)

Day of Program (*continued*):

- Discuss Ocean Worlds. Invite patrons to share their ideas about what an ocean world is, and (optional) invite patrons to view one or more of the following videos:
 - [Are There Oceans on Other Worlds?](#)
 - [What You Need to Know About Ocean Worlds](#)
 - [Europa: Ocean World](#)
- Invite participants to use the provided tools to investigate the balloon “planets.” Use [Guide on the Side facilitation strategies](#), such as the question prompts provided in the activity facilitation guide.
- Conclude with a discussion about how the balloons might model some features of Ocean Worlds and how scientists might study an Ocean World.

Virtual Program

Materials:

In addition to the above materials, you will need:

- Computer and Internet access
- Web camera for full screen viewing
- Microphone
- *Optional:* If possible, include a second camera (such as an *ELMO Camera*) to focus on your hands while demonstrating the activity.

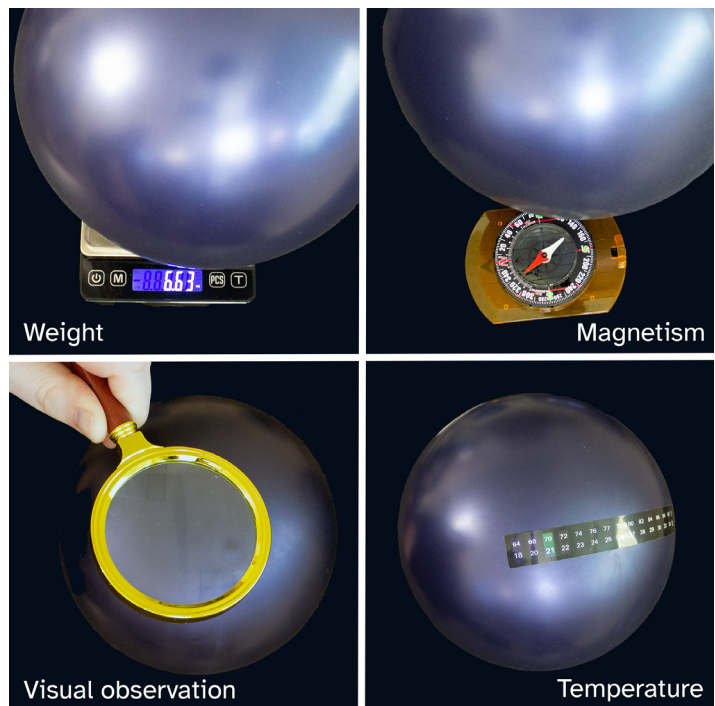
Preparation:

1-2 months before program:

- Set up a registration link for the program using an online platform such as Zoom, GoTo Meetings, or Facebook Live.
- Promote program on social media, library website, event calendar, etc.
- Watch the [NASA@ My Library STEAM Strategies: Virtual Programs video](#).
- Order/gather materials.

Week before program:

- Prepare three balloon “planets,” each with different materials. For example, put a magnet in one, paper clips in the second, and plastic beads in the third, so they will each have different weights and interactions with external magnets.



Virtual Program (*continued*)

Day of program:

- Set up and test your computer, camera, and microphone.
- Log in to your online platform account and open the meeting at least 15 minutes before the start of the program.
- Begin with introductions and an ice breaker, such as “what is your favorite planet?”
- Discuss Ocean Worlds. Invite patrons to share their ideas about what an ocean world is, and (*optional*) invite patrons to view one or more of the following videos:
 - [Are There Oceans on Other Worlds?](#)
 - [What You Need to Know About Ocean Worlds](#)
 - [Europa: Ocean World](#)
- Demonstrate the activity. Allow time for participants to discuss what they think is inside each of the balloon “planets.”
- Facilitate a discussion on how the balloons might model some features of Ocean Worlds and how scientists might study an Ocean World.
- Conclude by sharing your screen for patrons to view another of the videos.