Interstellar Explorer HEXO Family Mission Guide

BEFORE YOUR MISSION

1) Arrival at HEXO Spaceport One (5-minute discussion)

Welcome to **HEXO Spaceport One**, where humanity's future begins.
In the 25th century, HEXO was created to unite humanity around a shared mission:
to explore life beyond Earth.

Ask:

- Why do you think humans feel driven to explore beyond our planet?
- What would it feel like to leave Earth behind for good?
- Do you think exploration is about curiosity, survival, or something bigger?

🔬 **Science Spotlight**
Earth is the only known planet that supports life. Space is a vacuum—with no air, extreme temperatures, and intense radiation. Spacecraft must function as complete life-support systems.

🚀 **Mission Moment: Think Beyond Earth**
If you could send one message to the future, what would it say?

2) Preparing to Board the Interstellar Arc (5-minute discussion)

You are about to board the **Interstellar Arc**, one of HEXO's most advanced interstellar vessels.

- Length: **1,350 meters** (about 14 football fields)
- Population: **1,928 citizens**
- Speed: **4.2% the speed of light** (over 12,000 km/sec)

Ask:

- What would humans need to survive on a ship for generations?
- What kinds of roles would be essential to keep the Arc running?
- How would life in space be different from life on Earth?

🔬 Science Spotlight

The Arc uses **closed-loop systems** to recycle air, water, and waste—similar to systems used today on the International Space Station, but far more advanced.

🚀 Mission Moment: Pack for Space

You can bring only **three items**. What do you choose—and why?

AFTER YOUR MISSION

1) Cryosleep & Time Jump (5–10 minute discussion)

After boarding, you entered **cryogenic sleep**…
and awakened **262 years later** as the Arc approached Arcadia.

Ask:

- Why would people choose cryosleep for long journeys?
- What would it feel like to wake up in a completely different era?
- Would you choose to experience the journey—or skip ahead in time?

🔬 **Science Spotlight**
Cryosleep is still theoretical, but scientists are researching ways to slow human metabolism.
It could allow humans to survive journeys that last longer than a single lifetime.

🚀 **Mission Moment: Future Flash**
Imagine the world in the year **2668**. What has changed?

2) Life Aboard the Interstellar Arc (5-minute discussion)

The Interstellar Arc is not just a ship—it is a **self-sustaining civilization in motion**.

Ask:

- How would people build a functioning society in space?
- What challenges might come from living in a closed system?
- Why is cooperation essential for survival on the Arc?

🔬 **Science Spotlight**
The **International Space Station** is an early example of living in space. On the Arc, these systems are expanded to support nearly 2,000 people across generations.

🚀 **Mission Moment: Space Society**
Design your own space community.
What rules would keep people safe, productive, and connected?

3) Arrival at Arcadia & Cosmopolis (5–10 minute discussion)

You have arrived at **Cosmopolis**—a massive orbital city built to study Arcadia and prepare for human settlement.
Your destination: **Arcadia (Ross 128 b)**
Located **11 light-years from Earth**

Ask:

- What conditions are necessary for life to exist on a planet?
- Why might humans live in orbit before settling on a planet's surface?
- How would a new world change the way people live?

🔬 **Science Spotlight**
Arcadia is a **tidally locked planet**, meaning:

- One side is in constant sunlight
- One side is in permanent darkness
- Between them is a narrow **habitable zone**, where temperatures range from **-20°C to 30°C**—conditions that may support life.

Arcadia is:

- About **10% larger than Earth**
- Has **~30% more mass**
- Slightly **stronger gravity than Earth**

🚀 **Mission Moment: New World Builder**
If you were helping design humanity's first settlement, what would you build first?

4) Life Beyond Earth (5-minute discussion)
HEXO's mission is driven by one question:
Does life exist beyond Earth?

Ask:

- What kinds of life might exist on Arcadia?
- Why do scientists search for microbial life first?
- What discovery would change everything for humanity?

🔬 **Science Spotlight**
On Arcadia:

- Microbial life exists on land
- More complex life may exist in deep oceans on the dark side

This is similar to how life on Earth existed **400 million years ago**.
Scientists search for **biosignatures**—chemical signs of life like oxygen or methane.

🚀 **Mission Moment: Alien Encounter**
Imagine a lifeform adapted to Arcadia's environment. What does it look like?

5) Post-Mission Reflection (5-minute discussion)
You've completed your mission. Now reflect on what comes next.

Ask:

- What part of the experience felt most real to you?
- What did you learn about space, science, or the future?
- Do you think humans will one day live beyond Earth?

🔬 **Science Spotlight**
Earth remains uniquely suited for life due to its atmosphere, water, and protective magnetic field—making it incredibly rare and valuable.

🚀 **Mission Moment: Earth Check**
What makes Earth worth protecting?

🌟 Did You Know

- The Interstellar Arc travels at **4.2% the speed of light**
  → That's over **12,000 km per second**
  → Fast enough to reach the Moon in **about 30 seconds**
- The mission spans **262 years**, with passengers traveling through time via cryosleep
- The ship carries **1,928 people**, forming a fully functioning space community
- The Arc is **1,350 meters long**—14 football fields end to end
- Arcadia (Ross 128 b) was discovered in **2017** by astronomers in Chile
- Arcadia's surface is divided between extreme heat and cold—but a narrow zone may support life

👨‍👩‍👧‍👦 Parent Guide: Science Behind the Mission

- Cryosleep is theoretical but actively researched
- Closed-loop systems recycle essential resources
- The ISS is a real-world model for space living
- Exoplanets are planets beyond our solar system
- Tidally locked planets create extreme environments
- Biosignatures help scientists detect life
- Stronger planetary mass = stronger gravity

🔭 Want to Learn More?

🌐 **NASA Space Place:** https://spaceplace.nasa.gov

🚀 **NASA Kids Club:** https://www.nasa.gov/kidsclub

🛰️ **International Space Station:** https://www.nasa.gov/iss

🌌 **Exoplanet Exploration:** https://exoplanets.nasa.gov

📚 **Books**

- *Astrophysics for Young People in a Hurry* — Neil deGrasse Tyson
- *Welcome to the Universe (Young Readers Edition)*
- *The Mysteries of the Universe* — Will Gater

Your Next Voyage Awaits
InterstellarArc.com