



# Near & Far Card Game

Developed by: Dr. Cherilynn Morrow, [morrow@spacescience.org](mailto:morrow@spacescience.org)

Adapted by Brad McLain, [mclain@spacescience.org](mailto:mclain@spacescience.org)

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## **Summary:**

In this simple and engaging activity, learners will sort images according to distance from the Earth and gain a basic understanding for the scale of distances in the universe. We recommend using it in workshops, camp-ins, with school groups, for family events, and on the exhibit floor near the “Powers-of-Ten” display.

## **Learning Goals:**

Learners will come away with an understanding that:

- o There are several different kinds of objects phenomena in the Universe
- o They are located at different distances from us
- o They can be organized by their relative distance from us and each other

**Length:** 3-5 min

**Ages:** 5 & Up (ages 5-9 best with adult facilitation/collaboration)

## **Materials You Will Need:**

- o **Table** (chairs optional)
- o **Picture Cards:** These are included at the end of this document under “Full Size Images for Cards.” Simply print and then cut out. We recommend laminating the picture cards for multiple use. Note that you can also print out the pictures at 4-per-page to make smaller cards if you choose.

## **Key:**

*Italicized Text* is suggested script

## **Tips:**

This game is an excellent engagement activity for learners to begin thinking about our place in space and the relative distances from us of objects in the universe. When facilitating this game, get participants to think. Strive to be “a guide on the side” by encouraging questions, asking your own questions, and offering hints rather than imposing “right and wrong” answers. In this way, the game becomes much more a discovery process for learners and the role of the facilitator is to pose challenging questions and offer hints and clues along the way.

PowerPoint versions available for download on the Space Science Institute web site at [www.alienearts.org](http://www.alienearts.org) and [http://www.spacescience.org/education/instructional\\_materials.html](http://www.spacescience.org/education/instructional_materials.html)

Thanks to:

Preston Dyches for researching the distances between objects and Earth  
Michael Zawaski and Preston Dyches for help with formatting the images

### **Facilitator Instructions:**

#### **Step 1: Start with the cards mixed up each time.**

*I am going to show you ten images. You must put the objects in these images in order from nearest to the surface of Earth to farthest from the surface of Earth.*

#### **Answers:**

1. Eagle
2. Jet
3. Aurora
4. Hubble Space Telescope
5. Moon
6. Sun
7. Saturn
8. Orion Constellation and Nebula
9. Andromeda Galaxy
10. Hubble Deep Field View

#### **Step 2: Offer Hints as Needed:**

Ask the students to respond to these hints before showing the solution, when offering help. You can give one or more hints as needed.

Eagle Hint: Eagles soar in the sky searching for prey on the ground.

Jet Airplane Hint: Usually, jet airplanes fly above the clouds in the stratosphere, at more than 10 kilometers (6 miles) above the surface of Earth.

Aurora Hint: Auroras are found in the highest regions of Earth's atmosphere.

Hubble Hint: The Hubble Space Telescope orbits around the Earth at an altitude of about 369 kilometers (353 miles).

Moon Hint: The space shuttle can't go to the Moon but it can go to service and repair the Hubble Space Telescope.

Earth-Moon-Sun Hint: The distance between the Sun and Earth is 400 times greater than the distance between the Moon and Earth.

Saturn Hint: Earth orbits the Sun at a distance of 1 AU (Astronomical Unit). Saturn orbits the Sun at a distance of 10 AU.

Orion Constellation Hint: Stars that we see at night are all within our Milky Way galaxy.

Galaxy Hint: If you can see the spiral structure of a galaxy, like in this image, it is certain to be outside of our own Milky Way galaxy.

Hubble Deep Field Hint: Each blob of light in this image is an entire galaxy made up of hundreds of billions of stars.

## **Frequently Asked Questions:**

### **Why do the Sun and the Moon appear to be the same size in the sky?**

The diameter of the Sun is 400 times greater than that of the Moon, but the Sun is 400 times farther from Earth than the Moon. That is why you can see a total eclipse of the Sun, during which the Moon blocks the light from the Sun.

### **How far from Earth's surface are auroras?**

Auroras are found from 95 to 190 kilometers (about 60-120 miles) above the Earth's surface.

### **How far from Earth's surface is the Hubble telescope?**

The Hubble telescope orbits around Earth at a distance of 600 kilometers (373 miles).

**How far from Earth is the Moon?** The Moon is about 400,000 kilometers (250,000 miles) from Earth.

### **How far from Earth is the Sun?**

The Sun is 1 Astronomical Unit = 150,000,000 kilometers (93 million miles) from Earth.

### **How far from Earth is Saturn?**

From 9 AU to 11 AU. It depends on which side of the Sun Saturn is on, relative to Earth.

### **How far away are the stars we see at night?**

That depends on the star. The brightest stars of the Big Dipper, for example, are between 70 and 100 light-years from Earth. A light year is about 10 trillion kilometers (6 trillion miles). 10 trillion = 10,000,000,000,000. But the stars we see at night are all within our own Milky Way galaxy.

### **How far is the galaxy in the image from Earth?**

The Andromeda galaxy, M31, is more than 2 million light years from Earth.

# Soaring Eagle



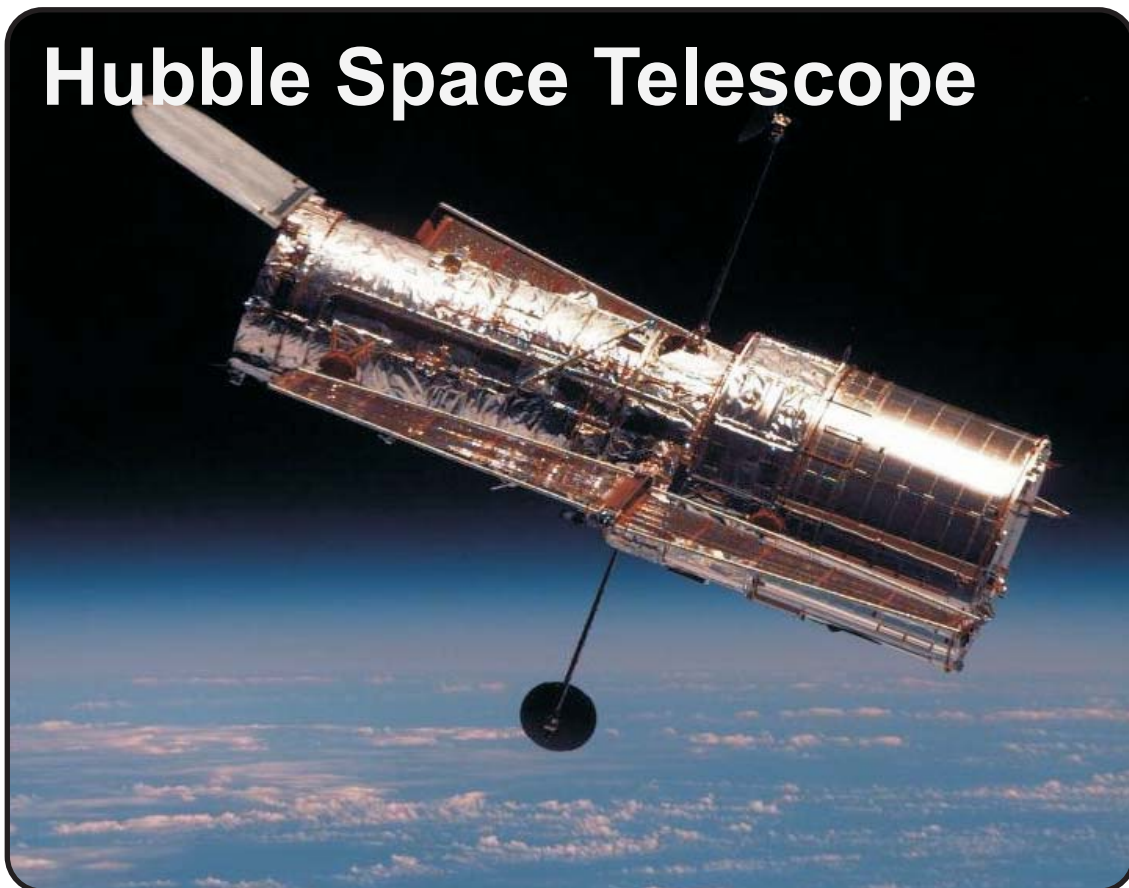
# Jet Airplane

At Cruising Altitude





**Aurora**  
Northern Lights

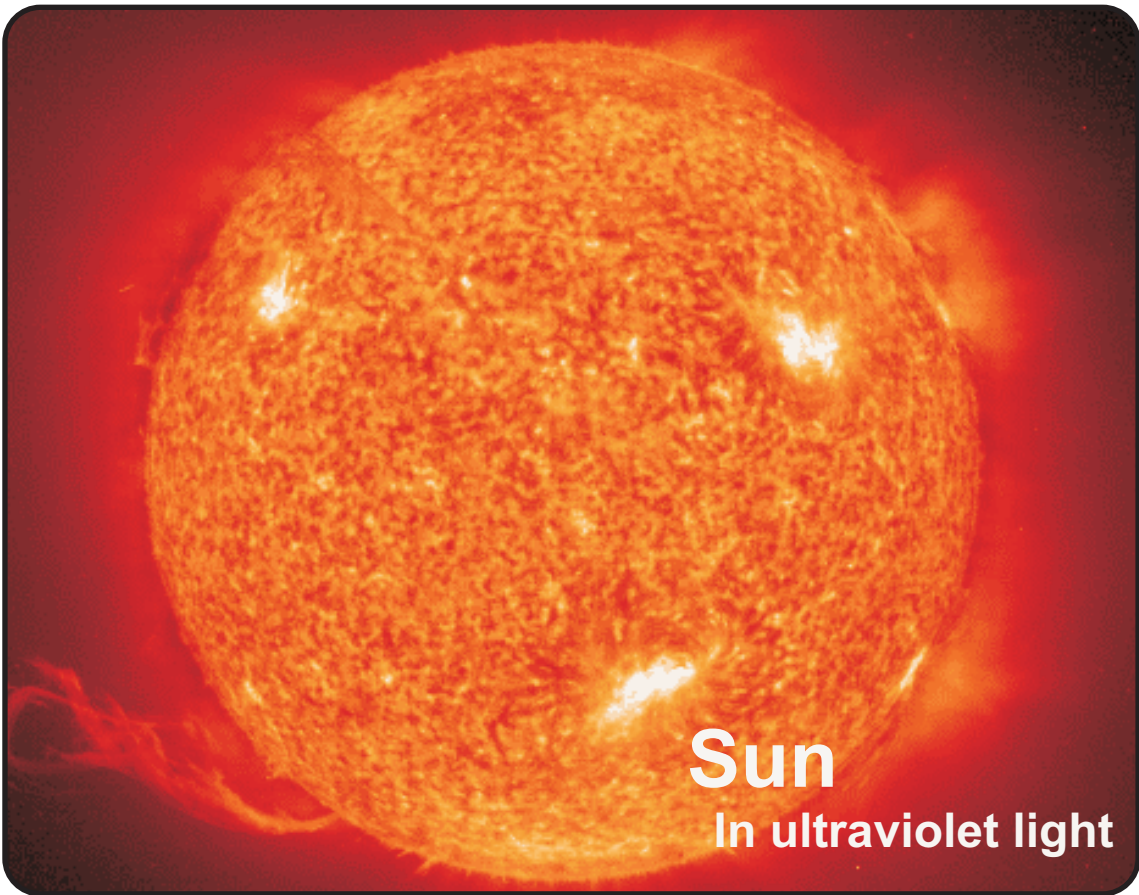


**Hubble Space Telescope**





**Moon**



**Sun**  
In ultraviolet light

# Saturn



# Orion

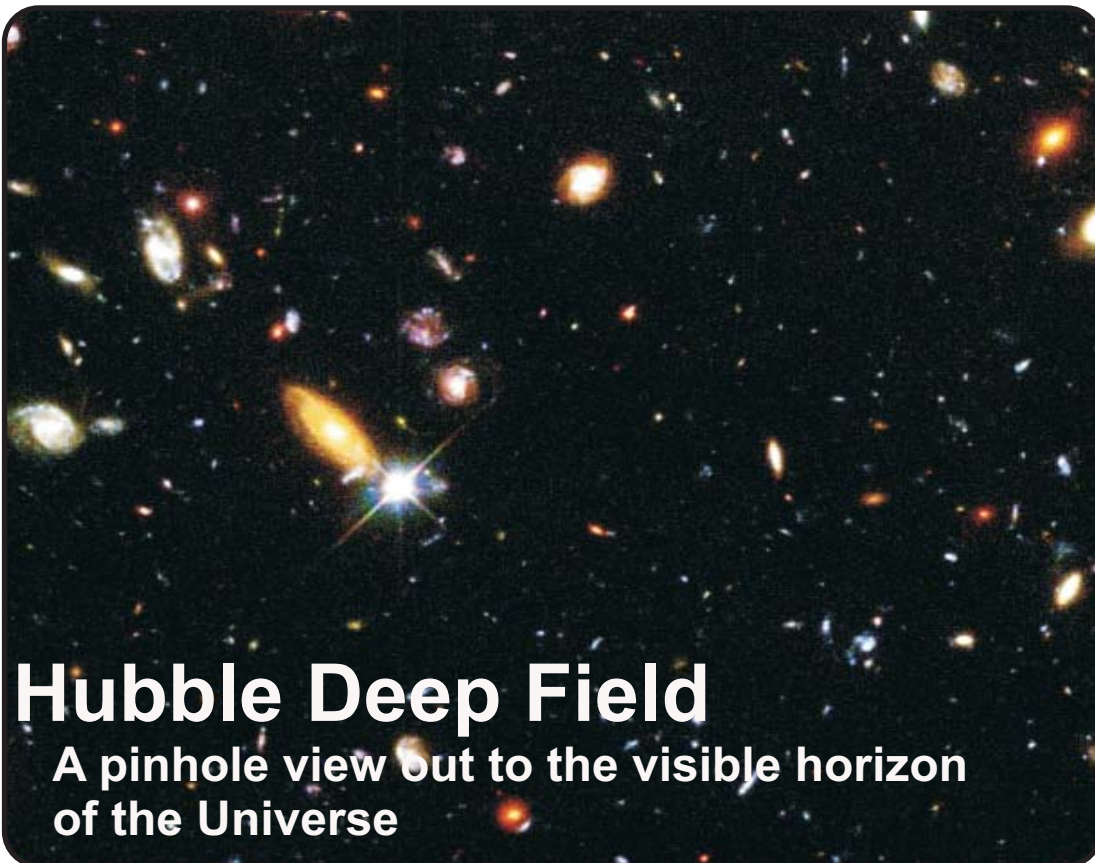
Constellation & Nebula







**Andromeda Galaxy**



**Hubble Deep Field**

A pinhole view out to the visible horizon  
of the Universe