

# Utterly Alien

## Vocabulary:

atmosphere,  
utterly, volcanoes,  
astronomer, spires

## Sneaky Preview! True or False??

Pluto is a double  
planet. T. F.

"New Horizons" is the  
name of a NASA  
spaceship. T. F.

Pluto spins on its  
side. T. F.

## Treasure Hunt!

On the internet, go  
to the Hubble Space  
Telescope home  
page:  
<http://hubblesite.org>

This is a great place  
to find pictures of  
planets. Explore  
the site and see how  
many planets you  
can find. Make a  
list of the ones  
Hubble has  
photographed.

Did you find any  
pictures of Pluto?  
Were they crisp and  
clear, or dark and  
fuzzy? What's your  
opinion? Is it time  
to get a closer look  
at Pluto?

There is a planet in our solar system so cold that in winter its atmosphere freezes and falls to the ground. The empty sky becomes perfectly clear, jet-black even at noontime. You can see thousands of stars. None of them twinkle.

The brightest star in the sky is the Sun, so far away and tiny you could cover it with the head of a pin. There's a moon, too, so *big* you can't blot it out with your entire hand. Together, moonlight and sunshine cast a twilight glow across the icy landscape revealing ... twisted spires, craggy mountains, frozen volcanoes?

No one knows, because no one has ever been to Pluto.

"Pluto is an utterly alien world," says Alan Stern of the Southwest Research Institute in Colorado. "It's the only planet never visited or photographed by NASA spaceships."

That is about to change. A robot spaceship called New Horizons will blast off for Pluto in January 2006. It's a long journey: 6 billion miles. New Horizons won't arrive until 2015. (How old will you be then?)

"I hope we get there before the atmosphere collapses," says Stern, the mission's leader. Winter is coming to Pluto. It is warm enough now for Pluto's air to float, but it won't be for long. The temperature is dropping to -400 F (four hundred degrees below zero). Imagine seeing a planet's atmosphere collapse--New Horizons might!

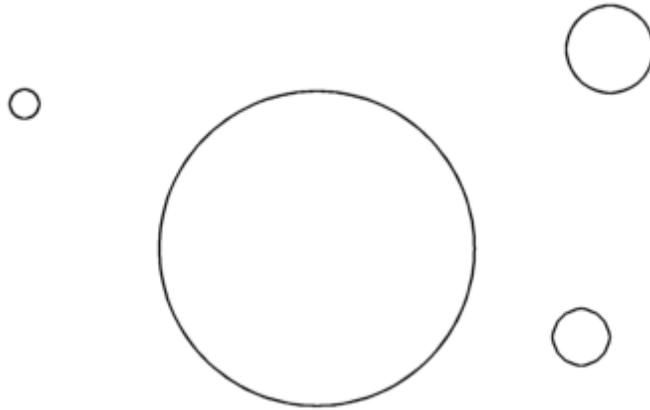
"This is a flyby mission," says Stern. Slowing the spacecraft down to *orbit* Pluto "would burn more fuel than we can carry." New Horizons will glide past Pluto snapping pictures as quickly as it can.

The cameras will also target Pluto's moon, Charon. Charon is half the size of Pluto and the two circle one another only 12,000 miles apart. For comparison, Earth's Moon is 239,000 miles from Earth. Pluto and Charon are close together! Astronomers call them a "double planet."

Astronomers believe that Pluto and Charon were created billions of years ago by some terrific impact, which split a bigger planet into two smaller ones. Consider this: Pluto and Charon spin on their sides. Something knocked them over.

What a strange place! It is probably stranger than we think. New Horizons will let us know.

**Pluto Logic:** The circles below are four worlds: Earth, the Moon, Pluto and Charon. Your job is to label them. The biggest is Earth. The smallest is Charon. Pluto is smaller than the Moon. That's all the information you need. Start labeling!



**Cool Conversions:** Look at this table. It tells you the diameter of Earth, the Moon, Pluto and Charon in miles. Convert miles to kilometers. It's easy. Miles times 1.6 equals kilometers. Use your calculator to fill in the table.

	Diameter (miles)	Diameter (kilometers)
Earth	7,926	7,926 miles x 1.6 = 12,681 km
the Moon	2,160	
Pluto	1,413	
Charon	728	

**Double Planets:** Now get some scissors and a ruler. Cut out the circles at the top of the page--the ones you labeled Earth, the Moon, Pluto and Charon.

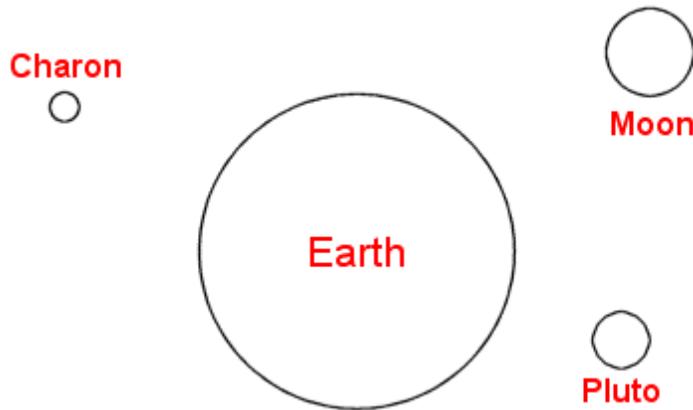
You are going to make a "scale model." A scale model is a small copy of something. Your scale model will show Charon orbiting Pluto and the Moon orbiting Earth. In your model, 1 inch equals 4000 miles.

Pluto and Charon are 12,000 miles apart. That's 3 inches in your scale model. Put your Pluto-Charon cut-outs on the floor 3 inches apart. Use your ruler to measure the distance.

Earth and the Moon are 239,000 miles apart. That's about 60 inches (5 feet) in your scale model. Put your Earth-Moon cut-outs on the floor 60 inches apart.

**Which pair looks more like a double planet? Earth-Moon or Pluto-Charon?**

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	Diameter (miles)	Diameter (kilometers)
Earth	7,926	7,926 miles x 1.6 = <b>12,681 km</b>
the Moon	2,160	<b>3456 km</b>
Pluto	1,413	<b>2260 km</b>
Charon	728	<b>1165 km</b>

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