

Grades: 6-8

Nova - The Planets: Ice Worlds

In the far reaches of the solar system, Uranus and Neptune dazzle with unexpected rings, supersonic winds and dozens of moons. And NASA's New Horizons gets a stunning up-close view of Pluto before venturing deep into the Kuiper Belt.

After watching this episode, choose from the following questions and/or tasks to extend your learning

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| <ul style="list-style-type: none"> • Absolute zero is measured in Kelvin, can life exist under these pressures and temperatures? Why or why not? • Explain how planet gravitational acceleration helps Voyager travel 900 million miles more. • Neptune is 2.8 billion miles away, how is that measured? • Why does Neptune have an atmosphere and not Uranus even though it is further away from the sun? • How did we discover the Kuiper Belt objects and explain the zone in which it resides? |
| <ul style="list-style-type: none"> • What are the similarities and differences between Saturn and Uranus rings? • The Shepherd Moons get their names because they orient the rings on Uranus. Explain how they lead the rings in their orbit. • Why do Venus and Uranus spin in the counterclockwise direction? • How did Uranus tip on its side? • How does intense geological activity and gases produce geysers in Triton? • Hibernation was first used in New Horizon, what was the purpose/ challenges of using this new technology? • According to the International Astronomical Union what is the criteria that objects need to meet in order to be classified as a planet? • Explain various gaseous regions of Pluto like Tombaugh Region (Pluto's Heart), Sputnik Planitia and why are there no impact craters? |
| <ul style="list-style-type: none"> • Exploring Space Science Mathematics |
| <ul style="list-style-type: none"> • Make a walking replica of the distance of the solar system from the sun to all its satellites. • Make a model of Pluto and replicate the polygonal patterns on its Heart? • Listen to Gustav Holst's <i>The Planets, Mvmt VI, Uranus, The Magician</i>. Explain how Holst used the elements of music to capture the essence of the planet Uranus. What compositional devices and expressive qualities did Holst use that connects the music to |

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the title of the movement; *The Magician*.

- Listen to Gustav Holst's *The Planets, Mvmt VII, Neptune, The Mystic*. Explain how Holst used the elements of music to capture the essence of the planet Uranus. What compositional devices and expressive qualities did Holst use that connects the music to the title of the movement; *The Mystic*.
- Explore a geyser near your home and explain its phenomena.
- Finish answering the questions below for this episode:
 - What's keeping mankind from doing more in space?
 - What opportunities does our solar system present?
 - What kind of careers/businesses might be needed in our future to take advantage of those opportunities?
 - Take the answers you have collected over the week and develop your own aerospace company, by answering some basic questions that would be expected in a business plan:
 - My company name will be: _____
 - My business purpose is: _____
 - My product or service will be: _____
 - I will promote my product or service by: _____
 - What makes my product/services unique and desirable is: _____
 - The strengths of my business will be: _____
 - The weaknesses of my business will be: _____
 - I see the following opportunities for my business: _____
 - I see the following threats/challenges for my business: _____
 - Draw a company logo
 - Develop a company slogan
- Put all this information into a professional brief that you would be proud to present to an investor/banker. Professionally present your business plan to a family member or friend.