Advanced Science & Engineering Distance Learning Week 2

Design an Alien project

First watch the video at www.discoveryeducation.com titled "*The Search for a Second Earth*." It is part of the series "How the Universe Works". Answer the following questions as you watch the video.

1. What is an exoplanet?

2. How did the Kepler telescope detect exoplanets?

3. How many Earth-like planets do scientists predict are out there in the universe?

4. What molecule is probably the most important in supporting life?

5. Describe the different considerations of a 'goldilocks zone'.

6. Explain what the dark bands in the spectrum tell us.

7. Why is the Earth's magnetic field so important to us?

8. What tools are being used to detect other earth-like planets?

9. Describe what a super-Earth might be like.

10. What is a green-zone of a galaxy all about?

Now, do a little research of our own solar system. Look at the different planets AND moons that orbit those planets. Choose one (planet OR moon) that interests you and research this planet or moon. Find out some information such as the atmosphere, the gravity, the temperatures (highs and lows), the size, composition, distance from the sun and other interesting information. Record that information here:

Name of celestial body: _____ Is it a planet, moon, or dwarf planet? _____

Description of atmosphere:

Description of gravity:

Temperatures:

Size:

Composition:

Distance from the sun:

Other interesting information:

Life can be found almost anywhere on Earth, from the poles to the equator, from the bottom of the sea to miles above the surface, and from dry valleys to groundwater miles below the Earth's surface. Over the last 3.7 billion years or so, life on the Earth has adapted to almost every environment imaginable. But what is it about Earth that makes it so perfectly suited to supporting life?

- Distance from the sun(star)
- Water
- Gravity
- Atmosphere(gasses)

Think of all the living things on this planet and pick two to study further. Something big, and something small, maybe even microscopic! Make sure the two living things you select are from two different kingdoms and list them in the data table at the top. (see week 3)

Continuing from last week.

Find out more about these living things you have selected. Record information in the table below.

Information on living things	You (human being)	Living thing 1:	Living thing 2:
How the exchange of gasses happens	Intake of air through nostrils and mouth go into lungs. Oxygen is absorbed and carbon dioxide is exhaled.		
Food source	Omnivores – eats both plants and animals, proteins and carbohydrates important		
Adaptations for food	Teeth designed for eating variety of food, incisors and canines, stomach has acid for digestion, hands for holding and preparing food		
Protection from heat and/or cold	Mammal- has some hair but has to wear clothing to keep warm, layer of fat only found in certain individuals, sweat glands in case of heat		
Protection from cosmic radiation	None. Has to rely on planets magnetosphere (magnetic field)		
A way to sense their environment	Eyes, nose, ears, touch and taste all allow humans to detect their environment. Color vision.		
A way to move	Legs for mobility. Arms aid in swimming but not very strong swimmers. No wings present.		

Now use your imagination and creativity to combine what you have learned about a planet or moon and adaptations of living things found on Earth.

Design an Alien that would be suited to survive on the planet or moon you researched. Think about these aspects:

- a way to breathe
- a food source
- protection from heat and/or cold
- protection from cosmic radiation
- a way to sense their environment
- a way to move (based on strong/weak gravity)
- size (metric units)

You can design your alien in any way your imagination and creativity will allow you to do. You can draw it out on paper, provide color and labels, similar to the example you can see on the next page. OR if you want you can create it on the computer.

https://education.abc.net.au/res/i/L755/index.html
https://www.thegnomonworkshop.com/tutorials?tags[]=creature-design

These websites might give you some ideas to get the creative juices flowing.

Be sure that the adaptations you are giving your alien creature are suited for the environment of the planet or moon you researched earlier. Use the example on the next page to help you figure out how your project can look.

DESIGN YOUR ALIEN

