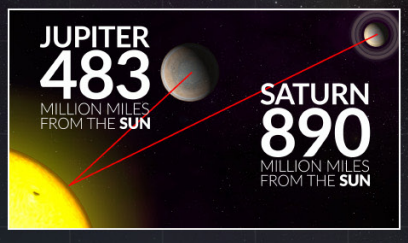
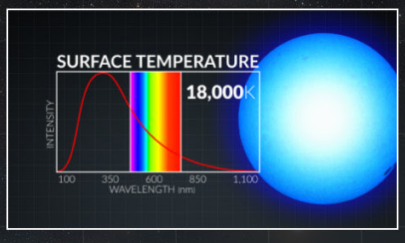
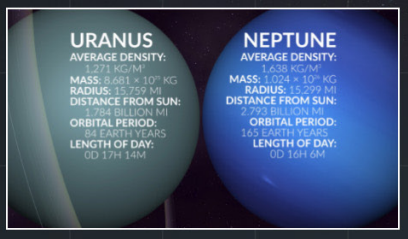
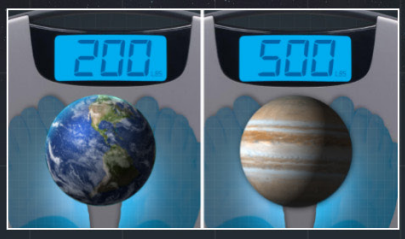
BEYOND THE STARS

SEEING COSMIC DESIGN









Workbook by Alana May, M.S.

OUR COMPLEX COSMOS

BEYOND THE STARS

Fast Facts

1. The word _____ is used to describe the observed order and design in nature.

2. (True or False) Our Universe exists as a chaotic collection of space and matter.

Application

From the list below, circle where we find complex order.

Atoms Spiral Galaxies Human Cells Stars

Designed by God

What does the presence of law, matter, function, and complexity demand and why?

Challenge

Describe how the Periodic Table shows order and design in nature.

OUR VAST COSMOS

BEYOND THE STARS

Fast Facts

1. Earth's nearest neighbor is the _____.
2. (True/False) The asteroid belt lies between the Terrestrial planets and the Gas Giant planets.
3. Our galaxy, called the _____, is one of billions of galaxies in the Universe.

Application

Put the following objects in order from smallest to largest: Galaxy, Universe, Earth, and Solar System

Designed by God

When we look at the design and complexity we see around us and throughout the Cosmos, is it reasonable to conclude that it came from chance and chaos?

Challenge

List the components that make up our Solar System.

OUR FINE-TUNED COSMOS

BEYOND THE STARS

Fast Facts

1. Science tries to show what we see in nature through the use of _____ .
2. (True or False) The relationship for the force of gravity between two objects shows a finely-tuned balance for the overall strength of gravity's force.

Application

What are the four fundamental forces of nature?

Designed by God

List some ways the video mentioned that demands an Intelligent Creator:

Challenge

Write out the equation given for the gravitational relationship between two masses.

Who created this relationship? (Note, the answer is not who discovered that this equation works.)

THE PLANET MERCURY

BEYOND THE STARS

Fast Facts

1. Mercury is the _____ planet in our Solar System.
2. The Earth's average distance from the Sun is 93 million miles. What is Mercury's average distance? _____ miles
3. At 105,000 miles per hour, Mercury has the **(smallest / largest)** orbital speed of any planet in our Solar System. (*circle the correct answer*)
4. Mercury takes _____ days to make one complete orbit around the Sun.

Application

Mercury and the Moon have many similarities, but also several unique features. From what you know about the Solar System and what you learned in "Beyond the Stars: Mercury," use the table below to sort out their similarities and differences.

Unique to Mercury	Similar on Both	Unique to the Moon

Designed by God

In contrast to Earth, list 3 reasons why Mercury was NOT designed for life to thrive:

_____ _____ _____

Challenge

In the space provided below, explain what phenomenon causes Mercury's 'day' to be longer than its 'year.' (Hint: Consider Mercury's 'orbital resonance.')

THE PLANET VENUS

BEYOND THE STARS

Fast Facts

1. The planet Venus is the brightest object in the sky after the _____ and the _____.
2. Venus is the closest planet to Earth in its orbit and is nearly identical to Earth in its _____ and _____.
3. 2 Peter 1:19 alludes to Venus as the _____.

Application

How did the Magellan spacecraft help scientists learn more than ever before about Venus?

Designed by God

In contrast to Earth, list some reasons why Venus was NOT designed for life to thrive:

Challenge

Why did some ancient astronomers think that Venus was two objects?

THE PLANET MARS

BEYOND THE STARS

Fast Facts

1. Mars is sometimes referred to as the Red Planet. Its hue comes from sunlight illuminating the planet's reddish-brown _____.
2. Geological features found on Mars include: _____, _____, _____, and _____.
3. _____ is the tallest mountain in the solar system and extends _____ miles above the Martian surface.

Application

Water is essential for plants, animals, and humans to survive and grow. What are some reasons why Mars lacks any visible liquid water?

_____

_____

_____

Designed by God

In contrast to Earth, list some reasons why Mars was NOT designed for life to thrive:

_____ _____ _____

_____ _____ _____

Challenge

What causes the similarities between Earth's and Mars' seasonal variations and length of daytime hours?

BEYOND THE STARS

THE PLANET JUPITER

Fast Facts

1. Jupiter is the _____ and _____ planet in our Solar System and is nicknamed “The King of Planets.”
2. Jupiter is the _____ planet out from the Sun and _____ times farther out than Earth.
3. Jupiter's diameter is _____ times larger than Earth's diameter.

Application

Describe some differences between Terrestrial planets (like Earth) and Gas Giant planets (like Jupiter).

Designed by God

In what ways are the moons orbiting around Jupiter similar to the planets orbiting the Sun?

How does Jupiter and its system of moons show God’s design for the laws of nature?

Challenge

List Jupiter’s four Galilean moons, and write down some unique aspects for each moon.

THE PLANET SATURN

BEYOND THE STARS

Fast Facts

1. Saturn is the _____ planet from the Sun and the _____ largest Gas Giant.
2. Saturn's rings are not one solid structure, but are actually composed of individual objects of various sizes and shapes. (True / False)
3. Saturn's rings are divided into _____ ring groups that are separated by gaps.
4. Saturn's largest moon, _____, is the only moon in our Solar System known to have a dense atmosphere.

Application

How far does Saturn's ring system extend?

_____

How thick is Saturn's ring system?

_____

Designed by God

What are some ways that Saturn shows God's design?

_____

_____

_____

Challenge

What makes the period of Saturn's "Ring Plane Crossing" so important?

BEYOND THE STARS

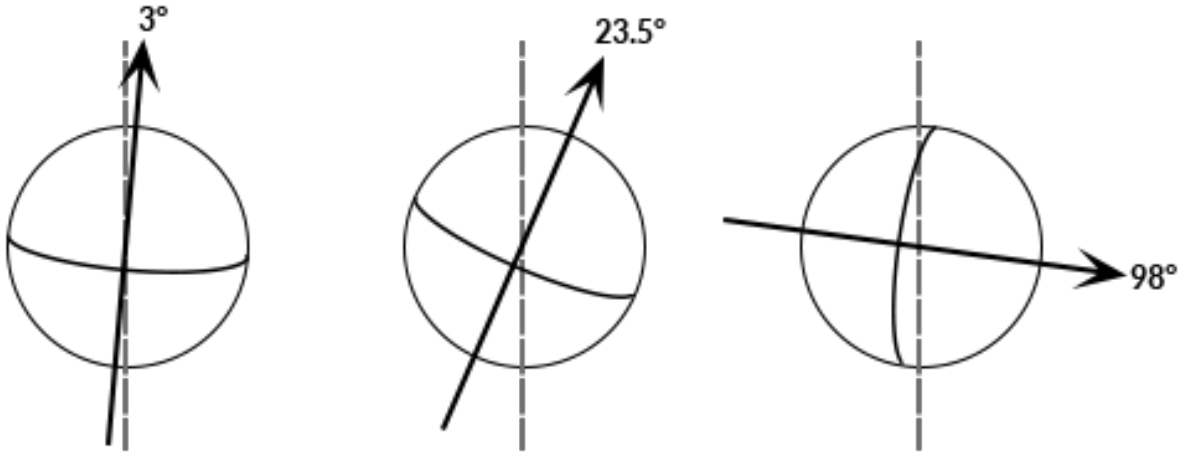
THE PLANETS URANUS AND NEPTUNE

Fast Facts

1. Uranus and Neptune are the _____ and _____ planets out from the Sun, and are classified as _____ (like Jupiter and Saturn).
2. Neptune has the highest _____ in the Solar System, nearly 1,200 mph.
3. Neptune completes one rotation every _____ hours.

Application

Label the correct planet below based on its axial tilt. Choose from Uranus, Jupiter, and Earth.



Designed by God

The Universe is bound by physical laws that God put into place during the Creation Week. How did scientists use these observable and repeatable laws to discover Neptune in 1846?

Challenge

What are some of the effects that Uranus' extreme planetary tilt has on the planet?

EARTH'S MOON

BEYOND THE STARS

Fast Facts

1. Earth's Moon is the _____ object in the night sky.
2. The light we see from the Moon is _____ light coming from the Sun.
3. Genesis 1:16 says that the Moon was created as "the _____ light to rule the night."

Application

Write out the monthly cycle of the Moon starting with the New Moon.

1. New Moon	2.	3.	4.
5.	6.	7.	8.

Designed by God

List three ways the Moon was designed to benefit Earth:

1. _____

2. _____

3. _____

Challenge

Describe the differences between a lunar eclipse and a solar eclipse.

THE SUN

BEYOND THE STARS

Fast Facts

1. The Sun is _____ times wider than Jupiter and over _____ times wider than the Earth.
2. The Sun's volume could contain about one thousand Earths. (True/False)
3. The Sun contains 99.86% of all the mass in our Solar System. (True/False)
4. The Sun acts as a _____ to hold all the objects in our Solar System in orbit.
5. _____ are cooler, dark regions on the Sun's surface that form because of disturbances in the Sun's magnetic field.

Application

Draw a line to match the layer of the Sun with the correct features you would expect to see on it.

Photosphere	Coronal loops
Chromosphere	Sunspots
Corona	Solar prominence and solar filaments

Designed by God

What are some ways that the Sun is finely tuned for life to thrive on Earth?

Challenge

Why does the Sun appear yellow?

THE STARS

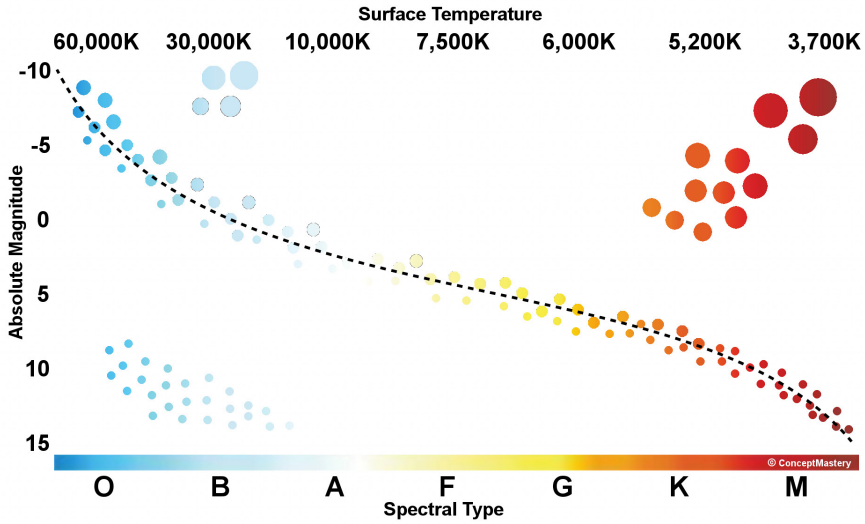
BEYOND THE STARS

Fast Facts (*Answer the following questions.*)

1. There is a great diversity of stars. The 2 easiest traits to see with our eyes are a stars _____ and _____.
2. The color of a star relates to its temperature, where red stars are _____ than blue stars.
3. The apostle Paul referenced the diversity of stars when he wrote, "one star differs from another star in _____" (1 Corinthians 15:41).

Application

Label the regions of the Hertzsprung-Russell (HR) Diagram with the appropriate star classifications.



Designed by God

God's design can be seen in the diversity of the stars. Give two characteristics of stars that show their complexity and order in the Universe.

Challenge

God designed our Sun to be a stable Main Sequence star. If our Sun was a Supergiant star, Earth's orbit would be inside of the star and we would be burned up. What would the conditions on Earth be if our Sun was a White Dwarf star?

BEYOND THE STARS

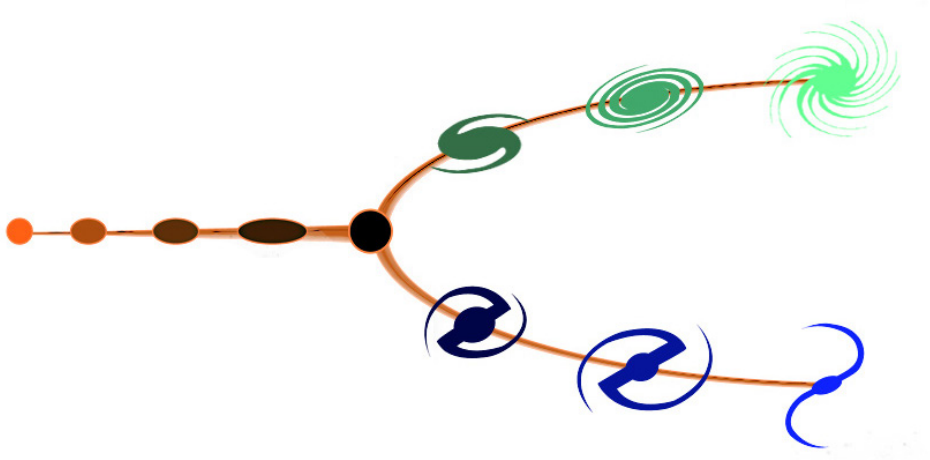
THE GALAXIES

Fast Facts (Answer the following questions.)

1. As _____ improved and their ability to gather light became better, scientists were able to observe faint, extended objects such as distant comets, nebulas, and other curious objects.
2. By the 1920s astronomers had evidence that objects once thought of as spiral nebulas were actually very distant collections of stars, gas, and dust _____ together.
3. Like spiral galaxies, elliptical galaxies have a lot of visible structuring. (True/False)

Application

Label the galaxy branches of the Hubble Tuning Fork below. Choose from Barred Spiral, Non-barred Spiral, and Elliptical galaxies.



Designed by God

The video described mankind's role in the Universe in what two ways?

1.

2.

Challenge

What are some examples of how we know our cosmos is vast?