STUDY GUIDE

AWESOME SCIENCE MEDIA PRESENTS EPISODE 5 "Our Incredible Sun"

THEHEAVENS

A DVD Series exploring the scientific evidence which supports the Biblical worldview for the formation of the universe

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Presents:

The Heavens Declare – Episode 5 **"Our Incredible Sun"** Study Guide

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Introduction

Welcome to this study guide for the *Heavens Declare - Episode Five, "Our Incredible Sun"*. This guide is designed to be used by youth groups, Sunday schools, church groups, public school parents that want to reinforce their student's faith, or anyone that wants to go deeper in their understanding of the concepts presented in the video. It can also serve as curriculum for homeschool students.

Like the video, this study guide is broken-up into 10 different sections. Please start by watching a chapter of the video, and then complete the accompanying section in this guide. You will find the information presented in several different interesting formats:



Summary. These brief overviews will give a big-picture understanding of the content covered in the video.



Vocabulary. This will be an introduction of possible new terms.



Review Questions. These questions will help to clarify many of the concepts presented throughout the video. Answers to the questions will be presented at the end of this study guide.



Scripture Quotes. God's Word will clarify the truth of the concepts being presented.



Quote Boxes. These quotes will demonstrate man's thinking on different subjects.



Activities. These exercises will focus will provide creative ways to reinforce the information presented.

<u>Chapter 1 – The Staggering Facts About Our Sun</u>

Please start by watching Chapter 1 of the video, then complete the following section.

(The Staggering Facts About Our Sun" Summary

Since the Sun is the central star of our solar system, it's largely responsible for signs, seasons, days, and years. The Sun puts out more energy in one second than a billion major cities would use in a year. It is more than 864,000 miles in diameter, which is about 109 times the Earth's diameter. That's 330,000 times more than the mass of



the Earth.

Angular Momentum – The measure of an objects ability to continue moving, if unobstructed, in a curved motion. It is a conserved quantity, meaning that if unobstructed it will continue to move at that same momentum indefinitely. "And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years."

Genesis 1:14

The Sun accounts for more than 99% off all the mass in the solar system, even though it only has about 1% of the angular momentum. The planets account for has been measured degrees Fahrenheit.

all rest. The Sun's temperature to be between 9,000 - 11,000

The internal temperature is on the order of 27 million degrees Fahrenheit, and that's high enough to sustain nuclear reactions, fusing hydrogen to helium – which we believe to be the source of the Sun's energy. We calculate that the Sun can shine this way for 8-10 billion years.

Layers of the Sun

The Core

We have good evidence that nuclear fusion is taking place in the core of the Sun. If this is true, we would expect the Sun to release neutrinos. Neutrinos are these little particles that can go right through ordinary matter. We have neutrino detectors on earth, un

"Why did God make such a magnificently powerful object when we only need a small fraction of it? Well, he's God, why not? It's not like it was harder for him to make, than it was to make anything else".

Dr. Jason Lisle, Christian Astrophysicist & Founder, Biblical Science Institute and have detected neutrinos coming straight from the core of the Sun. There are several trillion of them going through you every second.

Radiative Zone

The radiation from the core streams out through this region.

Convection Zone

In this region is all kinds of motion. For example, the plasma bubbles up and carries energy from the inner sections of the Sun out to the surface.

Photosphere

This is the area that we can actually see. In this zone there is lots of activity, including sunspots, which are cooler regions because of strong magnetic fields that prevent motion. This is because plasma cannot move across a line of a magnetic field. Because of this, these are cooler (about 4,000 degrees) compared to the rest of the Sun.

Chromosphere

The phrase "Chromo" means color. It's named this because when we can see it, it often appears vividly colorful, even though this thin layer is normally transparent and difficult to see. However, it becomes more visible during a solar eclipse. It's a little ring of very colorful prominences.

Corona

This is a layer of hydrogen gas that streams out into space, and can't really be seen by the naked eye. However, it can be detected by spacecraft.



"The Staggering Facts About Our Sun" Review Questions

- 1. According to Genesis 1:14, why did God create the Sun?
- 2. According to the video, how many cities could the energy of the Sun power in one second?
- 3. What is the size of the Sun's diameter?

- 4. How much of the entire solar system's mass makes-up the sun?
- 5. How much of the solar system's total angular momentum does the Sun have?
- 6. What is the internal temperature thought to be for the Sun?
- 7. According to the video, how long is it believed that the Sun could last?



Describe the following layers of the Sun:

