The Sun Full HD 1080p, Amazing Documentary

<https://www.youtube.com/watch?v=C2FETG7tCF0>

**2:13-4:55 (introduction)**

Why is the sun important? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why is studying the sun important? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How has our knowledge of the sun increased recently in history? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**4:55-5:58 (Sun facts)**

|  |  |
| --- | --- |
| Sun’s distance from Earth |  |
| Sun’s light travels |  |
| Sun’s age |  |
| Sun’s lifespan |  |
| Sun’s size |  |
| Sun’s size vs Earth size |  |
| Sun’s mass in solar system |  |
| Sun vs Earth mass |  |
| Sun’s matter is called |  |
| Sun’s gravitational pull |  |

**5:58-9:34 (Sun’s composition)**

What scientist created a model with the sun in the middle of our galaxy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What created the Sun? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Temperature of sun? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**9:35-12:35 (Eclipses and sun’s core fusion)**

SOHO is short for? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What does a coronagraph do? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Temperature of Photosphere: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Temperature of Corona: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In the Core - Nuclear fusion is when \_\_\_\_\_\_\_\_\_\_\_ fuse to create \_\_\_\_\_\_\_\_\_ and release \_\_\_\_\_\_\_.

Energy = Photons = \_\_\_\_\_\_\_\_\_\_\_\_\_

Random Walk- Photons can move around the Sun’s layers for how long? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When Photons leave the sun how long does it take for it to travel to Earth? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**12:35-15:00 (Solar surface)**

Temperature of sunspots:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sunspots emit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_light about as bright as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Differential rotation creates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sun’s rotation at equator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sun’s rotation at mid latitudes: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sun’s rotation at poles:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sunspots have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sunspots are dark because they block the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ underneath.

Sun spots pop= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are breaking = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are created

**15:00-16:33 (Sun’s Alfen waves)**

2006 space prop caught on camera \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Alfen waves travel from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the Corona

 **16:34-19:08 (Sun’s seasons and solar flares**)

Solar maximum and Solar minimum are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ called the solar cycle

Affects \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Cycle is how long: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What do scientists observe to measure the cycle? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Solar minimum has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sunspots

Solar maximum has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sunspots and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_sun flares and other solar activities.

Energy expelled from sun goes into the solar atmosphere which includes Earth

Space weather affects the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Magnetic fields are high in number during \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Solar flares are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

They occur near \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and give off as much energy as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of dynamite

Particles from a solar flare reach Earth in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**19:08-22:20 (Coronal mass expulsion)**

Massive blasts that carry \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of tons of mass into space from the Sun moving a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Halo Effect = when a cloud of energy surrounds the corona graph and the sun’s energy is aimed at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What happened to SOHO camera during the coronal mass expulsion? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Why are astronauts at higher danger? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Particles hit Earth’s magnetic field and create currents of energy. Problems on Earth include

1. 2.

**22:21-24:40 (1859 Super flare)**

Seen with the naked eye which means what? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Prior to this event scientists didn’t know flares existed.

If this flare happened today: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

How many people would lose power? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

For how long? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Cost would be? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

STERO are what? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What does STERO probes allow scientists to do? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**24:40-26:09 (Solar minimum)**

2008 was the fewest sunspots with how many sunspot free days?

1650-1715 only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sunspots instead of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sunspots

Europe experienced a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and temperatures \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Can scientists know right now if this current minimum will have a big impact on Earth?

**26:10-29:20 (GRB- Gamma Ray Blast)**

Earth can have life survive because of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Without the ozone layer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ would penetrate through and life on Earth would \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are intense break flashes of gamma ray radiation

GRB could destroy the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In seconds GRB give off as much energy as the sun emits in its\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GRB are created by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

GRB occur \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ per day and most are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of light-years away.

WR104 are two stars spinning around each other what might happen? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

WR104 GRB would deplete \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of Earth’s ozone layer.

Ancient GRB causes ancient\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ extinction.

**29:22-32:05 (Solar wind decreasing)**

20% decrease in Sun’s solar winds over the past few decades.

Solar wind is the steady emission of particles from the sun. Solar wind continues past \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Solar wind move as fast as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Solar wind forms a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ around our solar system from intergalactic particles.

Solar wind has become weaker so this means more high energy electrons can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and have increased by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Earth has 2 types of shields:

1. 2.

If theWR104 emits a GRB then these could disappear.

**32:05-38:00 (Fossil fuels)**

Earth is in the goldilocks’ position which means what? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Sun helps Earth by:

1. 2. 3.

The sun is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of Earth.

Sun is the source of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fuels because Trees, animals , etc. all get energy and then die and are squeezed/compressed and turned into fossil fuels.

If humans burn all the fossil fuels we change the Earth’s atmosphere.

Greenhouse effect is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

It keeps the Earth \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Without it the oceans would \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

However, too much greenhouse is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Too much water vapor, methane and carbon dioxide in the atmosphere - gases trap the Sun’s radiation- elevate the Earth’s temperature and lead to global warming which can melt the polar ice caps and lead to a rise in ocean levels if it happens to quickly.

Draw a model of good greenhouse Draw a model of bad greenhouse

Too much ancient fossil fuel gases being burned would allow \_\_\_\_\_\_\_\_ of Sun’s radiation to enter Earth’s atmosphere.

Vitamin D protects us by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ however too much sun would cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Solar technology called solar cells could help by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Two current ways to trap solar energy:

1.

2.

In new \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ technology scientists are using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because of peptide (molecule). When peptide is exposed to sunlight it will circulate electrons which create \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 **38:01-43:00 (Suns’ Death)**

Elements that make up the sun, Earth, etc. all come from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ years the Sun will have burned through all H and then He.

The Sun will start to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_ will take the Sun’s outer layers to float away.

What will remain n the contracting Core of the Sun with no nuclear reactions occurring. It will slowly fade over time.

Our Sun will not create a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ but instead will be a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ star.

It will be about the size of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and will be like a rock getting \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_ over time.

All planets will be affected.

As the Sun expands as it dies, Earth’s surface will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and water will \_\_\_\_\_\_\_\_\_\_\_ and oceans will \_\_\_\_\_\_\_\_\_\_\_\_\_. Life will not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Scientists believe in billions of years technology that will exist will allow us to:

1.

2.

Our Sun’s stardust will become the matter to make \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Earth’s matter along with the Sun’s and all other planets will all become other forms.

 \_\_\_\_\_\_\_\_\_\_\_\_\_ in cells. \_\_\_\_\_\_\_\_\_\_\_you breathe. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in bones. \_\_\_\_\_\_\_\_\_\_\_\_\_\_in red blood cells

All elements created inside \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Because stars \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = life is possible.