

Review: Stellar Astronomy

Earth Science

Name: _____

Date: _____ Hr: _____

1. Outline the VISIBLE LIGHT spectrum (include change in wavelength, frequency, and temperature)

Summarize how wavelength (λ) relates to wave frequency:

Summarize how wave frequency relates to star temperature:

2. What does it mean that "a star's spectrum is like its fingerprint"?

Identify the dominant gases most stars are composed of.

3. The spectrum for the element Helium is shown here.



If Helium was found in a blue shifting star, what would its spectrum look like? Red shifting star?

Blue Shifting

Red Shifting

4. Define (in your own words) parallax:

Describe how astronomers use parallax to determine if a star is closer than another to Earth.



5. Describe the numbering system used for star magnitude:

Explain how can a star have a different absolute magnitude than its apparent magnitude?

6. Complete the chart below comparing the 2 main types of telescopes

Telescope	Design (main parts)	Advantages	Disadvantages
Refractor			
Reflector			

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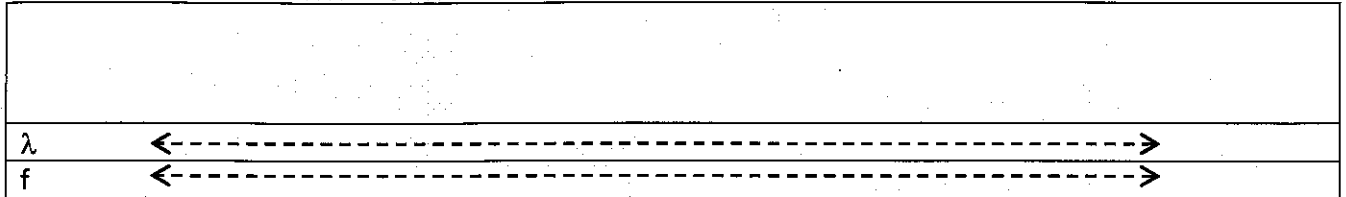
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7. Describe 3 challenges astronomers face when using normal optical (visible light) astronomy.

-
-
-

8. Diagram the electromagnetic (EM) spectrum from LONGEST to SHORTEST wavelength (include the 7 sections plus how wavelength and frequency change along the spectrum).



9. Explain why only **visible light** and **radio waves** reach Earth's surface.

10. Describe how a radio telescope produces false-color images.



11. OUR SUN

- Describe the process that occurs in the Sun's **core** + 2 conditions causing this process.
- Describe the process occurring in the Sun's **radiative zone** + how photon energy behaves.
- Describe the process within the Sun's **convective zone** + what this causes at the photosphere.
- Describe physical characteristics of the **photosphere**.
- Explain the connection between extreme solar storms and auroras in Earth's atmosphere.
- Describe what the sunspot cycle graph shows us.

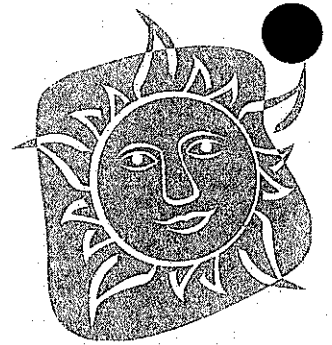
Secrets of the Sun

Earth Science

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Answer these questions while watching The Universe: Secrets of the Sun
You can also find the video linked from our class webpage!



INTRO

1. Explain why our Sun is classified as a "yellow dwarf" star.

CORE

2. Describe the process of **nuclear fusion** discovered during the 1920's.

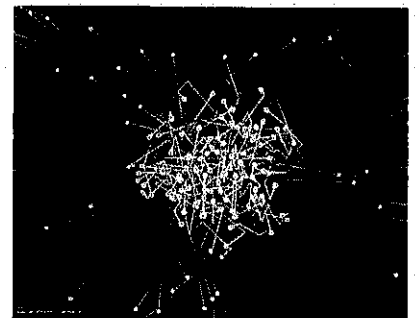
3. In the animation of the Sun's core, the small blue spheres represent _____ atoms, the red spheres represent _____ atoms, and the glowing spheres represent _____ created as a by-product of fusion.

4. What causes these hydrogen atoms to fuse together?

RADIATIVE ZONE

5. Describe a photon and what its "job" is:

6. Describe the process of the "random walk" of photons.



CONVECTIVE ZONE

7. After leaving the radiative zone, how is the radiation carried outward.

8. Describe what makes Earth a "privileged place to live"? (hint: think Goldilocks)

9. What force drives storms on the Sun? _____

How do we know that magnetic field lines exist on the Sun?

10. What causes sunspots to look dark?

SOLAR STORMS

11. Describe problems Coronal Mass Ejections and other solar activity cause on Earth.

Tracking Sunspots

Earth Science

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- Plot Table 1 data on the graph below and draw a line connecting your data points.
- Find 3 consecutive years where your sunspot graph PEAKS:
_____, _____, and _____.
- The sunspot cycle peaks approximately every _____ years.
- Study the cyclical pattern and predict the # of sunspots for the following years:
 - 2016 _____
 - 2018 _____
 - 2020 _____
 - 2022 _____

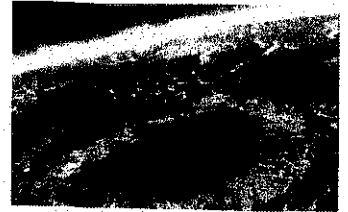


Table 1: Sunspots recorded from 1954-2014

Year	Sunspots	Year	Sunspots	Year	Sunspots	Year	Sunspots
1954	3	1970	107	1986	11	2002	109
1956	126	1972	67	1988	101	2004	43
1958	172	1974	32	1990	145	2006	15
1960	102	1976	12	1992	94	2008	2
1962	30	1978	86	1994	31	2010	14
1964	7	1980	149	1996	8	2012	58
1966	39	1982	115	1998	62	2014	113
1968	98	1984	44	2000	123	2016	?????

Annual Sunspots (1954-2024)

