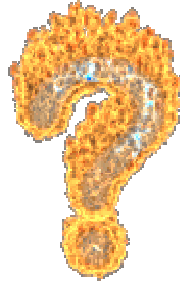


The Day the Earth Caught Fire



1. Was the eclipse of the Sun that occurs in the film an expected event?
 - a. What causes an eclipse of the Sun?
+
+
 - + b. Can an eclipse of the Sun be calculated far in advance?
 - c. What does it mean if an eclipse occurs at a time different from the calculated time?
+
+
2. How does the video explain the occurrence of the heat mist?
+
+
 - + a. Is it plausible that a four stroy heat mist could cover one-third of the globe for the reasons they give in the movie.
3. The video shows a cyclone. What do Americans call a cyclone?
 - a. What produces a cyclone?
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+
+
 - b. Can a heat mist produce a cyclone?
4. The video states that the Earth has changed it's axis of rotation in the past. This is an incorrect statement. How could scientists infer that such a change has occurred?
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+
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+
 - a. The Earth's magnetic field has changed polarity many times during the history of the planet. These changes are inferred from studying the magnetixm of particles that are froze into rock forms at different times in the Earth's history. Iron particles in molten lava beds aligned themselves according to the magnetic field at the Earth's surface at the time these rocks solidified. How is this different from the change of the physical rotation of the Earth about it's axis? (Can you see how nonscientist types can get these two concepts mixed up).
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+
+
5. How hot does it get by the end of the movie?
 - a. At what temperature is the Human Body?
 - b. What causes heat stroke?
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+
+

c. What temperature do you believe society would cease to function?
d. What would the long period of elevated temperatures have done to the food chain on which humans depend?

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+

e. Would the combination of the heat expansion and ice melting of water likely submerge England?

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6. The cause of all this trouble is the explosion of two simultaneous hydrogen bombs, pushing the Earth toward the Sun. Let's see if this is plausible.

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Mass of the earth = 6×10^{24} Kg = 6.6×10^{22} Tons

The largest hydrogen bomb exploded to date released mass (energy) of 68 million tons of TNT

+

For the Earth to be moved toward the Sun, some of the matter would have to be propelled in the direction away from the Sun, (Due to the Conservation of Momentum), at sufficient speed to escape the Earth's gravitational pull. This is an escape velocity of 25,000 mph. Let us assume that the hydrogen bomb propelled its mass at escape velocity.

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Use the Cons. of Mom. to calculate the final velocity of the Earth.

$(M+m)v' = Mv + mV$ Assume $v'=0$; M = Earth Mass;

m = debris mass; V = debris velocity; and v = final earth velocity.

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a. Multiply your answer above by 8,800 hrs/yr. to reveal how much closer the Earth would be in one year.

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b. Change your answer from miles to inches.

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+

c. How does this compare with the 93 million miles the Earth is from the Sun?

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+

d. Is it possible that the explosions cause the change in weather in the movie?

e. Let's increase the explosive power to equal the biggest explosions on earth caused by volcanoes. Calculate the earth's final velocity from Krakatoa's explosion in 1883. 26 times the explosive power as the largest hydrogen bomb. (This threw debris 34 miles into the air and heard 1/13 the surface of the entire Earth)

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f. Probably the greatest explosion in recorded history blew the island of Thera, near Crete, to pieces in 1500 B.C. Guinness estimates that the volcanic explosion was 5 times larger than Krakatoa. Calculate the earth's final velocity.

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g. (Note: We're assuming that the earth is not spinning or revolving around the sun for these calculations.) Will the initial speeds of the earth affect the above results?

+

+

7. Even if the world was saved by the counterexplosions, would there likely have been so much dirt thrown into the atmosphere that a "nuclear winter" would result?

+

a. Do you think the counterexplosions would enable the humans to survive?