Fact vs. Fiction in "The Core"

Pacemakers would not be affected that severely by EMR. If they were, people would die from them during solar flares and anytime they came in contact with high pulses of EMR.

Some birds do use magnetic fields to navigate, but we do not understand yet how they do it. Even if the Earth's magnetic fields disappeared, it wouldn't cause the birds to become blind and run into buildings and other objects. Even when birds do hit glass, it rarely breaks the glass – if it did, skyscrapers couldn't have all those glass windows, or they would be replacing windows every day!

When the Space Shuttle re-enters the atmosphere, it has about 20-25 minutes before it lands, not 3 minutes. It *is* a glider though and cannot simply fly elsewhere to land.

The Space Shuttle cannot maneuver that quickly. Also, no sonic boom would be heard while the shuttle is flying at a low altitude, because the atmosphere is too thick at low altitudes for the shuttle to move faster than sound. An object must be moving faster than the speed of sound to make a sonic boom ('break the sound barrier'.)

Cosmic waves are deflected by earth's magnetic field, and can interfere with electronics and cause auroras. Microwaves are not actually deflected by earth's magnetic field because they are not charged particles. Microwaves could 'cook' the planet since they do heat things up like metal and foods. However, very few microwaves reach the Earth since the Sun only emits a small amount of microwave radiation.

If the magnetic field did stop (it won't) it would not stop planes from flying, it would not cause major lightning storms and it would not cook the Earth. To stop Earth's magnetic field, the core does not need to completely stop spinning and it is highly unlikely that anything could cause the core to stop spinning. However, if the spin became chaotic, the magnetic field could be disrupted. In fact, Earth's magnetic field changes its direction every 700,000 years or so (any day now.)

"Unobtainium" is supposedly made from tungsten and titanium, yet it was given a name that indicated that it is an element. Compounds are not elements!

The Marianas Trench is not where the thinnest crust is – but it is the deepest place on the ocean floor.

Earthquakes underwater would be barely noticeable to a ship above it.

Ocean currents are not whirlpools underwater.

If the navigation system can see through lead, why can't it see through gas? It doesn't make sense.

The 800,000 lbs/square inch of pressure would have prevented a gas bubble from forming, so a geode is impossible at that depth. If the bodysuits can withstand that pressure, though, how does a falling rock get through his helmet?

The human body is less dense than water and water is less dense than magma. When someone dies and falls into lava they will *not* sink. A human body would float on magma until it melts or burns up.

Microwaves don't melt metal.

Waves will amplify when combined properly, but that doesn't increase the amount of energy released.

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Study Guide for the Movie "The Core"

Directions: Answer the following questions as you watch the movie or afterwards.

1. At what time did the man's watch stop?

2. List at least two things that happened right around that time.

3. Where does the professor, Dr. Joshua Keys, work?

4. Look at the board in the university classroom. What's missing or not labeled on the drawing?

5. What does an Oscilloscope measure?

6. What does he mean when he states: "The waves can tell us about the fundamental architecture of our planet?"

7. What does the demo with the stones and the trumpet have to do with earthquakes?

8. What does Serge and Dr. Keys think caused all the deaths?

9. What did every person who died at 10:30 AM have in common?

10. How do birds navigate over long distances?

11. Why does the shuttle look like it is burning up as it moves through the atmosphere?

12. What happened in mission control just before the Space Shuttle Endeavor was supposed to land?

13. When the shuttle reappeared on radar, what was the problem?

14. What is the bad news that Dr. Keys and Dr. Zimsky have to give the government officials?

15. What does the Earth's magnetic field protect us from?

16. The Earth's rotating core and magnetic field gives us our _____ north and south poles.

17. Listen to his description of the planet using the peach. Was it correct? Explain

18. Describe the two parts of the Earth's core.

    a. Inner Core –

    b. Outer Core –

19. Why is the Earth's magnetic field collapsing?

20. According to Dr. Keys, what are some of the consequences of the magnetic field collapsing?

    a. _____ will start falling from the sky.

    b. Hundreds of _____ _____ will be released by super magnetic storms.

    c. All electronics will be _____.

    d. _____ radiation will come in and 'cook' our planet.

21. How could the magnetic field be repaired?

22. Why does Dr. Keys think that doing this repair is impossible?

23. Dr. Keyes tells the General the core is the size of Mars. Is he correct? Explain.

24. In the Salt Flats of Utah, Dr. Braselton has been working on a "legendary ship" that uses _____ waves to bore a smooth hole through solid rock.

25. The matrix Dr. Braselton used to make his ship out of was made from the elements tungsten and titanium. What name did he give this alloy he created?

26. The material the ship is made of can take heat and pressure and convert it into energy to _____ the shielding material.

27. What job is assigned to Theodore Brad Finch, "Mr. Rat"? Why?

28. Instead of astronauts, what will the crew of this ship be called? Why is this an appropriate name?

29. Dr. Zimsky calculated that an explosive charge of 1000 megatons is exactly the amount needed to restart the core. If the charge is too great the core would be destabilized. What could cause Zimsky's estimate of the amount of power needed to restart the core to be completely wrong?

30. He also said that science is just a “best guess.” What does he mean?

31. What do YOU think this quote means: “Being a leader is not about ability, it’s about responsibility…. You’re not really a leader until you’ve lost.”

32. What sort of animal was swimming around the ship? Why?

33. The scientists decided to launch their ship into the Marianas Trench.

    a. What is the advantage of launching there?

    b. What is the risk of launching there?

34. What unexpected event threatened to stop the mission before the ship even entered the earth?

35. What does the ship use to break through the crust?

36. The woman pilot says, “We’re about to make the transition into the mantle What is the real name for that location?

37. Anything the ship cannot pass through is shown as _____ on the navigation screen.

38. What does static on the navigation screen mean?

39. What does the ship get stuck on?

40. The crew goes outside to get themselves unstuck. What do they describe their location as being like?

41. What are the crew’s suits designed to protect them from? Does this seem realistic based on the construction of the suits?

42. Why are the crystals in the lower mantle so huge?

43. What observation led the crew to realize the outer core was much less dense than expected?

44. What major problem does this lower density pose for the mission?

45. When the microwaves got through the atmosphere over San Francisco, what damage did they cause? List at least two (2) consequences.

    a. b.

46. How does the crew decide it can compensate for the lower density of the outer core so they can still restart the spinning with the bombs they have? Be specific.

47. Why does someone need to go into the 9000° crawl space? What will happen to them there?

48. Dr. Zimsky messed up his calculation *again*. How can they correct for this with only one bomb left?

49. What is scientifically incorrect about this statement: "They found a space between tectonic plates near Hawaii."?

50. How does the ship get back up to the ocean floor?

51. Why does the ship stop moving as soon as it reaches the ocean floor?

52. How is the ship finally located?

Calculation: The crew expected to make it through the crust in 15 minutes, travel 24 hours through the mantle and then 15 hours through the outer core until they reach the inner core/outer core boundary. Based on these estimates, what is their expected average speed through each layer?

Use the formula **speed = distance / time** and the ESRT to answer the following questions. Show your work, include units and round your answers to the nearest tenth.

a. How thick is the crust? _____

b. Calculate speed through the crust _____

c. How thick is the mantle? _____

d. Calculate speed through the mantle _____

e. How thick is the outer core? _____

f. Calculate speed through the outer core _____