Planetary Geology: Earth and the Other Terrestrial Worlds
Which two bodies show evidence of heavy cratering?

a) Mercury and Venus
b) Mercury and Earth
c) Mercury and Earth's Moon
d) Earth and Venus
e) Earth and Mars
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Which two bodies show evidence of liquid water?

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How do we learn about Earth's core, mantle, and crust?

a) deep drilling
b) seismic waves
c) X-ray imaging
d) all of the above
e) A and B
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The inside of Earth is filled with molten lava

a) true
b) false
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a) true
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How do we know that Earth is geologically active?

a) volcanoes  
b) seismology  
c) measurements of internal temperature  
d) all of the above  
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What is the *lithosphere*?

a) another name for a planet's crust
b) the crust plus the mantle
c) a relatively rigid outer layer of rock that floats on molten rock below
d) the boundary between the core and mantle
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Where did Earth's (interior) heat come from?

a) volcanoes
b) impacts as Earth was accreting
c) radioactivity
d) all of the above
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How does an object's rate of cooling vary with size?

a) A larger object cools more slowly than a smaller object.
b) A smaller object cools more slowly than a larger object.
c) Size has no effect on an object's rate of cooling.
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What is necessary for differentiation to occur in a planet?

a) It must be made of metal and rock.
b) It must be made of a mix of materials of different density.
c) Material inside must be able to flow.
d) all of the above
e) B and C
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Do you think *differentiation* is likely to happen in a very small planet?

a) yes
b) no
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What is the source of Earth's magnetic field?

a) magnetic rocks  
b) magnetized iron in Earth's crust  
c) magnetized iron in Earth's core  
d) molten metal circulating inside Earth
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Why are smaller terrestrial bodies such as Mercury or the Moon "geologically dead"?

a) They don't have volcanoes.
b) They cooled off faster than Earth did.
c) They don't have erosion.
d) They were hit by fewer meteorites than Earth.
e) They are made of different materials than Earth.
Why are smaller terrestrial bodies such as Mercury or the Moon "geologically dead"?

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Do you think seismology would work on the Moon?

a) No, because there is no water or air.
b) No, because the Moon is geologically dead.
c) Yes.
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Which of the following is an example of *convection*?

a) Heat radiates from a planet into space.
b) Heat travels from atom to atom from inside a planet to the outside.
c) Hot material inside a planet rises, and cool material sinks towards the center.
d) Metal conducts energy throughout Earth's core.
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What is true of convection that stresses a planet's crust?

a) Mountains may form where the crust is pushed together.
b) Cracks and valleys may form where the crust is pulled apart.
c) Convection has no effect on a planet's crust.
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What are the 4 basic processes that shape planetary surfaces?

a) magnetic fields, impacts, volcanoes, erosion
b) magnetic fields, earthquakes, volcanoes, erosion
c) tectonics, impacts, volcanoes, erosion
d) magnetic fields, impacts, volcanoes, erosion
e) tectonics, impacts, erosion, magnetic fields
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The lunar crater *Tycho* is about 80 km (50 miles) across. It was probably made by

a) the eruption of the large volcano in its center.
b) an impactor about 80 km across.
c) an impactor about 8 km across.
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Why do the *lunar highlands* have many more craters than the *lunar maria*?

a) They are on the side of the Moon away from Earth, which was hit by more impacts.
b) Lava flooded the maria, hiding many craters.
c) The less cratered surfaces are younger than those with more craters.
d) all of the above
e) B and C
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What seems to have made the very long cliffs on Mercury?

a) volcanoes
b) earthquakes
c) cooling and shrinking when the planet became geologically dead
d) meteorite impacts
Chapter 9

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Why do we think Mars had more volcanic activity in the past than it does today?

a) Mars was bombarded with more impacts in the past, which fueled more volcanic activity.
b) Mars would have been warmer in the past.
c) Some meteorites from Mars come from relatively young lava.
d) all of the above
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What evidence is there for past liquid water is on Mars?

a) channels that look like dry riverbeds
b) eroded crater rims and erased craters
c) *Spirit* and *Opportunity* rovers have found mineral evidence of water
d) ice in Mar's polar caps
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a) we presume it has active volcanoes.
b) we observe it with radar.
c) we observe it with landers.
d) all of the above
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The interior of Earth consists of

a) a metallic core and solid rock outer shell.
b) a rocky core and metallic outer shell.
c) a metallic core and liquid rock outer shell.
d) a liquid rocky inner core and solid rock outer shell.
e) a mixture of rock and metals throughout.
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Suppose Venus rotated as fast as Earth. How would this change its relative levels of volcanism, tectonics, and erosion?

a) All would remain the same – they are independent of rotation.
b) All three would be higher.
c) All three would be lower.
d) Levels of volcanism and tectonics would stay the same, but erosion levels would be higher.
e) Levels of volcanism and tectonics would be higher, and erosion levels would stay the same.
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Should we land on Mars and search for life?

a) Yes, if we found evidence of life it would have important scientific implications.

b) Yes, if we found evidence of life it would have major scientific, philosophical, and religious implications.

c) No, it's too expensive.

d) No, at best we're likely to find fossils, and they aren't interesting.
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