

Geologic maps and cross-sections are constructed from field measurements and rock-type observations to help understand patterns and provide basis for filling in gaps in observations and areas where rocks cannot be measured or have disappeared via erosion.

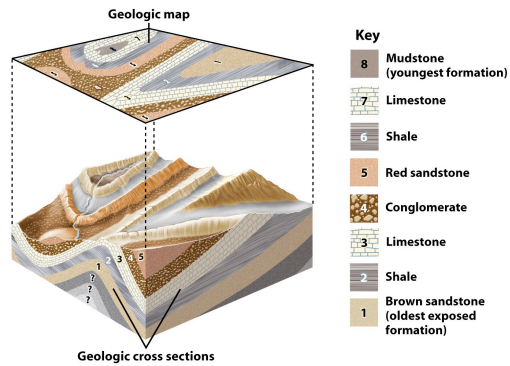


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This sample was compressed under conditions representative of the shallow crust. The fracture indicates that the marble is brittle at the laboratory equivalent of shallow depth.

This sample was compressed under conditions representative of the deeper crust. It has deformed smoothly, indicating that marble is ductile at greater depth.

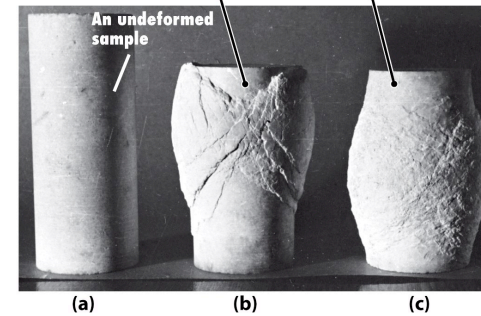


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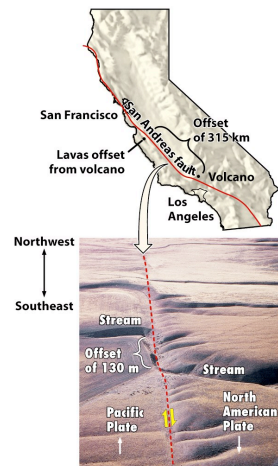
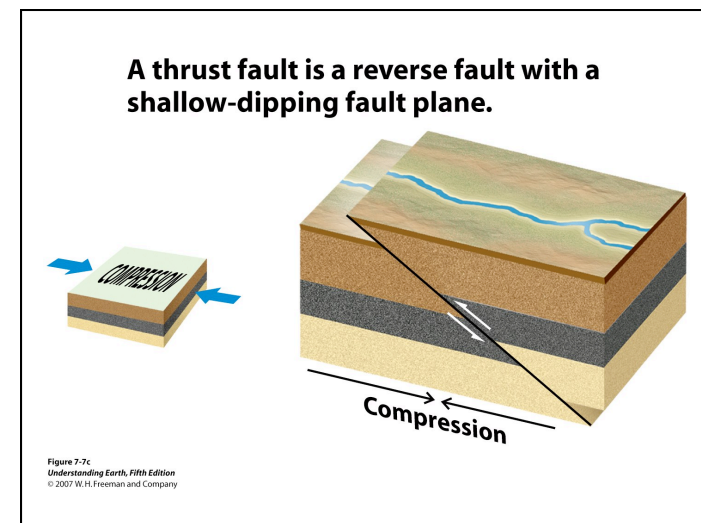
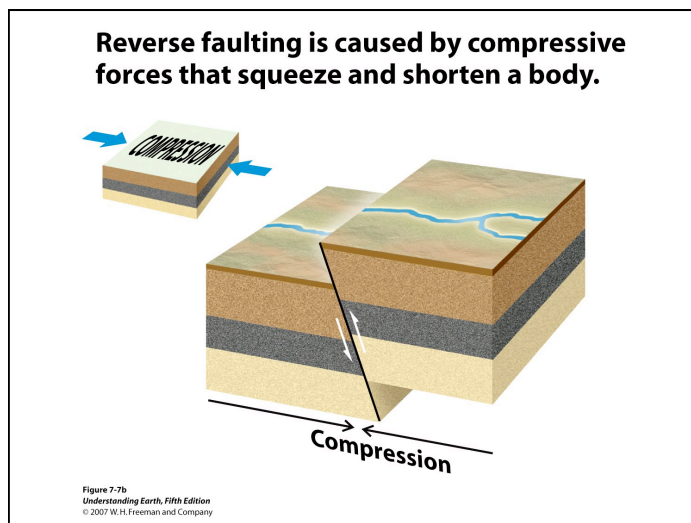
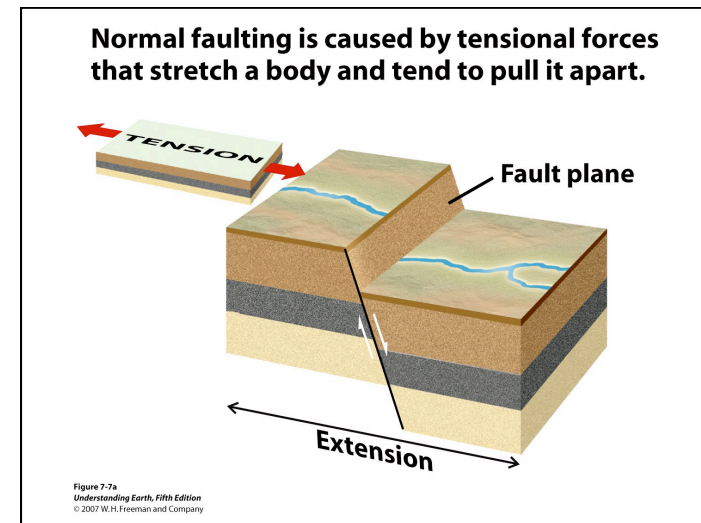
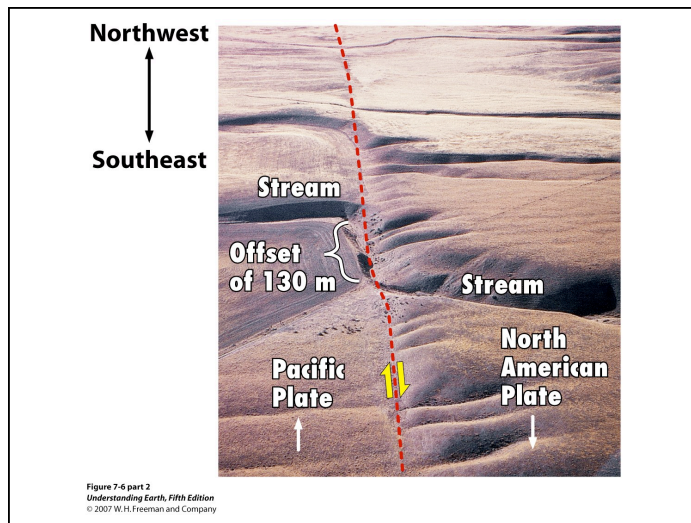


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Strike-slip faulting is caused by horizontal shearing forces that shear the body left-laterally or right-laterally.

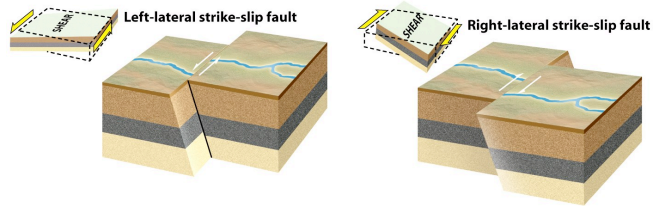


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Oblique-slip faulting is caused by a combination of forces, in this case left-lateral shearing with tension.

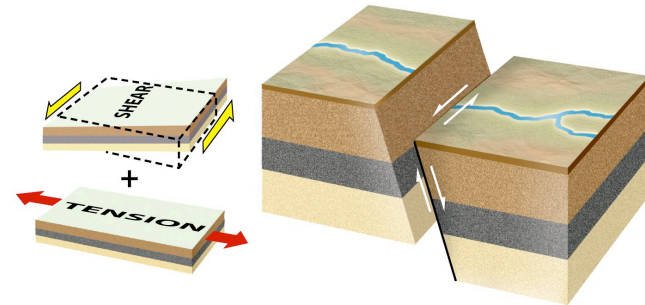


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Surface fault scarp formed during 1954 Dixie Valley, Nevada extensional earthquake



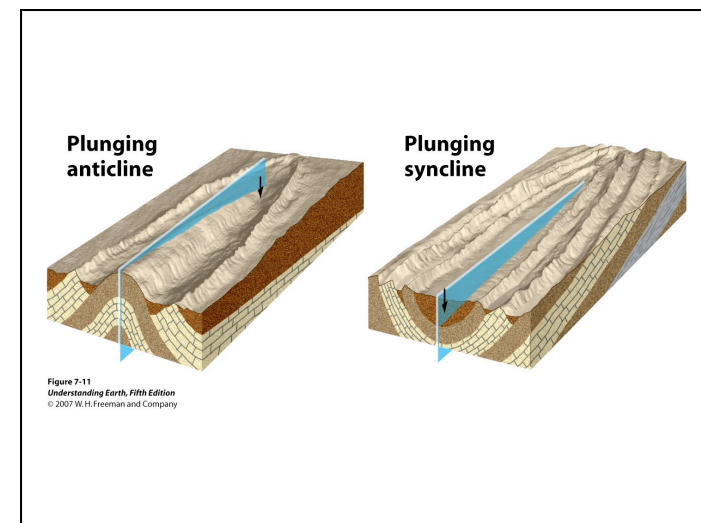
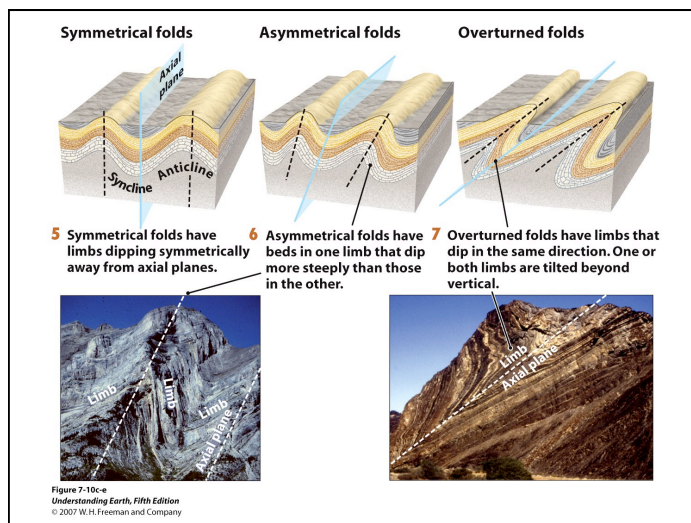
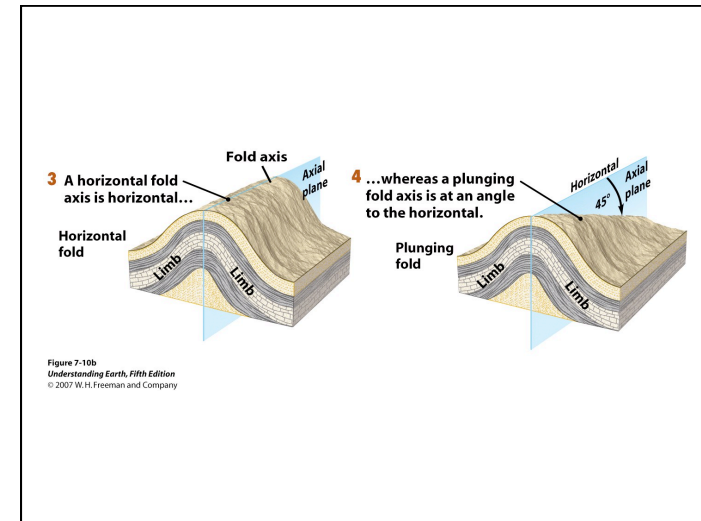
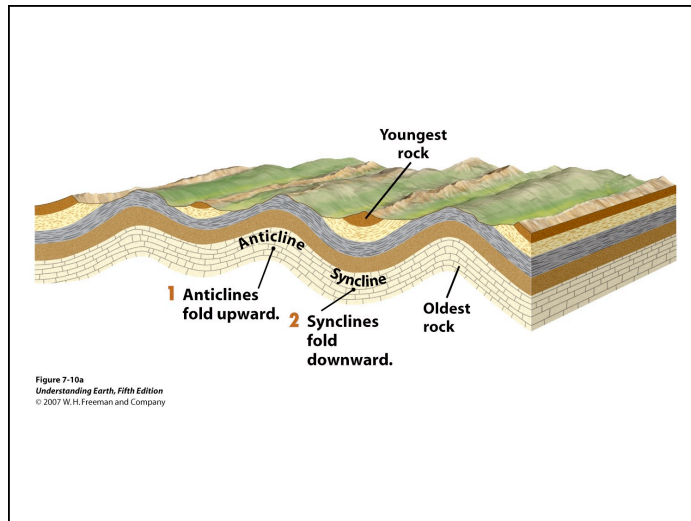
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*Folding – small-scale (below) to large-scale*



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Sheep Mountain anticline and exposed but eroded fold limbs, Wyoming

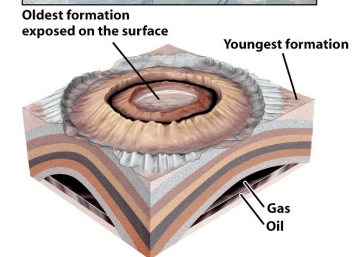
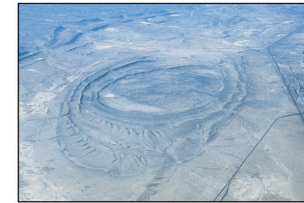


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### Rock joints

-No slip across a joint

- regional stress can cause regular "breaks" or jointing

-Expansion of deeply buried rocks unloaded by erosion of overlying layers

-Key pathway for groundwater & focus of hydrothermal deposition



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Jointing in strata at Arches National Park



**1 Tensional tectonics:** Extension of continental crust occurs on normal faults having high dip angles in upper crust that flatten with depth, forming curved fault surfaces.

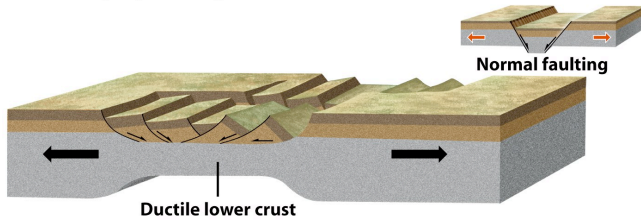


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**2 Compressive tectonics:** Compression of continental crust occurs on thrust faults with low dip angles.

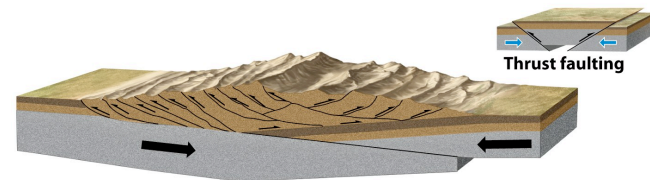


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**3 Shearing tectonics:** Shearing of continental crust occurs on a nearly vertical strike-slip fault. The case shown here is for a right-lateral fault.

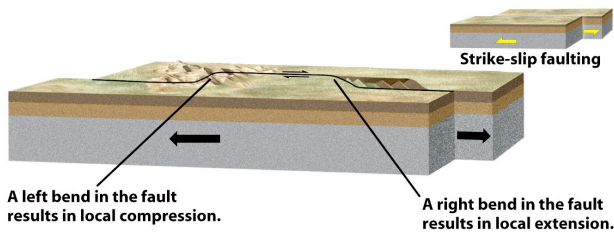


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Keystone thrust fault, southern Nevada

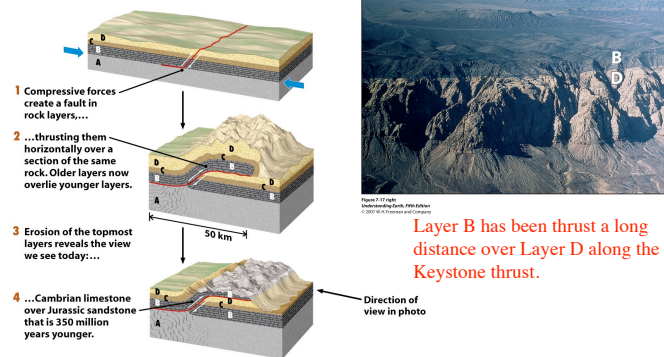
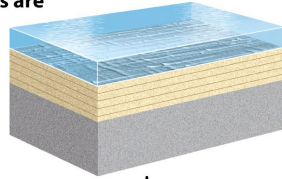


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**TIME 1**  
Horizontally stratified sediments are deposited on the seafloor.



**TIME 2**  
Compressive forces cause folding and faulting.

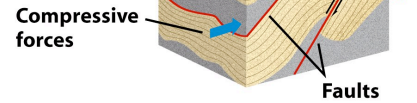
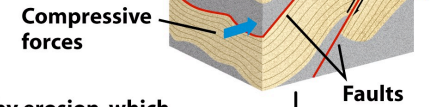


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**TIME 2**  
Compressive forces cause folding and faulting.



**TIME 3**  
Uplift is followed by erosion, which creates a new horizontal surface.

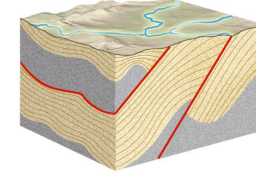
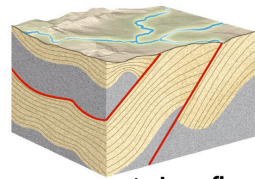


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**TIME 3**  
Uplift is followed by erosion, which creates a new horizontal surface.



**TIME 4**  
Volcanic eruptions flood the new surface with lava sheets.

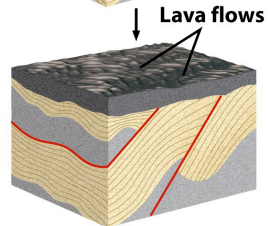
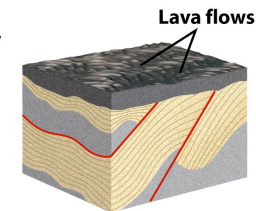


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**TIME 4**  
Volcanic eruptions flood the new surface with lava sheets.



**TIME 5**  
Tensional forces cause normal faults, creating downfaulted blocks and breaking up earlier features.



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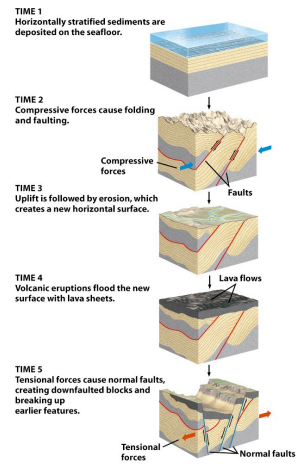


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