1. Why do some rock layers fold and others break into faults when they are subjected to crustal forces?

Experimentation indicates that rocks subjected to low confining pressures and low temperatures, such as exist near Earth's surface, will tend to break under deforming pressure. Rocks subjected to conditions that simulate those deep below the surface will bend or fold when a similar force is applied.

2. If you found tilted beds in the field, how would you tell if they were part of an anticline or a syncline?

One could not usually make a determination at the site but would need to look for other outcrops of the same rocks in the surrounding area. If the outcrops define a strip of rocks that becomes older as one progresses toward its center, it is an eroded anticline. If the rocks become younger toward the center of the feature, it is an eroded syncline.

3. Evidence for vertical crustal movements is often found in the geologic record. Give some examples of such evidence.

Areas that are lifted above the surrounding terrain are targets for increased erosion. Thus, the extensive erosion of such areas as the Black Hills is evidence that the area has been lifted. The tilt in adjacent sedimentary beds that were revealed by erosion indicates uplift as well.

4. It has been suggested that the Himalaya Mountains and the Tibetan Plateau were uplifted ~2,000 m about 10 million years ago. What caused this sudden uplift?

Mountains are pushed up when the continental lithosphere is compressed – in the process, both the crustal and mantle parts of the lithosphere are thickened, creating a deep root beneath the mountains. The mantle portion of the root is denser than the underlying asthenosphere and eventually drops off, allowing the mountains to rise higher.