

Name: _____

Date: _____

INSTRUCTIONS: Write the slide number on the line next to its matching description.

- | | |
|-----------|---|
| 1) _____ | D and H are igneous intrusions. Below L the strata are tilted. L is an unconformity. A is the <u>youngest sedimentary rock layer</u> . D caused C to fold. |
| 2) _____ | The strata below the surface are still in their original horizontal orientation, but the <u>surface was eroded at an angle creating a downward slope on the surface</u> . |
| 3) _____ | First, the strata formed in horizontal layers (B). Then, folding happened (F). Then faulting happened from an earthquake (C). Then erosion happened at the surface and a layer of sandstone was deposited (D). Then lava rose up creating a volcano (E). Finally, the surface was eroded again, the volcano was almost completely eroded away, and a valley formed (A). |
| 4) _____ | E is a massive igneous intrusion. Q is a fault line caused by an earthquake in the past. Y and W are unconformities. F,X,D,C, and B were tilted before A formed. |
| 5) _____ | Shale, sandstone, shale, and limestone were originally deposited in horizontal strata under water. The collision of continents caused them to fold. The sandstone is porous, so water filled up its pores. Oil rose up to float on the water due to its lower density. Very low density natural gas bubbled out of the oil and rose up above the oil. The shale above it is impermeable, so the natural gas got trapped between the oil and the shale, within the pores of the sandstone. |
| 6) _____ | The dolostone on top is a very hard, resistant rock layer. It is not eroded easily. This allowed the waterfall to form here. If it was softer, like the shale layers, it would have been eroded away long ago. |
| 7) _____ | Since basalt is an extrusive igneous rock, and it flowed up and over the surface here, it is an igneous extrusion, not an intrusion. The earthquake fault line cuts across everything, so it is the youngest/most recent. There are two unconformities (buried erosional surfaces). One is above the shale. The other is above the limestone. Point A is a contact metamorphic rock that used to be limestone. |
| 8) _____ | A fault line separates the shale layers from the limestone. The much older Precambrian rocks were thrust up and over the much younger Late Cretaceous strata. |
| 9) _____ | A, B, and C are igneous intrusions. They all formed some time after G and F formed. G and F were tilted and faulted. The rocks beneath D were once uplifted out of the water where they were eroded away. They later submerged back under water where D, E, and H were deposited in horizontal strata. C cuts across everything, so it is the youngest rock here. B is younger than A, G, and F, since it cuts across them. A is <u>only younger than G and F</u> . |
| 10) _____ | Sandstone is the youngest layer. A fault, also known as a transform fault, occurred after the formation of these three strata. |
| 11) _____ | B and C are igneous intrusions, but C is older since B cuts across it. Intrusion B never rose higher than layer A. The surface was eroded and a valley was created. |
| 12) _____ | An igneous intrusion caused strata to bend upwards. The ridges that formed from the more resistant conglomerate and sandstone strata rise high above the softer, less-resistant layers that eroded away between them. |

- 13) _____ The igneous intrusion formed as magma rose up from deep within the Earth. Not only did it flow upwards, but it also flowed horizontally forming "sills" between strata, as well as flowing diagonally at the "dike." The conglomerate is the oldest, and the sandstone at the top is the youngest.
- 14) _____ The lava flow is an extrusion since the lava flowed onto the surface. Contact metamorphism happened at the baked zone.
- 15) _____ Over millions of years, the horizontal strata of a plateau were eroded to leave behind a plain with more resistant "buttes" rising above the surface. The strata remained horizontal underground.
- 16) _____ The fault line that runs through the metamorphic rock happened before the sedimentary rocks formed. Boundary X is an unconformity. The irregular surface shows that the rocks were uplifted out of the water and erosion occurred.
- 17) _____ Shale and sandstone strata were folded. The surface was later eroded, leaving behind long, straight, parallel ridges and valleys.
- 18) _____ The intrusion happened before the shale. There is contact metamorphism beneath the basalt, but not above it, indicating that it is an igneous extrusion, not an intrusion.
- 19) _____ H is a fault line. A is an igneous intrusion. F is the youngest rock layer. Besides F, the other rock layers were tilted.
- 20) _____ N happened before M because M cuts across N. N and O are fault lines. L and M are igneous intrusions. K is the oldest.
- 21) _____ Sandstone, conglomerate, shale, and limestone were deposited under water. They were later folded up and out of the water, where erosion removed some of the rock material. The remaining rocks submerged back under water where limestone and shale were later deposited. All of it was then uplifted, and erosion occurred at the surface.
- 22) _____ One is an intrusion. One is an extrusion. The one that has contact metamorphism all around the igneous rock is the intrusion. The extrusion formed when lava rose up and poured over the shale, before the sandstone was even there. The sandstone was deposited last on top of the cooled and solidified extrusion.
- 23) _____ The shale is older than the sandstone. The sandstone is the youngest layer. The rocks to the right of the fault line moved upwards, against the force of gravity.
- 24) _____ B, C, D, and E formed under water as horizontal strata of sedimentary rock. Magma (A) rose up from deep underground and travelled through B, C, and part of D, so A is younger than B, C, and D. We can't be sure if A is younger or older than E. E could have been deposited before or after A rose up.
- 25) _____ Magma rose up in the center causing the sandstone, shale, sandstone, limestone, shale, and limestone strata to tilt upwards. The surface was later unevenly eroded. The most resistant rocks make up the circular ridges with circular valleys between them.
- 26) _____ Sandstone, limestone, and shale were deposited under water in that order. Later, an earthquake occurred causing rocks to the right of the fault line to rise upwards, forming mountains on the surface.

- 27) _____ The limestone was folded long ago. A granite intrusion rose up through it. The limestone and granite were eroded away above water. The shale and sandstone were deposited underwater in horizontal strata on top of the limestone and granite. The basalt extrusion flowed up across everything. The surface was eroded above water.
- 28) _____ Limestone, shale, and sandstone were deposited under water in that order. They were later uplifted out of the water where the surface was eroded and a forest could grow.
- 29) _____ The sandstone is missing from the outcrop to the right because the shale, limestone, and sandstone were uplifted out of the water, the sandstone was eroded away, the shale and limestone submerged back under water, and the two shale layers were later deposited on the erosional surface, creating an unconformity where the sandstone used to be.
- 30) _____ Shale is the middle layer. An earthquake caused the rock to the right of the fault to slide downward.
- 31) _____ The quartz grains must be older than the hematite cement because they are included within the cement. The quartz grains were cemented together with hematite after the quartz grains formed.
- 32) _____ The limestone is the youngest rock layer. The faulting occurred before the siltstone and limestone were deposited. X is an unconformity.
- 33) _____ Magma squeezed between the shale and sandstone layers causing three layers above it to fold upward forming smooth rounded hills on the surface.
- 34) _____ G is an igneous intrusion. G caused Q, A, H, and K to fold. P and O are unconformities.
- 35) _____ Fagopsis fossils can be found in shale and limestone. The vesicular basalt on top is an igneous extrusion. A fault line cuts across all of the layers indicating that it happened most recently.
- 36) _____ The layers at the bottom were originally deposited in horizontal strata under water. They tilted up and out of the water where their surface was eroded away. They later re-submerged under water where the top, horizontal strata, were deposited. There is an unconformity (buried erosional surface) between the horizontal strata above, and the tilted strata below. The unconformity represents a gap in the rock record, a place where information is missing.
- 37) _____ These were originally just three horizontal strata. An earthquake caused the rocks to the left of the fault line to go up and over the rocks to the right. Now, the oldest rocks are not ONLY on the bottom.
- 38) _____ A and B formed around the same time as magma rose up from deep inside the Earth. C is older than A because C was there first. We can see the contact metamorphism between A and C.
- 39) _____ Magma squeezed between the shale and sandstone layers causing three layers above it to fold upward forming rounded hills on the surface which later were eroded leaving behind circular ridges.
- 40) _____ Limestone, shale and sandstone were deposited under water. They were later uplifted out of the water. Soil formed on top and a stream carved a V-shaped valley into the surface.