

Catalina Homework

MATCHING MANIA: Look these up online, in a geology textbook or wherever. Each answer used is used only once. These terms will be used on the field trip.

- | | |
|---|---|
| <input type="checkbox"/> Strombolian | A. comprised of more than one rock type |
| <input type="checkbox"/> greywacke | B. compositionally homogeneous, physically variable |
| <input type="checkbox"/> mid-ocean ridge | C. upper of the two layers comprising a tectonic plate |
| <input type="checkbox"/> diatom | D. tectonic plates float on it |
| <input type="checkbox"/> asthenosphere | E. tectonic plates are made <i>entirely</i> of it |
| <input type="checkbox"/> eclogite | F. dominant rock type comprising the mantle |
| <input type="checkbox"/> blueschist | G. volcanic rock rich in silica and plagioclase feldspar |
| <input type="checkbox"/> peridotite | H. volcanic rock with an intermediate silica composition |
| <input type="checkbox"/> mantle | I. volcanic rock rich in silica and potassium feldspar |
| <input type="checkbox"/> silica | J. volcanic rock low in silica content |
| <input type="checkbox"/> normal fault | K. plutonic rock with an intermediate silica composition |
| <input type="checkbox"/> andesite | L. discreet mass of igneous rock crystallized at great depth |
| <input type="checkbox"/> crust | M. comprised of tiny crystals - invisible without magnification |
| <input type="checkbox"/> bathyal | N. comprised of large crystals - visible without magnification |
| <input type="checkbox"/> calc-alkaline | O. contains trapped gas bubbles |
| <input type="checkbox"/> pluton | P. eruption type which typically creates cinder cones |
| <input type="checkbox"/> subaerial | Q. eruption type producing large amounts of volcanic ash |
| <input type="checkbox"/> island arc | R. landform created from the extrusion of highly viscous lava |
| <input type="checkbox"/> vesicular | S. fissile mud rock |
| <input type="checkbox"/> rhyolite | T. sandstone containing rock fragments, silt and clay |
| <input type="checkbox"/> lithosphere | U. siliceous plant plankton |
| <input type="checkbox"/> serpentinite | V. sedimentary rock comprised of microcrystalline silica |
| <input type="checkbox"/> basalt | W. the compound silicon dioxide |
| <input type="checkbox"/> thrust fault | X. metamorphic rock primarily consisting of fused quartz grains |
| <input type="checkbox"/> tholeiitic | Y. metamorphic rock formed from subducted oceanic crust |
| <input type="checkbox"/> submarine fan | Z. foliated rock containing chlorite, +/- epidote, +/- actinolite |
| <input type="checkbox"/> dacite | AA. high pressure / low temperature metamorphism |
| <input type="checkbox"/> chert | BB. high pressure / high temp metamorphism, hornblende rich |
| <input type="checkbox"/> volcanic dome | CC. subduction scrapings |
| <input type="checkbox"/> quartzite | DD. low angle fracture displacing older rocks over younger rocks |
| <input type="checkbox"/> diorite | EE. fracture displacing younger rocks onto older rocks |
| <input type="checkbox"/> Plinian | FF. above sea level |
| <input type="checkbox"/> greenschist | GG. sea floor feature formed by turbidity current deposition |
| <input type="checkbox"/> phaneritic | HH. 1000 to 4000 meters below the ocean surface |
| <input type="checkbox"/> accretionary wedge/prism | II. subduction-formed archipelago |
| <input type="checkbox"/> aphanitic | JJ. divergent plate boundary-formed mountain range |
| <input type="checkbox"/> polymictic | KK. mid-ocean ridge basalt |
| <input type="checkbox"/> shale | LL. series of rock types found above subduction zones |
| <input type="checkbox"/> amphibolite | MM. hydrated, metamorphosed mantle |

FILL-IN FRIVOLITY:

ERA	PERIOD		EPOCH	Millions of years ago
Cenozoic	Quaternary		Holocene	
				.01
			Pliocene	
			Oligocene	33.9
	Paleogene			55.8
			Paleocene	
	Jurassic			
	Triassic			
Paleozoic	Permian			
	Pennsylvanian			
	Mississippian			
	Devonian			
	Silurian			
	Ordovician			
Precambrian	Cambrian			

Questions from “Geology of Santa Catalina Island” by Stephen M. Roland

1. How old are the volcanic and plutonic rocks on Catalina?
2. How old is the Catalina Schist?
3. Besides Catalina Island, where else does the Catalina Schist outcrop in Southern California?
4. Compare and contrast the Catalina Schist with the Franciscan Complex of the California Coast ranges:
5. At what depth range (in kilometers) was the Catalina Schist metamorphosed?
6. In what tectonic environment was the Catalina Schist metamorphosed?
7. What are the temperatures of formation for Blueschist facies metamorphism? _____
Greenschist facies? _____ Amphibolite facies? _____
8. What is the “surprising thing” about the structural arrangement of these three metamorphic facies on Catalina Island?
9. How did this structural arrangement originate?
10. What type of fault separates the three metamorphic facies?
11. What kind of rock does chert become under amphibolite-grade metamorphism?
12. What is the pre-metamorphic parent rock from which eclogite is derived?
13. What is the pre-metamorphic parent rock from which serpentinite is derived?
14. What evidence suggests that the subduction zone in which the Catalina Schist was metamorphosed was newly formed?
15. On what part of Catalina Island are Early Tertiary rocks exposed and in what tectonic environment were they deposited?
16. Why are “Poway Conglomerates” missing from Catalina Island?

17. Other than both being Miocene and igneous, what is the genetic relationship between the Catalina pluton and the dacites of the Fisherman's Cove area?

18. What evidence suggests that exposures of Catalina Schist were more much more extensive during the Miocene than they are today?

19. What is the origin of the schist breccia in the Fisherman's Cove area?

20. Why is it unlikely that an island-arc environment is unlikely for the origin of the volcanic rocks on Catalina?

21. What caused Catalina to rotate clockwise at least 60 degrees?

22. Are marine terraces common on Catalina? Why or why not?