Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading

Section: How Rock Deforms

1. What is deformation?

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_____

ISOSTASY

_____ 2. When the weight of part of Earth's crust changes, what sometimes occurs?
a. isostasy
b. isolation
c. deformation
d. lithoformation

_____ 3. Earth's crust is part of the
a. lithosphere.
b. asthenosphere.
c. upper mantle.
d. lower mantle.

_____ 4. When parts of the lithosphere thicken and become heavier, they
a. push up the atmosphere.
b. sink deeper into the asthenosphere.
c. push up the asthenosphere.
d. are thrust into the atmosphere.

_____ 5. If parts of the lithosphere thin and become lighter,
a. they push down the mantle.
b. they push up the asthenosphere.
c. they push up the atmosphere.
d. the lithosphere rises higher in the asthenosphere.

_____ 6. A condition of gravitational and buoyant equilibrium between Earth's lithosphere and asthenosphere is called
a. isostasy.
b. deformation.
c. slippage.
d. downward pressure.

7. How often do isostatic adjustments occur in mountainous regions?

_____

8. What is the effect of erosion on mountains?

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_____

_____

9. Describe the process called *uplift.*

_____

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_____

10. Describe the process called *subsidence.*

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_____

11. When glaciers and ice sheets melt, what happens to the land they covered and to the ocean floor?

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_____

_____

STRESS

_____ 12. What changes occur in rock in Earth's crust as the lithosphere moves?

a. It is liquified, solidified, and cemented.
b. It is squeezed, stretched, and twisted.
c. It keeps its shape because it is extremely hard.
d. It is stressed until it shatters like glass.

_____ 13. What is stress?

a. the cracks caused by squeezing, stretching, and twisting
b. the type of isostatic adjustment the crust makes
c. the type of force exerted on each unit of area
d. the amount of force exerted on each unit of area

_____ 14. The type of stress that squeezes and shortens a body is called
- a. collision.
- b. tension.
- c. compression.
- d. convergence.

_____ 15. In addition to changing the shape of a body of rock, compression
- a. pushes rocks higher up or deeper down into the crust.
- b. pulls rocks higher up into the crust.
- c. pushes rocks deeper down into the crust.
- d. transforms tectonic plates.

_____ 16. Compression occurs where
- a. tectonic plates pull apart.
- b. tectonic plates are stable.
- c. tectonic plates collide.
- d. Tectonic plates neither pull apart nor collide.

_____ 17. The type of stress known as *tension*
- a. squeezes a body and reduces its volume.
- b. stretches and pulls a body apart.
- c. forces rock together.
- d. causes explosions.

_____ 18. When tension pulls rocks apart, the rocks
- a. become distorted.
- b. thicken.
- c. take up more volume.
- d. become thinner.

19. Where is one place that tension occurs?

_____

_____

20. What effect does shear stress have?

_____

_____

_____

_____

21. What happens to sheared rock as it slides past neighboring rock?

_____

_____

22. Where is shear stress common?

_____

_____

_____

STRAIN

_____ 23. What is strain?
- a. the result of tension on rock
- b. any change in shape or volume of rock caused by stress
- c. when rock withstands any pressure put on it without changing
- d. when rock breaks because of compression

_____ 24. The amount of stress that rock can withstand without changing shape permanently is
- a. unlimited.
- b. nearly unlimited.
- c. limited.
- d. limited, but rarely tested.

_____ 25. Materials that break as a result of stress are said to be
- a. brittle.
- b. fragile.
- c. delicate.
- d. ductile.

_____ 26. Materials that bend or deform without breaking as a result of stress are referred to as
- a. brittle.
- b. fragile.
- c. delicate.
- d. ductile.

27. What affects whether rock is brittle or ductile?

_____

28. What other two factors also affect how rock will deform?

_____

_____

29. In what way is rock likely to deform at lower temperature and pressure? at higher temperature and pressure?

_____

_____

30. What three factors determine the type of strain that stress will cause to rocks?

_____

_____

_____

FOLDS

_____ 31. What is a fold?
- a. stress that causes deformed rock
- b. rock that causes deformation
- c. a bend in rock layers that results from stress
- d. a ductile strain of rock

_____ 32. Rock folds are most easily observed where
- a. magma from volcanoes spreads downward.
- b. flat layers of rock were compressed inward.
- c. jagged layers of rock were squeezed outward.
- d. earthquakes flattened layers of rock.

_____ 33. Which of the following is true of folds?
- a. Cracks never appear, and the rock layers always remain intact.
- b. Sometimes cracks appear, but the rock layers never remain intact.
- c. Cracks never appear, but usually the rock layers remain intact.
- d. Sometimes cracks appear, but usually the rock layers remain intact.

34. What are two types of stress that can cause a fold?

_____

_____

35. What are the sloping sides of folds called, and what is the area in a fold called where limbs meet at the bend in the rock layer?

_____

36. What is the term for a plane that could slice a symmetrical fold?

_____

37. If a fold appears to be lying on its side, the fold is said to be _____.

38. Why is each fold unique?

_____

_____

39. To categorize a fold, what do scientists study?

_____

_____

In the space provided, write the letter of the definition that best matches the term or phrase.

_____ 40. anticline

_____ 41. syncline

_____ 42. monocline

_____ 43. ridge

a. a fold in which both limbs are horizontal or almost horizontal

b. a large, narrow strip of elevated land; can occur near mountains

c. a fold in which the youngest layer is in the center; commonly bowl shaped

d. a fold in which the oldest layer is in the center; commonly arch shaped

44. How do monoclines form?

_____

_____

_____

45. Sometimes, a large anticline forms a(n) _____.

46. What type of fold may form a valley?

_____

47. Why can the simple landscape patterns of valleys that are synclines and ridges that are anticlines change over time?

_____

_____

FAULTS

_____ 48. Stresses on rock close to Earth's surface, where temperatures and pressures are low, may cause the rock to
a. collapse.
b. become ductile.
c. bend.
d. break.

In the space provided, write the letter of the definition that best matches the term or phrase.

_____ 49. fracture

_____ 50. fault

_____ 51. fault plane

_____ 52. hanging wall

_____ 53. footwall

a. the surface along which the motion occurs in a fault

b. the rock below the fault plane in a nonvertical fault

c. a break along which one block slides relative to another

d. a break around which there is no movement of the surrounding rock

e. the rock above the rock plane in a nonvertical fault

54. What is a normal fault, and where does it usually form?

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_____

_____

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Directed Reading *continued*

55. What kind of landforms can normal faults form?

56. How does a reverse fault form?

57. What is a thrust fault?

58. Where are reverse faults and thrust faults common?

59. What does the strike of a fault describe?

60. What is a strike-slip fault?

61. What is one example of a large fault system?