



"Designing Walls" Unit Assessment

Today the date is:			
MONTH	DAY		YEAR
<input type="radio"/> January			<input type="radio"/> 2006
<input type="radio"/> February			<input type="radio"/> 2007
<input type="radio"/> March	(0)	(0)	<input type="radio"/> 2008
<input type="radio"/> April	(1)	(1)	<input type="radio"/> 2009
<input type="radio"/> May	(2)	(2)	<input type="radio"/> 2010
<input type="radio"/> June	(3)	(3)	<input type="radio"/> 2011
<input type="radio"/> July		(4)	<input type="radio"/> 2012
<input type="radio"/> August		(5)	
<input type="radio"/> September		(6)	
<input type="radio"/> October		(7)	
<input type="radio"/> November		(8)	
<input type="radio"/> December		(9)	

Marking Instructions	
<ul style="list-style-type: none"> • Use a No. 2 pencil or a blue or black ink pen only. • Do not use pens with ink that soaks through the paper. • Make solid marks that fill the response completely. • Make no stray marks on this form. 	
CORRECT: ●	INCORRECT: ⊗ ⊘ ⊙ ⊚

For the questions below, mark the **BEST** answer.

My initials:		
FIRST	MIDDLE	LAST
(A)	(A)	(A)
(B)	(B)	(B)
(C)	(C)	(C)
(D)	(D)	(D)
(E)	(E)	(E)
(F)	(F)	(F)
(G)	(G)	(G)
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(I)	(I)	(I)
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(M)	(M)	(M)
(N)	(N)	(N)
(O)	(O)	(O)
(P)	(P)	(P)
(Q)	(Q)	(Q)
(R)	(R)	(R)
(S)	(S)	(S)
(T)	(T)	(T)
(U)	(U)	(U)
(V)	(V)	(V)
(W)	(W)	(W)
(X)	(X)	(X)
(Y)	(Y)	(Y)
(Z)	(Z)	(Z)

I am a:
<input type="radio"/> Girl
<input type="radio"/> Boy

I was born in:
MONTH BORN
<input type="radio"/> January
<input type="radio"/> February
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Do Not Mark	Do Not Mark
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1. What are earth materials?

- (A) human-made things that can be recycled
- (B) non-living things that come from the earth
- (C) structures on the earth like walls and roads
- (D) natural parts of the earth like rocks and plants

2. A car company wants to make a new kind of car. How would a materials engineer help?

- (A) draw the shape of the car
- (B) connect wires to the lights
- (C) choose the metal for the body
- (D) decide where to put the engine

3. Soil is a mixture of many substances. It may include:

- (A) sun, water, clay, and sand
- (B) sand, clay, plastic, and pebbles
- (C) sand, clay, dead plants, and dead animals
- (D) leaves, twigs, sun, and pebbles

A girl is making a chair. What would be the BEST material to use if she wants to make a ...

4. ...chair that she can leave out in the rain, that is easy to dry off?

- (A) cloth
- (B) plastic
- (C) wood
- (D) brick

5. ...chair that won't move on windy days?

- (A) cloth
- (B) plastic
- (C) wood
- (D) brick

6. ...soft place to sit?

- (A) cloth
- (B) plastic
- (C) wood
- (D) brick

7. ...fireproof chair?

- (A) cloth
- (B) plastic
- (C) wood
- (D) brick

8. Which is an example of materials engineering?

- (A) designing circuits for cell phones
- (B) designing devices that play music
- (C) designing a plastic for making boats
- (D) mixing paints to make a new color

9. Some people invented a new material that can get very hot without melting. They are using this material in the Space Shuttle. How else could this material be used?

- (A) to design new baking pans
- (B) to design a new kind of oven
- (C) both A and B are possible
- (D) neither A nor B is possible

10. A student built a wall with rocks held together by mortar made of soil, sand, and clay. When he tested the wall, the mortar crumbled and didn't stick together. Which is the BEST way to improve the mortar?

- (A) Add more soil.
- (B) Add more clay.
- (C) Add more sand.
- (D) Add more water.

11. What material could be used to make a cup?

- (A) glass
- (B) plastic
- (C) wood
- (D) all of the above

12. Which of these is made from earth materials?

- (A) road
- (B) brick
- (C) castle
- (D) all of these

13. A girl is making a sculpture that sticks together well when it's wet, but easily crumbles after it dries. What material is she MOST LIKELY using?

- (A) clay
- (B) sand
- (C) rocks
- (D) gravel

14. A boy has two rocks. Both are the same kind of rock. What property of his two rocks is MOST likely to be the same?

- (A) size
- (B) shape
- (C) color
- (D) weight

15. Which of the following is a property of a brick?

- (A) rough
- (B) made out of clay
- (C) can be used to make walls
- (D) all of the above

16. Which of the following has the greatest effect on the ability of soil to hold water?

- (A) the age of the soil particles
- (B) the size of the soil particles
- (C) the color of the soil particles
- (D) the hardness of the soil particles

17. What would a materials engineer do for her job? Choose the BEST answer.

- (A) Design a cement truck.
- (B) Design a wedding dress.
- (C) Design a machine to dig up rocks.
- (D) Design a paint that prevents rusting.

18. A girl wants to build a dog house for her new puppy. It will need to keep the puppy warm and dry. What material could she use to build the dog house?

- (A) wood
- (B) brick
- (C) plastic
- (D) any of these materials would work

19. If you were designing a raincoat, which would be the BEST material to use?

- (A) Material 1 is absorbent, red, and soft.
- (B) Material 2 is waterproof, white, and flexible.
- (C) Material 3 is durable, brown, and flexible.
- (D) Material 4 is waterproof, yellow, and too stiff to bend.

20. **Can a material have different properties when it is wet and when it is dry?**

- Ⓐ Yes, but only if it is a human-made material.
- Ⓑ No, the properties of a material don't change.
- Ⓒ Yes, adding water can change the properties of a material.
- Ⓓ No, adding water will not change the properties of a material.

21. **How is clay different from sand?**

- Ⓐ Clay is human-made.
- Ⓑ Clay is not an earth material.
- Ⓒ Clay is made up of smaller particles than sand
- Ⓓ Clay and sand are not different, they are the same.

22. **A boy has two blocks. He wants to know if they are both made of the same material. What information about the two blocks would help him to decide?**

- Ⓐ Both blocks are the same size.
- Ⓑ Both blocks are the same shape.
- Ⓒ Both blocks are the same weight.
- Ⓓ Both blocks are the same texture.

23. **When wet clay dries, what happens?**

- Ⓐ The clay becomes darker.
- Ⓑ The clay becomes hard.
- Ⓒ The clay turns into a powder.
- Ⓓ All of the above.

A student is making a mortar to stick the parts of a statue together.

24. **Which of the following materials should he use in his mortar so it is sticky?**

- Ⓐ soil
- Ⓑ clay
- Ⓒ sand
- Ⓓ pebbles

25. **Which material should he add to his mortar so it doesn't crack?**

- Ⓐ soil
- Ⓑ clay
- Ⓒ water
- Ⓓ it won't help to add another material

26. **Which makes the best mortar material?**

- Ⓐ A mixture of clay and water.
- Ⓑ A mixture of sand and water.
- Ⓒ A mixture of clay, soil, and water.
- Ⓓ A mixture of sand, soil, and water.

27. **Which of these is made from a human-made material?**

- Ⓐ a clay pot
- Ⓑ a rock wall
- Ⓒ a sand castle
- Ⓓ a plastic shovel

28. **When dry clay gets wet, what happens?**

- Ⓐ The clay becomes darker.
- Ⓑ The clay becomes stickier.
- Ⓒ The clay becomes more slippery.
- Ⓓ All of the above.

29. **A child is building a fort out of sticks. Which of these materials would work BEST to hold the sticks together?**

- Ⓐ wet soil
- Ⓑ wet clay
- Ⓒ wet sand
- Ⓓ wet pebbles

30. **What is a property of the material that is used to make a bicycle?**

- Ⓐ it has two wheels
- Ⓑ it has a seat to sit on
- Ⓒ it does not break easily
- Ⓓ all of the above

31. **A company is creating a new type of material. How would a materials engineer help?**

- Ⓐ Test how strong the material is.
- Ⓑ Make posters to sell the material.
- Ⓒ Use the material to build a car engine.
- Ⓓ A materials engineer would not help.

32. **A boy has a piece of cloth. What can he use it for?**

- Ⓐ He can use it as a blanket to keep warm.
- Ⓑ He can make a bag out of it to carry things.
- Ⓒ He can use it as a towel to dry things.
- Ⓓ All of the above.

33. **A girl wants to wrap a present for her mother. What would be the BEST property to have in a wrapping material?**

- Ⓐ a stiff material
- Ⓑ a clear material
- Ⓒ a foldable material
- Ⓓ a thick material

34. **A materials engineer has been asked to help design a new running shoe. What might she do to design the shoe?**

- Ⓐ Ask a running coach what properties the running shoe should have.
- Ⓑ Design materials that have properties that will be important for the shoe.
- Ⓒ Both A and B.
- Ⓓ A materials engineer would not help to design a shoe.

Question 3 from MCAS 1998 Science and Technology/Engineering Assessment - Grade 4.
Question 14 from MCAS 2003 Science and Technology/Engineering Assessment - Grade 5.
Question 16 from MCAS 2007 Science and Technology/Engineering Assessment - Grade 5.