



# "Designing Windmills" 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	<input type="radio"/> 0	<input type="radio"/> 2008
<input type="radio"/> April	<input type="radio"/> 1	<input type="radio"/> 2009
<input type="radio"/> May	<input type="radio"/> 2	<input type="radio"/> 2010
<input type="radio"/> June	<input type="radio"/> 3	<input type="radio"/> 2011
<input type="radio"/> July		<input type="radio"/> 2012
<input type="radio"/> August		
<input type="radio"/> September		
<input type="radio"/> October		
<input type="radio"/> November		
<input type="radio"/> December		

Marking Instructions
<ul style="list-style-type: none"> <li>Use a No. 2 pencil or a blue or black ink pen only.</li> <li>Do not use pens with ink that soaks through the paper.</li> <li>Make solid marks that fill the response completely.</li> <li>Make no stray marks on this form.</li> </ul> <p><b>CORRECT:</b> ●      <b>INCORRECT:</b> ☉ ☒ ☐ ☑</p>

My initials:		
FIRST	MIDDLE	LAST
(A)	(A)	(A)
(B)	(B)	(B)
(C)	(C)	(C)
(D)	(D)	(D)
(E)	(E)	(E)
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(X)	(X)	(X)
(Y)	(Y)	(Y)
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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 is wind?

- (A) solar energy
- (B) air that is moving
- (C) a force caused by fans
- (D) weather that is moving

### 2. A boy uses a screwdriver to turn a screw. Does the boy put energy into the screwdriver?

- (A) No, a screwdriver does not use energy.
- (B) No, a screwdriver does not have moving parts.
- (C) Yes, the energy is used to turn the screw.
- (D) Yes, but only if the screwdriver has a battery or a plug.

### 3. Does the wind have energy?

- (A) No, the wind uses up energy.
- (B) No, the wind can't have energy.
- (C) No, the wind has solar energy.
- (D) Yes, the wind has energy to move things.

4. Which of these is a technology designed to use the energy of the wind?

(A) kite



(B) sailing ship



(C) wind turbine



(D) all of these



5. Choose the BEST answer. A wind turbine:

(A) makes wind energy.

(B) uses electricity to run a motor.

(C) changes electrical energy into other forms of energy.

(D) changes the wind's energy into other forms of energy.

6. When a boy is riding a bike, how does the bike get energy?

(A) The boy eats food.

(B) The boy pushes on the pedals.

(C) The boy rides it in the sunshine.

(D) The bike does not get energy.

7. Which of these items is a machine?

(A) pliers



(B) lawnmower



(C) kitchen knife



(D) all of these are machines



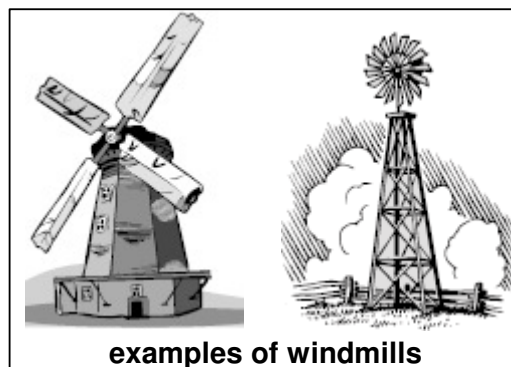
8. What do windmills do?

(A) grind grain into flour

(B) give energy to machines

(C) pump water up from the ground

(D) all of the above



**9. Windmills and sailboats:**

- (A) make wind.
  - (B) use wind energy.
  - (C) use solar energy.
  - (D) don't need energy to move.
- 

**10. A girl is making a toy windmill, but cannot make it spin. Which of the following things would NOT help her to improve her windmill?**

- (A) Add more blades
- (B) Change the angles of the blades
- (C) Put holes in the blades to let air through
- (D) Make the blades out of a different material

**11. The girl improves her windmill so it can spin. Now she wants it to lift a toy, but it is not strong enough. How could she improve her windmill so it can lift more weight?**

- (A) Use more blades
  - (B) Use fewer blades
  - (C) Make the blades heavier
  - (D) Windmills can't lift weight
- 

**12. Choose the BEST answer.**

**Mechanical Engineers:**

- (A) repair cars.
- (B) drive trains.
- (C) build robots.
- (D) design machines.

**13. How does the wind move things?**

- (A) An invisible cloud blows on things.
- (B) Lots of air all pushes the same way.
- (C) Energy from the sun pushes and moves things.
- (D) The earth turns and pushes things through the air.

**14. How does a car get energy for driving?**

- (A) The parts of the car move
- (B) The car is made with energy inside
- (C) The driver puts gas into the gas tank
- (D) The car does not need energy for driving

**15. What does a mechanical engineer need to know about for his or her job?**

- (A) energy
- (B) machines
- (C) properties of materials
- (D) all of the above

**16. When a girl is using a hammer, how does she put energy into the hammer?**

- (A) She eats food.
- (B) She uses her muscles to put energy into the hammer.
- (C) The hammer is made with energy inside it.
- (D) She does not put energy into the hammer.

A boy is making a toy sailboat to sail in his pool.

17. What property of the sail is MOST IMPORTANT for making a sail to move the boat?

- A how big the sail is
- B how heavy the sail is
- C what material the sail is made of
- D how well the sail catches the wind



18. What material would work to make the sail?

- A cloth
- B plastic
- C aluminum foil
- D any of these materials would work

19. What is the BEST thing the boy can do to make sure the sail can move the boat?

- A make the sail out of cloth
- B make the sail soft and flexible
- C makes the edges of the sail stiff
- D cut the sail into a triangle shape

20. The boy makes a sail for the boat, but he finds that the boat keeps tipping over when a breeze blows on it. What is the BEST thing he could do to fix it?

- A make the sail larger
- B make the sail shorter
- C make the sail into a triangle shape
- D make the sail from a heavier material

21. Which of these machines does the same kind of work (cutting) as a pair of scissors?

(A) pliers



(B) kitchen knife



(C) pincers



(D) barbecue tongs



22. Which of these machines has parts that move in the same way as a pair of scissors?

(D) pliers



(E) garden shears



(F) pincers



(G) all of these



23. What is a mechanical engineer MOST LIKELY to do for his or her job?

(A) repair machines

(B) improve machines

(C) predict the weather

(D) install electrical wire in houses

24. Which is an example of the wind doing work?

(A) A fan cooling a room.

(B) A bicyclist riding downhill.

(C) A sailboat sailing across a pond.

(D) The wind cannot do work.

25. What happens to the energy a person puts into a stapler?

(A) It is stored for later use.

(B) Nothing happens to the energy.

(C) It is used to push a staple into paper.

(D) People don't put energy into staplers.

26. Which is true?

(A) All machines have engines.

(B) All machines have moving parts.

(C) All machines use energy to do something.

(D) All of the above are true.

27. **A car company is designing a new kind of car. How would mechanical engineers help?**

- Ⓐ They would build the cars in the factory.
- Ⓑ They would fix the car engines when they break.
- Ⓒ They would design the parts of the car that move.
- Ⓓ All of the above.

28. **Which of the following can show how hard the wind is blowing?**

- Ⓐ a cloud
- Ⓑ an anemometer
- Ⓒ a tree
- Ⓓ all of the above

29. **What is the difference between a windmill and a wind turbine?**

- Ⓐ Windmills aren't made any more.
- Ⓑ Windmills are larger and have more blades.
- Ⓒ Wind turbines turn electricity into useful work.
- Ⓓ Wind turbines transform the wind's energy into electricity.

30. **A toy company is designing a kind of toy dog that walks, barks, and rolls over. How would mechanical engineers help?**

- Ⓐ They would design the machines to make the toys.
- Ⓑ They would design the parts of the dogs that move.
- Ⓒ Both A and B.
- Ⓓ A mechanical engineer would not help to design toy dogs.