

## Wind Turbines Post-Quiz Answer Key

**A. Circle the best choice:**

1. **energy:**

quantitative

qualitative

2. **water:**

renewable  
energy source

nonrenewable  
energy source

3. **fossil fuel:**

renewable  
energy source

nonrenewable  
energy source

4. **gasoline:**

renewable  
energy source

nonrenewable  
energy source

5. **wind:**

renewable  
energy source

nonrenewable  
energy source

6. **natural gas:**

renewable  
energy source

nonrenewable  
energy source

7. **heat:**

energy form

energy source

8. **sun:**

energy form

energy source

9. **light:**

energy form

energy source

10. **gravity:**

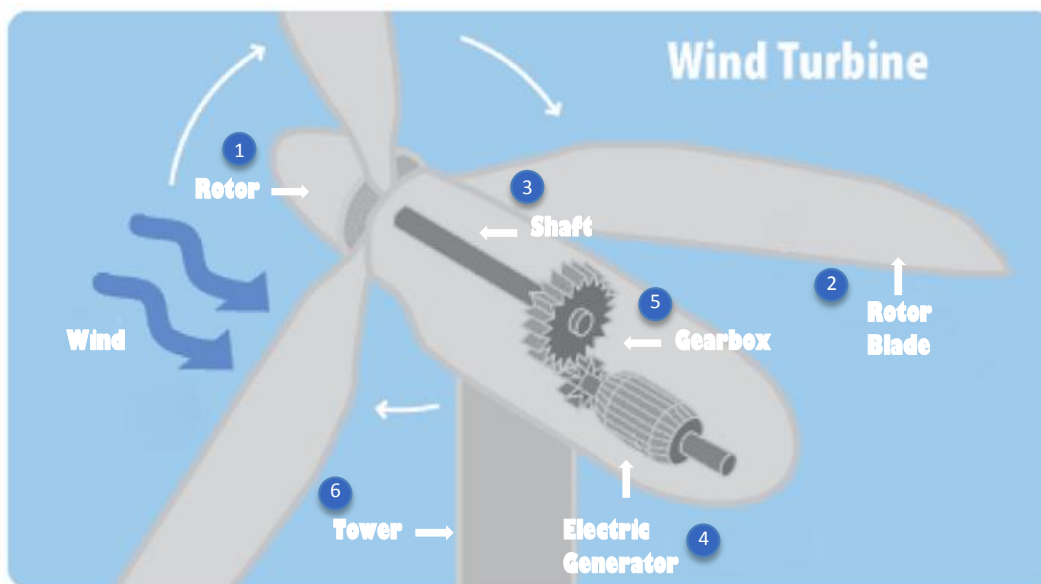
energy form

energy source

**B. Use the following words to label the six basic components that comprise a wind turbine:**

tower  
shaft  
electric generator

rotor  
gearbox  
rotor blade



**C. Write a short description of each:**

**1. Rotor and rotor blade:**

A **rotor** is the heart of a wind turbine. It is the rotating central piece to a functioning wind turbine. Large propeller-like blades known as **rotor blades** extend from the **rotor** to capture the dynamic motion of the wind and its kinetic energy. The blowing wind applies a force against the rotor blades and causes the **rotor** to rotate (hence the name **rotor**). With this process, the wind's kinetic energy is converted to mechanical rotational energy to spin the rotor blades.

**2. Shaft:**

The **rotor** is connected to a rod known as **shaft**. The **shaft** is an apparatus that directly connects the **rotor** to an **electrical generator**. The **shaft's** purpose is to transfer the rotational mechanical energy generated by the rotating rotor directly to the input of the **electrical generator**.

**3. Gearbox:**

Most wind turbines contain a **gearbox** connected to the shaft, which turns the slow rotation of the **rotor blades** and **shaft** into faster rotations that are more suitable to drive an electrical generator.

**4. Electric generator:**

The rotating shaft directs the rotation of a **rotating electrical generator**. The rotating generator is placed between two magnets to induce electricity to flow through a conductor through a process known as **electromagnetic induction**. With this process, rotational mechanical energy is converted into electrical energy, which can be stored and transmitted as electricity to an electric utility company.