

Energy and Climate Unit Test

Name: _____

Date: _____

Multiple Choice: Circle the best answer.

1. Uranium-235, used in nuclear energy, formed billions of years ago and no more can be created. This means that uranium-235 is:
 - a. A renewable resource
 - b. A non-renewable resource
 - c. A resource useful for geothermal energy
 - d. A resource with a short replacement time

 2. One of the pros of using hydroelectric power is that it uses a renewable resource. A con of using hydroelectric power is that:
 - a. It only works when the weather is good
 - b. It costs less than geothermal energy
 - c. It can only be located on flowing water
 - d. It emits tons of greenhouse gases

 3. An Adélie penguin could acclimate to climate change by:
 - a. Moving to an ice sheet closer to the South Pole
 - b. Growing feathers that are better at repelling rain
 - c. Learning to avoid polar bears
 - d. Passing genes for buoyancy to its offspring

 4. From particle to particle, conductors allow for the free movement of:
 - a. Atoms
 - b. Electrons
 - c. Neutrons
 - d. Protons

 5. Which is an example of precise and accurate data measurement?
 - a. Skipping the question because the measurement is zero
 - b. Estimating the number of Penguins in an image
 - c. Recording the exact length, in millimeters, of a leaf
 - d. Measuring a person's height in number of human hands
-

*True or False: Answer "T" if the statement is true. Answer "F" if the statement is false, **and change the statement to be True.***

6. ____ In an experiment using citizen science, citizens participate primarily in the conclusion stage of the scientific process.

7. ____ The potential energy of a ball held above your head changes to kinetic energy when you drop it.

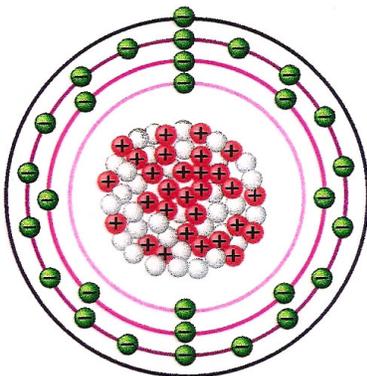
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8. _____ The blades of a wind turbine use electromagnetic energy to spin the shaft of the generator.
9. _____ Renewable energy accounts for about 85% of the energy used in the United States.
10. _____ Long, sharp quills are an adaptation of the African crested porcupine.

Matching: Write the letter corresponding to the correct answer in each blank.

11. _____ This non-renewable resource is used as fuel for transportation
12. _____ Production of this energy source, used primarily for electricity generation, has been in decline since 2000
13. _____ The replacement time of this energy source could be equal to the lifecycle of a tree, grass, or corn
14. _____ Heat deep inside the Earth fuels this type of energy
15. _____ The desert is a good place to install this renewable energy technology
- A. Biomass
B. Coal
C. Geothermal
D. Hydroelectric
E. Natural Gas
F. Nuclear
G. Oil
H. Solar
I. Wind

Copper



29 
34 
29 

Directions: Answer "Yes" or "No" to the following statements based on the diagram to the left.

I can identify this atom as a conductor because...

16. It has the atomic number of 29. _____
17. It has 4 electrons in its inner shell. _____
18. It has 1 valence electron. _____

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Completion: Fill in each blank with the best possible response from the word bank

chemical	conduction	convection	electrical	electromagnetic
mechanical	nuclear	photovoltaic	potential	thermal

19. When sunlight is turned directly into electrical energy by semiconductors, this is called the _____ effect.
20. The splitting of atomic nuclei, which results in a great release of heat, is the basis for _____ energy.
21. Microwaves and visible light from the sun are both examples of _____ energy.
-

Short Answer: Answer each question with a phrase or sentence.

22. Describe an example of heat transfer via convection.
23. How are maps used to identify locations for windmills?
24. Why does the kinetic energy of water increase as it is heated?
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Short Essay

25. What is the difference between an animal adaptation and acclimation? Give one example for each. Use the back of this page if needed.

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Extended Essay: You may draw a diagram to go along with your written description if you would like.

26. Choose 1 type of renewable energy technology. How does it work? What are the pros and cons of using it? *Hint: Think about the flow and types of energy.*

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Name: _____

Date: _____

Whole test = 93 Points

Multiple Choice: Circle the best answer. 2 points each = 10 points

1. Uranium-235, used in nuclear energy, formed billions of years ago and no more can be created. This means that uranium-235 is:
 - a. A renewable resource
 - b. A non-renewable resource**
 - c. A resource useful for geothermal energy
 - d. A resource with a short replacement time
2. One of the pros of using hydroelectric power is that it uses a renewable resource. A con of using hydroelectric power is that:
 - a. It only works when the weather is good
 - b. It costs less than geothermal energy
 - c. It can only be located on flowing water**
 - d. It emits tons of greenhouse gases
3. An Adélie penguin could acclimate to climate change by:
 - a. Moving to an ice sheet closer to the South Pole**
 - b. Growing feathers that are better at repelling rain
 - c. Learning to avoid polar bears
 - d. Passing genes for buoyancy to its offspring
4. From particle to particle, conductors allow for the free movement of:
 - a. Atoms
 - b. Electrons**
 - c. Neutrons
 - d. Protons
5. Which is an example of precise and accurate data measurement?
 - a. Skipping the question because the measurement is zero
 - b. Estimating the number of Penguins in an image
 - c. Recording the exact length, in millimeters, of a leaf**
 - d. Measuring a person's height in number of human hands

True or False: Answer "T" if the statement is true. Answer "F" if the statement is false, and change the statement to be True. 2 points each for True, 2 Points for False and 1 Point for Correction of false statement = 13 points

6. **F** In an experiment using citizen science, citizens participate primarily in the ~~conclusion~~ stage of the scientific process. (gathering data / experiment)

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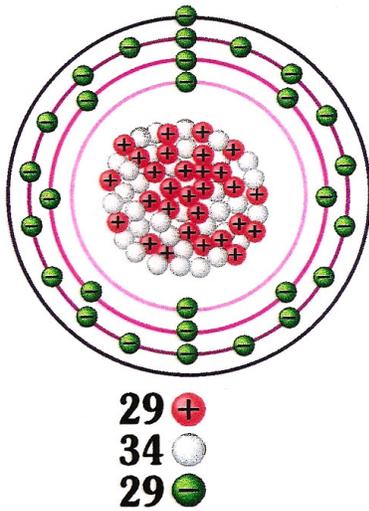
7. T The potential energy of a ball held above your head changes to kinetic energy when you drop it.
 8. F The blades of a wind turbine use ~~electromagnetic~~ energy to spin the shaft of the generator. (mechanical)
 9. F Renewable energy accounts for about 85% of the energy used in the United States. (Non-renewable)
 10. T Long, sharp quills are an adaptation of the African crested porcupine.
-

Matching: Write the letter corresponding to the correct answer in each blank. 2 points each= 10 points

11. G This non-renewable resource is used as fuel for transportation
 12. B Production of this energy source, used primarily for electricity generation, has been in decline since 2000
 13. A The replacement time of this energy source could be equal to the lifecycle of a tree, grass, or corn
 14. C Heat deep inside the Earth fuels this type of energy
 15. H The desert is a good place to install this renewable energy technology
- A. Biomass
B. Coal
C. Geothermal
D. Hydroelectric
E. Natural Gas
F. Nuclear
G. Oil
H. Solar
I. Wind
-

Energy and Climate Unit Test

Copper



Directions: Answer "Yes" or "No" to the following statements based on the diagram to the left. **2 points each= 6 points**

16. It has the atomic number of 29. No
17. It has 4 electrons in its inner shell. No
18. It has 1 valence electron. Yes

Completion: Fill in each blank with the best possible response from the word bank

chemical	conduction	convection	electrical	electromagnetic
mechanical	nuclear	photovoltaic	potential	thermal

2 points each= 6 points

19. When sunlight is turned directly into electrical energy by semiconductors, this is called the photovoltaic effect.
20. The splitting of atomic nuclei, which results in a great release of heat, is the basis for nuclear energy.
21. Microwaves and visible light from the sun are both examples of electromagnetic energy.

Short Answer: Answer each question with a phrase or sentence. **4 points each = 12 points**

22. Describe an example of heat transfer via convection.

Convection is the transfer of heat via the circulation of a fluid such as a liquid or gas. Possible examples include currents in the oceans, molten rock, currents in the Earth's atmosphere, currents within a pot of heating water, and air circulation in a convection oven. *(Must mention 1 example of a current in a liquid or gas. For the pot of water, conduction is the initial cause of heating due to contact with the surface of the stove or oven. For the convection oven, mentioning air circulation is needed to contrast the heat from conduction.)*

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23. How are maps used to identify locations for windmills?

Windmills are most effective in locations where the annual average wind speed is higher. Wind resource maps show the wind power classification for a region. Typically offshore and high altitude locations are those with the highest annual average wind speed. *(Must mention wind speed and that maps display this for a location or region; +1 bonus for mention of altitude or offshore locations)*

24. Why does the kinetic energy of water increase as it is heated?

The water molecules move/vibrate faster when heated

Short Essay

25. What is the difference between an animal adaptation and acclimation? Give one example for each. Use the back of this page if needed. **12 points**

Adaptation is a change in both physical and chemical composition of an organism brought about by habitat changes, while acclimation is a physical reaction made in order to adjust to habitat changes. Adaptation is permanent, while acclimation is temporary. Adaptation is a natural and necessary process for survival of a species, while acclimation only happens when there are small changes in the habitat. Examples of adaptation: must by an evolutionary change such as long bird beaks, camouflage, quills for defense, etc. Examples of acclimation: a temporary change such as a coyote eating garbage, a bat avoiding hunting in the rain, an animal moving its nest due to disturbance.

Extended Essay: You may draw a diagram to go along with your written description if you would like.

26. Choose 1 type of renewable energy technology. How does it work? What are the pros and cons of using it? *Hint: Think about the flow and types of energy.* **24 points**

Possible topics:

Solar panel

Wind turbine

Geothermal energy

Biomass/Biofuels

Hydroelectric

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Rubric: Extended Essay				
	8 points Above Standards	6 points Meets Standards	4 points Approaching Standards	2 points Below Standards
Types of Energy	4 or more types of energy are accurately described and/or labeled.	3 types of energy are accurately described and/or labeled.	2 types of energy are accurately described and/or labeled.	0-1 types of energy are accurately described and/or labeled.
Flow of Energy	The flow of energy between all steps is described accurately.	The flow of energy from 75% of steps is described accurately.	The flow of energy from 50% of steps is described accurately.	The flow of energy from less than 50% of steps is described accurately.
Pros and Cons: Evidence	All of the evidence is specific, relevant and explanations are given that show how each piece of evidence supports the author's position.	75% of the evidence is specific, relevant and explanations are given that show how each piece of evidence supports the author's position.	At least 50% of the evidence is relevant and has an explanation that shows how that piece of evidence supports the author's position.	Evidence and examples are NOT relevant AND/OR are not explained.