

Name _____ Date _____

LIVING FOR THE FUTURE

Topic - Collecting Energy from the Sun

1. The Sun is a **renewable** source of energy.

Why are some energy sources called renewable?

2. In which 2 ways does the Sun transfer energy to Earth? _____

3. What is the name of the equipment which allows us to trap light energy from the Sun? _____

4. To what kind of energy can photocells convert light energy from the Sun?

5. Here are some of the advantages and disadvantages of using photocells: Put a red ring around the disadvantages and a green ring around the advantages.

can operate in remote locations

no power output at night

low maintenance

no need for power cables

no need for fuel

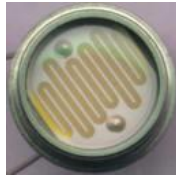
no power output when it is cloudy

long life

renewable source of energy

no polluting waste

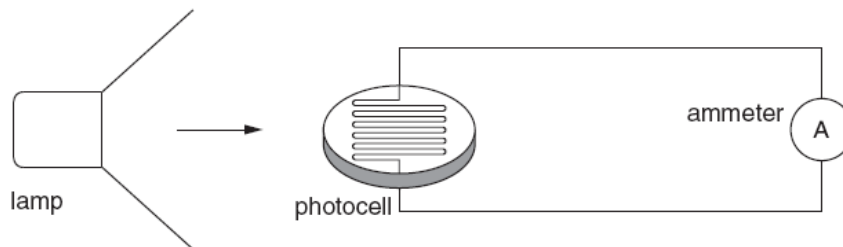
6. This is a photocell:



(i) What kind of electricity do photocells produce? _____

(ii) In what direction does direct current flow?

7. The diagram below shows an experiment with a photocell. Light from the lamp falls onto the photocell.



(i) Into what kind of energy does the photocell transfer the light energy?

(ii) There is a reading on the ammeter. What does this tell you about the circuit? _____

(iii)



Photocells are often used to power road signs.

What would happen to the size of the current if half of these photocells were covered up?

<http://www.flickr.com/photos/asterix/151969001/>

8. Wind turbines convert the wind's energy into electrical energy.



- (i) What kind of energy in the wind, is converted into electricity by the wind turbine generator? _____
- (ii) What do you think the critical factor is for the correct functioning of a wind turbine? _____

9.



Unlike when fossil fuels are burned to provide energy, wind turbines do not produce polluting gases like carbon dioxide or methane.

Write down the term given to the problem that some people think wind turbines cause.

10.



Where could wind turbines be sited to prevent the above problem and avoid taking up valuable land space? This picture gives a clue to a possible solution.

11. Although wind turbines work by converting kinetic energy into electrical energy, it is energy from the Sun which creates the wind.

Label the diagram to explain how convection currents and therefore wind is created by the Sun's energy.



12. These are solar panels.



<http://www.solaruk.net/case-study/nunningtonhall.asp>

Solar panels **absorb** heat energy from the Sun. Complete the sentences below about solar panels.

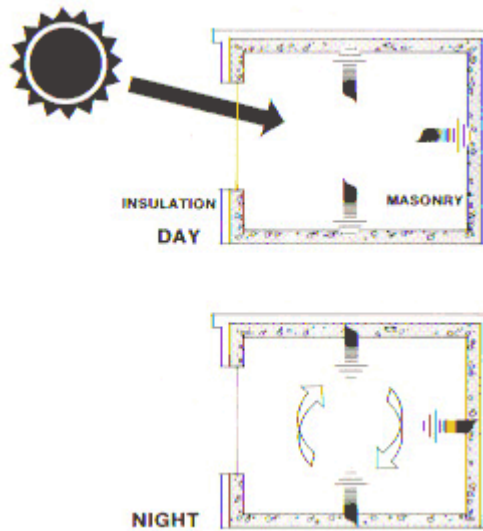
Solar panels are put onto the roof of a building to absorb _____ energy from the _____. Inside the solar panel there are lots of small tubes full of _____ which pass over a _____ plate.

Anything which is black will _____ heat energy, so the black plate warms up and _____ heat energy to the _____ in the tubes.

13. Complete the following sentences.

- (i) Photocells convert _____ into electrical energy.
- (ii) Solar panels absorb _____ energy from the Sun and transfer it to water.

14. The diagram below shows a home heating system.



- (i) What is the source of heat energy for this heating system? _____
- (ii) In which direction does the window need to face? _____
- (iii) Explain why the windows need to face in the above direction.

- (iv) Explain why the house stays warm at night.

- (v) What is the name of this kind of heating system?

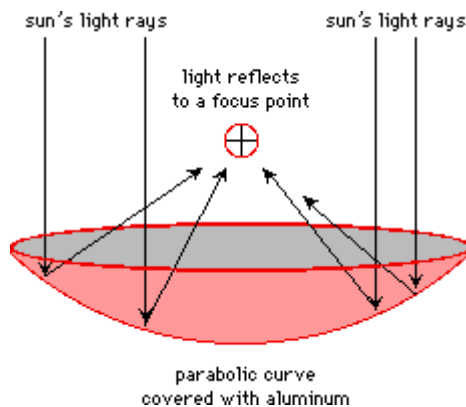
15. The picture below shows a solar cooker:



http://www.rids-nepal.org/index.php/Solar_Cooker.html

HOW A SOLAR COOKER WORKS

The Solar Cooker works on the basic principle of **reflection**. The Sun's light rays are collected by the parabolic bowl and are bounced off the shiny aluminium that covers the dish. The reflected light rays are **concentrated** to a **focus point**, the light rays are converted in to heat energy; anything placed at the focus point will **heat up** and **cook**.



What is the name of the point to which the Sun's light rays are reflected?

16. On the diagram below, draw in where the curved mirror should be placed and how the light rays from the Sun are focused onto the tin can, to cook the food.

