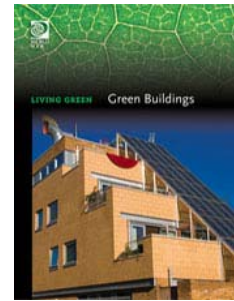


# LIVING GREEN – Green Buildings Activity Sheet



**Dictionary:** Click or tap and hold on the selected word. Then select the Dictionary option from the Quick Menu to see the word's definition.

**Glossary:** There is a glossary on pages 60-61. Terms defined in the glossary are in bold type on their first appearance on any spread (two facing pages).

Find the answers to the Matching exercise using the Glossary.

**MATCHING:** Match the word to the meaning.

Answers:	Word:	Meaning:
	1. renewable resources	A. A small fluorescent light bulb that screws into a standard light socket.
	2. sustainability	B. Water that is not pure but is only moderately dirty.
	3. compact fluorescent light bulb (CFL)	C. The process used to break down yard waste and food scraps into rich fertiliser for gardens and grass.
	4. light-emitting diode (LED)	D. A tiny device that converts the energy in sunlight to electric current
	5. embodied energy	E. The amount of heat that a warmed object radiates back.
	6. incandescent light bulb	F. Natural resources, such as trees, that can be replaced after they have been harvested.
	7. greywater	G. A tiny electrical device that generates light.
	8. compost	H. The total amount of energy required to make a product or to carry out an activity.
	9. thermal emittance	I. A conventional light bulb that produces more heat than light.
	10. solar cell	J. Any practice that adheres to principles of conservation and ecological balance.

**MULTIPLE CHOICE:** (Circle the correct answer.)

11. Go to Chapter: **WHAT IS GREEN ARCHITECTURE?**

The principle of green architecture used for buildings that make the best use of such natural elements as sunlight, wind, vegetation, and rainwater to substantially reduce "active" consumption of energy and other resources is called:

- a. Sustainability
- b. Passive design
- c. Ventilation
- d. Renewable design

12. Go to Chapter: **BUILDING MATERIALS?**

Even though concrete has high embodied energy it has some green qualities. A thick concrete floor has high \_\_\_\_\_ reducing the need for artificial heating and cooling.

- a. thermal mass
- b. energy mass
- c. solar reflectance
- d. renewable resources

13. Go to Chapter: **FLOORING**

Which of the following is NOT considered a green flooring material?

- a. Cork
- b. Bamboo
- c. Vinyl
- d. Reclaimed wood

14. Go to Chapter: **WINDOWS**

Which of the following CANNOT be used to maximise daylight inside a building?

- a. Skylights
- b. Thermal chimneys
- c. Reflective interior coatings
- d. Computer-controlled electric lights that respond to natural conditions

15. Go to Chapter: **WATER USE**

Greywater is wastewater collected from sinks, showers, and washing machines. Which of the following is used as part of a building's design to filter greywater:

- a. Green roof
- b. Solar panel
- c. Recycled material
- d. Artificial wetland

16. Go to Chapter: **HEATING AND COOLING**

Long before modern air conditioning was invented, people learned how to cool down hot buildings by drawing in cooler air from outside sources and venting warm air from inside the building. This process of exchanging inside air for outside air is called:

- a. Ventilation
- b. Mechanical refrigeration
- c. Radiant heating and cooling
- d. Condensation

**COMPREHENSION QUESTIONS:**

17. Go to Chapter: **WHAT IS GREEN ARCHITECTURE?**

Read the section on **Passive Design**

Queenscliffe Centre, a research facility on the coast of Victoria, illustrates the principle of passive design in many ways. Give an example of how this building makes the best use of the natural environment.

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18. Go to Chapter: **ELECTRICITY**

Read the chapter and watch the video  .

Buildings can become “green” by producing their own energy instead of taking it from the power grid. What are two energy alternatives used to reduce the amount of electricity needed from the power grid?

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19. Go to Chapter: **GREEN BUILDINGS?**

Read the section on the **MELBOURNE’S COUNCIL HOUSE 2**

List two green architectural features in Council House 2 (CH2) and how each feature saves energy?

1.

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2.

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## ANSWER SHEET:

Answer: Word:

- |          |   |
|----------|---|
| <u>F</u> | 1. renewable resources                  |
| <u>J</u> | 2. sustainable                          |
| <u>A</u> | 3. compact fluorescent light bulb (CFL) |
| <u>G</u> | 4. light-emitting diode (LED)           |
| <u>H</u> | 5. embodied energy                      |
| <u>I</u> | 6. incandescent light bulb              |
| <u>B</u> | 7. greywater                            |
| <u>C</u> | 8. compost                              |
| <u>E</u> | 9. thermal emittance                    |
| <u>D</u> | 10. solar cell                          |

11. b. Passive design

12. a. Thermal mass

13. c. Vinyl

14. b. Thermal chimneys

15. d. Artificial wetland

16. a. Ventilation

17. The building is a long, narrow structure surrounded by water, which is an ideal position for capturing bay breezes that can flow through the interior.

The architects designed a cooling system that uses cool seawater channelled through pipes in the building.

18. Solar power and wind power.

19. - Wind turbines are used to draw fresh air from the rooftop level down into the building.

- Five shower towers cool air and water by evaporation.

- The automated shading system reduces the building's need for cooling.

- Wasted heat is captured and used to heat water that provides radiant heating.

- An on-site water treatment plant that draws water from city sewers and cleanses it for use as greywater.

- Rainwater storage tanks provide additional greywater.

- Solar panels on the roof contribute to the building's electrical needs.

### EXTENSION ACTIVITY:

a. A reflective roof.

Dark roofs absorb much heat from sunlight, and so cause buildings to become hotter during summer. A reflective roof, or a "cool roof", reflects sunlight back instead of absorbing it. Such roofs, which usually have white surfaces, can save as much as 70 percent of energy costs during summer. However, reflective roofs may need to be cleaned from time to time, since dirt and dust reduces their reflectivity.

b. A green roof.

Putting soil and plants on a roof is a natural way to keep a building cool in the summer and warm in the winter. The plants absorb water instead of letting it run off into the sewers. They also attract wildlife that would not otherwise have a home in an urban environment. However, such a roof requires specialised skills and knowledge to build.

c. Solar panels.

Covering the roof in solar panels would turn the sunlight hitting the roof into usable energy. However, solar panels are extremely expensive. If other buildings cast shadows on the roof, its solar panels would be less effective.