

Student Inquiry
Levels 7-8

Comparing Different Types of Light Bulb

Overview

You will use Internet-based research, the corresponding factsheet and other reference sources to:

- Compare the types of light bulbs available to consumers
- Investigate the main light-emitting processes, how they work, and which processes are used by which types of light bulbs
- Consider which types of light bulb are the most environmentally friendly and why.

Inquiry 1

Before you try to answer Inquiry 1, have a go at answering supporting questions 1A, 1B, 1C, 1D and 1E on the next two pages.

You can research information on these questions by using the resources listed on page 7.

What is the difference between different types of light bulbs available today?

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What types of light bulbs are available to consumers?

Supporting question 1B

How do the types of light bulbs compare? Factors to consider: power used (Watts), power output (Watts) and/or output intensity (lumens), expected lifetime, cost, and other advantages or disadvantages e.g. safe disposal. It may be useful to construct a table to compare the variables you identify.

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Supporting question 1C

What happens in the light-emitting processes of thermal radiation, atomic emission, fluorescence and electroluminescence?

Supporting question 1D

Which of these processes produces light from the sun?

Supporting question 1E

Which process is used in each of the different types of light bulb you have investigated?

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Before you try to answer Inquiry 2, have a go at answering supporting questions 2A, 2B, 2C, 2D, 2E and 3F on the next two pages.

You can research information on these questions by using the resources listed on page 7.

Which types of light bulbs are most efficient and environmentally friendly and why?

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Supporting question 2A

How could you measure the efficiency of a light bulb?

Supporting question 2B

Which type of light bulb do you think is most efficient and why?

Supporting question 2C

Which type of light bulb produces light most like natural sunlight and why?

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Supporting question 2D

Which type of light bulbs are the cheapest to produce and why?

Supporting question 2E

Which type of light bulbs are the most expensive to produce and why?

Supporting question 2F

Which factors do you need to consider when disposing of light bulbs?

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🕒 Resources

Light, Light Bulbs and the Electromagnetic Spectrum

(<http://www.schoolgen.co.nz/ee/e4.factsheet.aspx>)

This factsheet provides essential background information and a glossary of terms.

Websites

These websites provide access to easy-to-read technical information as a start point for your research.

- **Level** provides information about energy efficient lamps
<http://www.level.org.nz/energy/artificial-lighting/>
- **How Stuff Works** offers information about fluorescent lamps
<http://home.howstuffworks.com/fluorescent-lamp.htm>
- **Wikipedia** provides information about compact fluorescent lamps
http://en.wikipedia.org/wiki/Compact_fluorescent_lamp
- **Smarterhomes** has information about lightning and offers energy saving tips
<http://www.smarterhomes.org.nz/energy/lighting>

Packaging information

You could obtain information from the packaging on a range of light bulbs.