

<b>Topic</b>	Electrical power	<b>Level</b>	For students aged 11-16
<b>Outcomes</b>	<p>Students are able to understand the term power</p> <p>Students can calculate the power for different devices</p> <p>Students can calculate the cost of running different devices</p> <p>Students can explain and understand why different devices have different efficiencies</p>		



Which light is most powerful and why?

Put these lights in order of increasing power.



**To find out the power of each light, we measured how much energy was transferred by each device in one minute. The results are in the table below.**

1. Calculate the power of each device by completing the table.
2. Were your predictions correct?
3. Which light do you think will be most expensive to use in your home? Explain.
4. Energy usage is measured in **kilowatt** hours (kWh). A kWh costs 10p in the UK. Calculate the cost of running each light for 24 hours and complete the table. Use the unit of kWh to help you do the maths.

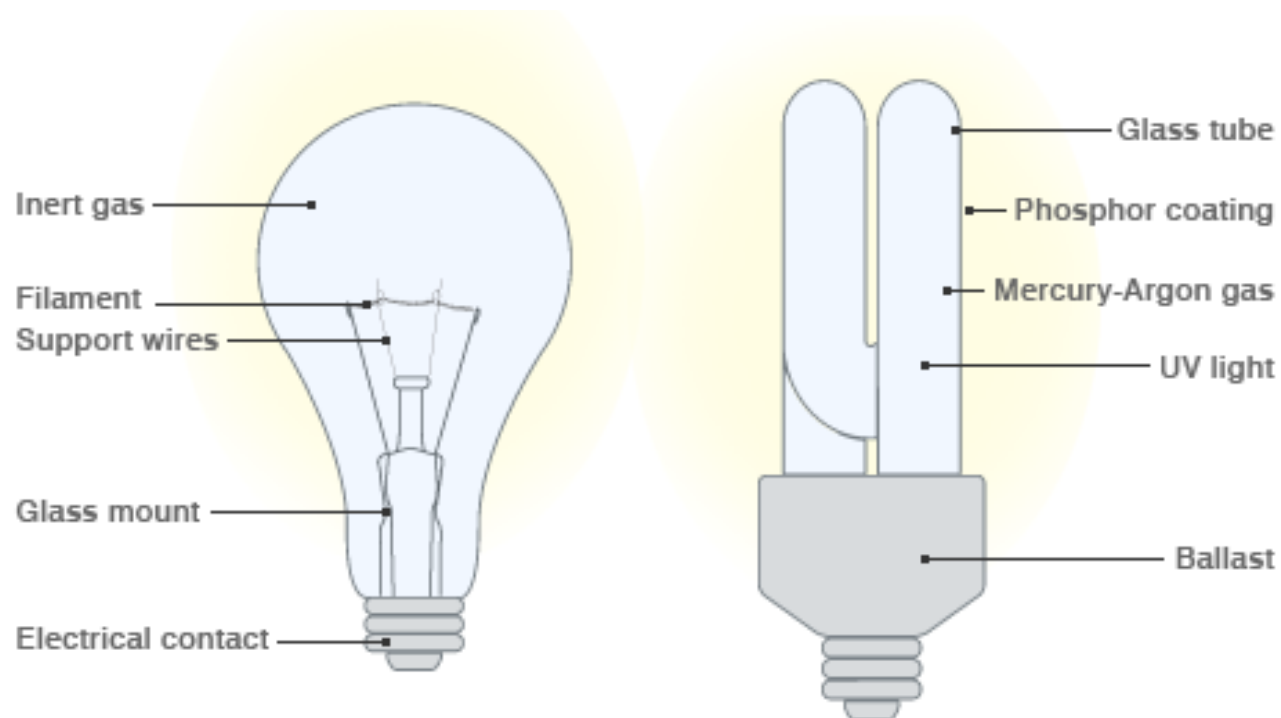
Light	Energy transferred (J)	Time (s)	Power (joules per second or Watts)	Cost of running device for 24 hours (£)
LED Night lamp	240	60		
Christmas tree	2400	60		
Candle	4620	60		
Spot light	45000	60		
Lighthouse	420000	60		
Neon light		60	90	
Lava lamp	2400		40	

Power ratings of different devices.

Light	Power (joule per second or watts)
LED night light	4
Christmas tree	40
Candle	77
Spot light	750
Lighthouse	7000
Neon light	90
Lava lamp	40

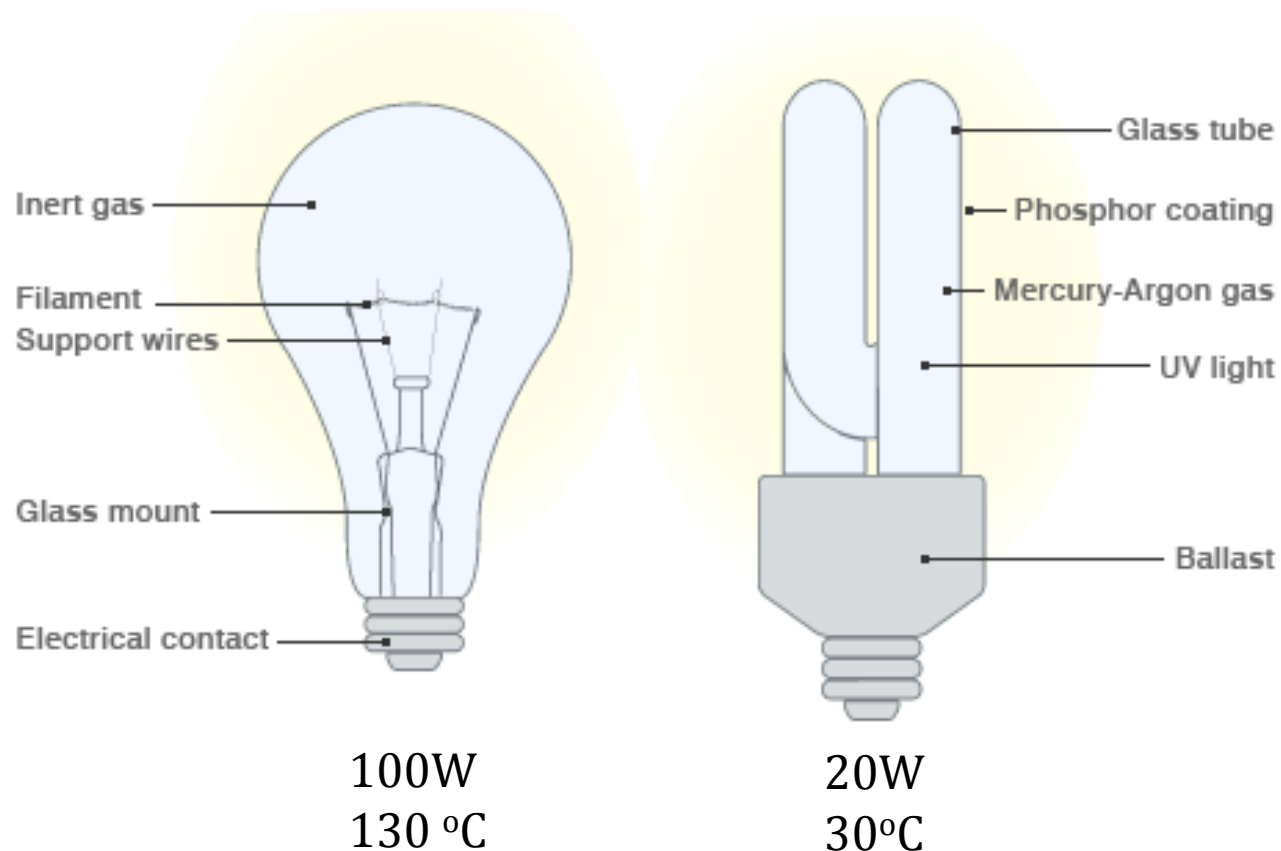
These two bulbs produce the same amount of light but have different power ratings. How is this possible? We are going to investigate this problem. We will measure the surface temperature of each bulb after it has been switched on for 30 minutes.

So, looking at the results can you explain why these two bulbs produce the same amount of light despite having different power ratings?

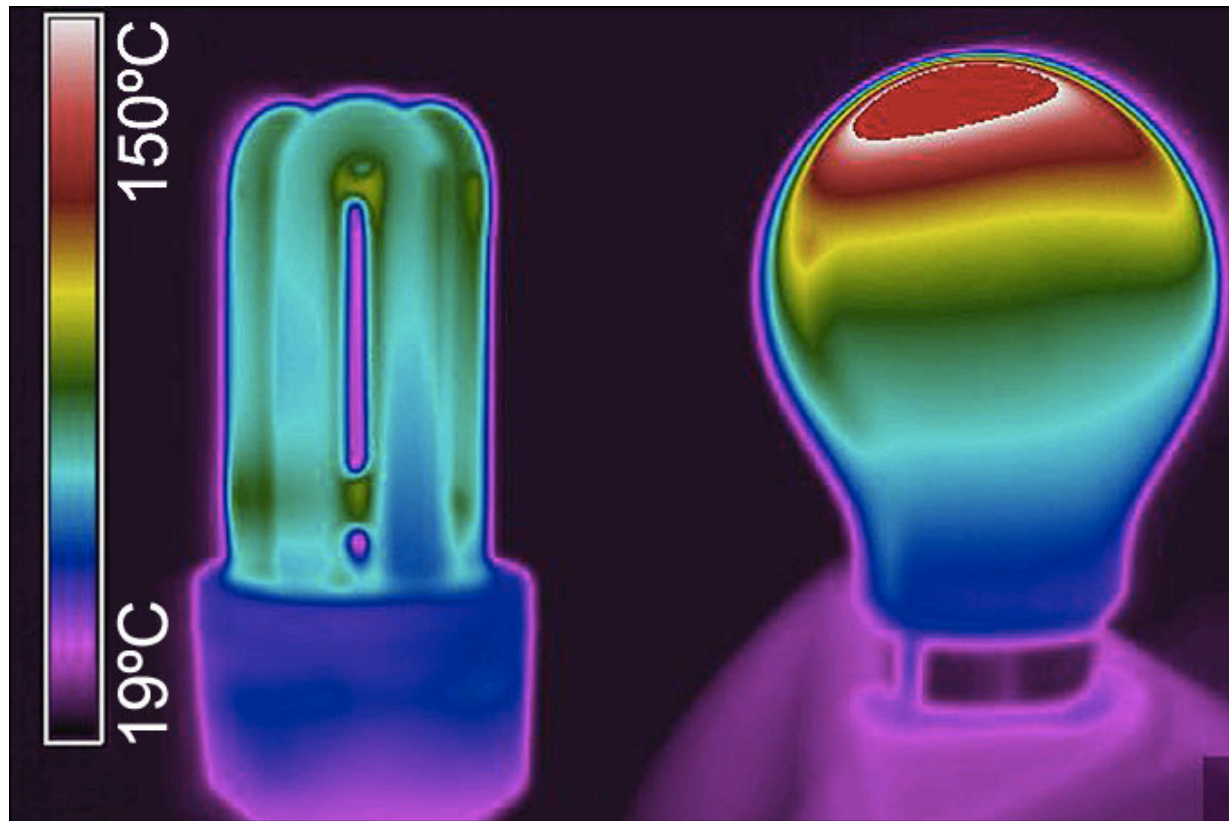


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Now, arrange all the lights in order of increasing efficiency.



Source: <http://www.thesun.co.uk/sol/homepage/features/2262394/The-light-switch.html>