

Light Bulb Challenge

Part 1: What's in your home?

Count the total number of light bulbs in your home _____



How can you tell if a bulb is incandescent, CFL or LED? This picture shows the basic differences between bulbs. Note that LEDs often look like incandescents, except that they have a solid plastic collar near the base instead of being all glass. Incandescents will usually be 40 watts or higher.

Count how many of each type of bulb is in your home:

Type of bulb	# in your home
Incandescent	
<u>CFL (Compact Fluorescent Light)</u>	
LED (Light Emitting Diode)	
Unknown	

How to find the watts

Do you know where to look? Turn off the bulb. Incandescents usually have text on top of the bulb that includes the watts. CFLs and LEDs usually have the same text near the bottom of the bulb, on the plastic collar. If you can't see the bulb, or if there's no text on it, assume that it is 60 watts for an incandescent, 14 for a CFL and 7 for an LED.



Part 2: Exploring the Cost of Bulbs

- Fill in the chart below with information about 2 incandescent bulbs in your home. If you do not have any incandescent bulbs, fill in as though you have a 60W and a 75W Incandescent bulb.

Cost to Operate An Incandescent Bulb	Example	Bulb #1	Bulb #2
Where are the incandescent bulbs? Write the room and location	<i>Kitchen ceiling lamp</i>		
How many watts is the bulb? See image on pg 3 to find the watts on a bulb. Use 60 and 75 watts if unknown	<i>60 Watts</i>		
How many hours per day is the bulb on? Estimate or ask a family member to help you	<i>3 hours</i>		
How many days per year is the bulb on? Estimate or ask a family member to help you	<i>365 days/year</i>		
How many hours per year is the bulb used? Multiply hours per day X days per year	<i>3 hours x 365 days = 1,095 hours/year</i>		
How many watts per year does it use? Multiply watts X hours per year	<i>60 X 1,095 = 65,700 watts/ year</i>		
How many kilowatts (kWh) per year does it use? ¹ Divide watts per year by 1000	<i>65,700 watts ÷ 1000 = 65.7 kWh/yr</i>		
How much money do you pay per year to use this bulb? Multiply kWh per year X \$0.17 ²	<i>65.7 kWh X 0.17/kWh = \$11.17/year</i>		
What are the Carbon Dioxide emissions associated with using this bulb per year ? Multiply kWh per year x 1.2 pounds (lbs)	<i>65.7 kWh/year X 1.2 lbs CO₂/year = 78.84 lbs CO₂/year</i>		

¹ Most electric bills measure electricity in kilowatt hours (kWh).

² Current cost per kWh

2. Fill in the chart below with information about 2 LED bulbs in your home. If you do not have any LED bulbs, fill in as though you have a 9W and a 7W LED bulb.

Cost to Operate an LED Bulb	Example	Bulb #1	Bulb #2
Where are the LED bulbs? Write the room and location	<i>Kitchen ceiling lamp</i>		
Watts of the bulb	<i>9 watts</i>		
How many hours per day is the bulb on? Estimate or ask a family member to help you	<i>3 hours</i>		
How many days per year is the bulb on? Estimate or ask a family member to help you	<i>365 days/year</i>		
How many hours per year is the bulb used? Multiply hours per day X days per year	<i>3 hours x 365 days = 1,095 hours/year</i>		
How many watts per year does it use? Multiply watts X hours per year	<i>9w x 1,095 = 9,855 wh/ year</i>		
How much electricity in kWh per year does the LED bulb use? Divide watts per year by 1000	<i>9,855 ÷ 1,000 = 9.85 kWh/yr</i>		
How much money do you pay per year to use this bulb? Multiply kWh per year X \$0.17	<i>9.85 x \$0.17 = \$1.67</i>		
What are the Carbon Dioxide emissions associated with using this bulb per year ? Multiply kWh per year x 1.2 pounds (lbs)	<i>9.85 kWh/year X 1.2 lbs CO₂/year = 11.82 lbs CO₂/year</i>		

1. How much money does it cost to light both incandescent bulbs for a year?
2. How much money does it cost to light both of the LED bulbs for a year?
3. How much money is saved by using both LED bulbs instead of Incandescent bulbs?

4. How much less Carbon Dioxide is emitted by using one LED bulb instead of Incandescent?
5. Both?

**For a visual comparing bulb types and CO₂, check out [this slide](#) in present mode.*

Optional extension:

Feeling the heat from different bulbs

Turn on an incandescent light bulb for 5 minutes. Carefully place your hand near, but NOT ON the bulb after it has been lit for 5 minutes. If you have a non-touch thermometer, use it to measure the temperature and record your observation.

1. What do you feel from the incandescent?

2. Now, find a different type of light bulb (CFL or LED) and repeat the same procedure. What do you feel from the CFL or LED?

3. Why do you think there is a difference?

Optional extension:

Battle of the Bulbs

Watch [this video](#) to see another example of the differences between Incandescent and LED bulbs. We attached each bulb type to a bicycle generator, and had two volunteers pedal to light up the bulbs. Watch to see the difference in how much energy each volunteer had to use.

Part 3: Take Action

What would you recommend to your family to reduce the environmental impacts of lighting use in your home? What is your reasoning for these recommendations?

Extend Your Reach

- Share your lighting recommendations on our social media!
 - [facebook.com/NHenergyed](https://www.facebook.com/NHenergyed) or [facebook.com/VTEnergyEducation](https://www.facebook.com/VTEnergyEducation)
 - [instagram.com/vtenergyed](https://www.instagram.com/vtenergyed) or [instagram.com/nhenergyed](https://www.instagram.com/nhenergyed)

- In NH, check out our NHSaves Education Challenge: a literacy challenge where you can create and submit individual or group projects with a written component answering questions about energy and energy efficiency. Prizes for winners!
 - www.nheep.org/nhsaves-education-challenge

For next steps and ideas on how to take action to reduce emissions from electricity in your school, community, or state, check out our website.

Vermont: <https://veep.org/poster-2020>

New Hampshire: <https://nheep.org/poster-2020-21>

For more information on how to reduce electricity use and costs in your home, check out [Efficiency Vermont](#) or [NHSaves](#).