**Light Bulb Conundrum**

I recently went to the store to purchase light bulbs. The options were a bit overwhelming. Do I buy standard bulbs (incandescent) or energy efficient ones? If I buy energy efficient ones, which kind: LED or Compact Fluorescent (CFL)?

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Money is a bit tight right now; I can’t spend extra money on every bulb in my house—there’s like 60 of them—just to make myself feel like I’m doing my part to combat climate change. *Based on cost-effectiveness, make a decision about which bulb you think I should buy.*

Background info: Yearly costs for all light bulbs are based off the same ideal usage of 3 hours per day with electricity costing 11cents per kilowatt-hour.

Below are the best-looking options to me from Home Depot’s website. I arranged the categories in alphabetical order. Just because.

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| Compact Fluorescent (CFL) |  |  |
| http://www.homedepot.com/catalog/productImages/1000/4f/4fee8c20-40cc-4d21-8038-e5fdfcc274bd_1000.jpgGE Reveal 15-Watt (60W) Bright from the Start CFL Light Bulb  (2-Pack) | * Estimated yearly energy cost: $1.81 * Average Life: 8,000 hours (7.3 years) | $13.97 / package |
| http://www.homedepot.com/catalog/productImages/1000/9f/9fbf21b9-2f2c-44a9-9428-608e60c76550_1000.jpgEcoSmart 14-Watt (60W) A19 Bright White CFL Light Bulb (4-Pack) | * Estimated yearly energy cost: $1.69 * Average Life: 8,000 hours (7.3 years) | $15.94 / package |

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| **Incandescent:** |  |  |
| http://www.homedepot.com/catalog/productImages/1000/22/22786c35-797c-4f40-905a-e7b03f782797_1000.jpg  Philips 60-Watt Household Incandescent Light Bulb  (4-Pack) | * Estimated Yearly Energy Cost: $7.23 * Average Life: 1,000 hours (0.9 years) | $1.47 / package |
| http://www.homedepot.com/catalog/productImages/1000/fe/fe7f3ad1-356f-448a-b801-a271ad36e949_1000.jpg  GE Double Life 60-Watt A19 Soft White General Purpose Incandescent Light Bulb  (6-Pack) | * Estimated Yearly Energy Cost: $7.23 * Average life: 2,000 hours (1.8 years) | $3.97 / package |

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| **Light-Emitting Diode (LED)** |  |  |
| http://www.homedepot.com/catalog/productImages/1000/24/24ddba23-ab14-41d4-8839-3633e6d0b5c2_1000.jpgCree 9.5-Watt (60W) Soft White (2700k) Dimmable LED Light Bulb | * Estimated yearly energy cost: $1.14 * Average Life: 25,000 hours (22.8 years) | $12.97 / each |
| http://www.homedepot.com/catalog/productImages/1000/79/79dd44ab-5fc2-4725-bae8-74c141ac3f63_1000.jpgPhilips 11-Watt (60W) A19 Household Soft White (2700K) Dimmable LED Light Bulb  (2-Pack) | * Estimated yearly energy cost: $1.32 * Average Life: 25,000 hours (22.8 years) | $29.94 / package |

Directions:

1. Find the “best” bulb in each category. Be sure to include an explanation I can use to convince my wife—math and all.

Compact Fluorescent (CFL)

Incandescent

Light-Emitting Diode (LED)

1. Depending on which incandescent you chose, you may have to buy a new bulb every 0.9 years. That’s very different than buying a light bulb every 22.8 years (crazy LEDs). How do you suggest tackling the problem of having to buy new bulbs when comparing between the categories?
2. Now that we know the best bulb in each category and we have an idea about how to include buying new bulbs in our decision-making process, let’s take the next step and compare the best bulbs with each other. Write up a plan of attack for how you might go about comparing the bulbs.
3. Now let’s work the plan! Which is the most cost-effective bulb in the long run? Be sure to show your reasoning and thought process.
4. What if I only plan to live in my house for 3 years, would your recommendation for the “best” bulb change? Why or why not?
5. Is there a magic number of years (or hours of usage) I could plan to stay in my house to make each type of bulb the cheapest? Try to find one.
   1. How many years do you need to use the bulb(s) to make Compact Fluorescent bulbs (CFLs) the cheapest?
   2. How many years do you need to use the bulb(s) to make Incandescent bulbs the cheapest?
   3. How many years do you need to use the bulb(s) to make Light Emitting Diodes (LEDs) the cheapest?