My First Apartment

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**My First Apartment**

Context: You’re ready! You have made the decision that the time has come to move out on your own. You have found a nice 2 ½ apartment in a safe and convenient neighbourhood and you have just signed your very first lease.

Your apartment consists of a large room that will be your bedroom and your living room, a separate kitchen and a small bathroom with a shower. The entire building is heated by a central furnace, so the heating costs are included in your rent. The kitchen is furnished with an older fridge and stove and your apartment has its own electric water heater.

In conversation with your parents about the many things you will have to think about living on your own, the concept of energy came up and now you are a little concerned about how much you will have to spend on electricity

Part 1 - Your Energy Consumption

a) List all the appliances and devices you will need in your apartment. You must include a water heater, lighting, fridge, stove, TV and computer. All other appliances and devices are your choice (chargers for phone/Ipod, DVD player, microwave, hair dryer, sound system, cordless phone, can opener, toaster, kettle, etc).

|  |  |  |
| --- | --- | --- |
| Living Room/Bedroom | Kitchen | Bathroom |
|  |  |  |

b) Fill out the table below for all the appliances and devices in your apartment.

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Power Rating (W)** | **Average time used** **per day in seconds (S)** | *E*(J) = *P*(W)×*t*(s)**Total Joules (J) used per day** |
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Typical Power Ratings for Home Appliances

Note: All appliances that have a clock consume 1W per hour even when turned off.

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| **Appliance** | **Watts**  | **Appliance** | **Watts** |
| **Refrigerator/Freezer (15 hrs per day average runtime** | **500 W** | **Water Heater** | **3500 (3 hrs per day runtime typical)** |
| **Electric Stove element (depending on size and setting)** | **150-1500** | **Electric Oven** | **2400** |
| **Incandescent Light bulbs** | **Fluorescent or compact fluorescent light bulbs**  | **Televisions** | **For an average model** |
| **100W** | **30W**  | **26” LCD** | **50 W** |
| **75W** | **20W**  | **32” LCD** | **70 W** |
| **60W** | **16W**  | **40” LCD** | **80 W** |
| **40W** | **11W**  | **42” plasma** | **115 W** |
| Air Conditioner | 1000   | **46” LCD** | **100 W** |
| Blender | 300  | **52” plasma** | **152 W** |
| Blow Dryer (Hair dryer) | 1000 - 1500  | **For old TVs (CRT)** | **Add 50 W to same size LCD** |
| CD Player | 15 - 30  | Engine BlockHeater | 150 - 1000  |
| Ceiling Fan | 10 - 50  | Portable Heater | 1500  |
| Charger (cell phone or other) | 3 (0.5W when no load) | Waterbed Heater | 400  |
| *Laptop* | 20 - 75 (8-12 on standby) | Iron | 1000  |
| *Desktop Computer* | 80 – 200 (10-15 on standby)  | Microwave | 600 - 1500  |
| *Printer* | 100  | Popcorn Popper | 250  |
| Coffee Maker | 800  | Satellite Dish | 30  |
| Clock Radio | 1  | Shaver | 15  |
| Dishwasher | 1200 - 1500  | Stereo | 10 - 30  |
| Dryer (Clothes) | 4000   | Table Fan | 10 - 25  |
| DVD player | 20  | Toaster | 800 - 1500  |
| Electric Blanket | 200 | Frying Pan | 1200  |
| Electric Clock | 1  | Conventional Chest Freezer  | 445 |

c) Use: <http://www.rapidtables.com/convert/energy/Joule_to_kWh.htm>

to convert Joules of energy to Kilowatt-hours kWh

|  |  |  |
| --- | --- | --- |
| **Total Joules of Energy used per day**Total:\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **kWh of Energy used per day** (One joule is equal to 2.777778⋅10-7 kilowatt-hours)Total:\_\_\_\_\_\_\_\_\_\_\_\_\_ | **kWh of energy used per year** (total kWh x 365 days)Total:\_\_\_\_\_\_\_\_\_\_\_\_ |

\*\*\*calculate the energy each device consumes and how much it costs (**base your calculations on $0.12/kWh**). Organize your work as shown below. Be sure to show all formulas and calculations.

d) How much will it cost you per year for your electricity consumption? (kWh used per year x $0.12)

e) What could you do to reduce your consumption? Explain.

Part 2

Since the appliances in your apartment are all older, less energy efficient models, your electricity consumption (and bill) is higher than it needs to be.

Write a letter to your landlord to convince him/her to replace your appliances with newer, more efficient models. Be sure to use a variety of arguments in your letter (economic, environmental, social, ethical, technological). Remember that your landlord may not be as knowledgeable as you are in this area.

List your major arguments here:

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Part 3– Electric Circuits

In this section, you are required to “wire” a prototype of one of the rooms in your apartment.

a) Will you choose a series or parallel circuit? Explain.

b) Draw a circuit diagram to represent your electrical wiring in your room.

 