

**Chapter
2****Performance Task** (continued)**Designing for Electricity**

How many watts do the electrical appliances in your home use? What would happen if all of your appliances were on at the same time? Designers use inequalities to calculate the electrical needs of a home. What information about watts would you need to calculate the electrical load when planning electrical circuits for your dream home?

1. A watt is the basic unit measurement of electrical power. Suppose you are running the air conditioner, the washing machine, the clothing dryer, two computers, four light bulbs, the refrigerator, and two televisions. Use the chart at the right and calculate how much wattage you might need in this situation. Show your work and write an inequality that shows what the available wattage must be greater than.

Appliances	Average Watts
Coffee maker	1100
Refrigerator	600
Vacuum	1000
Toaster	1150
Microwave	1800
Clothing dryer	5000
Computer	70
Television	240
Stereo	80
Radio	40
Hair dryer	1300
Air conditioner	3500
Light bulbs	60
Dishwasher	1200
Washing machine	500

2. Create three scenarios for the appliances you might have running in your home at one time. Describe them in words and with an inequality. Use the chart above to select the average amount of watts.

Scenario 1:

Scenario 2:

Scenario 3:

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3. Given this load inequality, describe what appliances could be running, and calculate how much more electricity you would have available to use. Provide an example of other appliances that could be running without overtaxing this system.

$$1100 + 600 + 1150 + 1800 + 5000 + 500 + 8(60) + 70 + 240 \leq 18,000$$

4. Refer to your scenarios in Exercise 2. Increase the total average wattage in each situation by 40%. The additional 40% compensates for the surge wattage required at the startup of an appliance. Express your answer as an inequality.

Scenario 1:

Scenario 2:

Scenario 3:

5. Use the information you created from your three scenarios to produce an inequality to represent the maximum number of watts you might need to have available at any given time in your dream home. Explain how you arrived at your decision.

