Connecting Electrical Consumption to Coal & Carbon Dioxide Worksheet Name: _____

1. Use a Kill a Watt device to investigate electricity consumption of appliances around your home.

2. Pick one item to investigate and complete the following table using a data from the Kill a Watt device and a calculator:

	Item Name:	
A	Energy Consumption Reading (Kilowatt Hour or kWh) from Kill a Watt device	kWh
B	Elapsed Time Recorded by Kill a Watt device (press "KWH/Hour" button to get to clock)	Hours
C	Average Hourly Consumption (Divide Answer for A / Answer for B)	kWh/hr
D	Average Annual Energy Consumption (Answer for C x # hours used per day X 365)	kWh
E	Price of a KWh (Click here to find current rates for Duke Energy) *Duke Energy Carolinas, November-June* *Duke Energy Progress, November-June*	 $0.09296 per kWh $0.09650 per kWh
F	Annual Operating Cost (Answer for D x E)	$ /year

3. Visit EPA's *Power Profiler* at http://www.epa.gov/energy/power-profiler and enter your zip code to determine what energy sources ("fuel mix") are used for electricity generation by your energy provider. *Depending on your zip code, you may be asked to indicate your utility.* What two fuels are responsible for most of the electricity generated by your provider? _____ (%) & _____ (%)

4. You'll see from the graph that in the SERC Virginia/Carolina for 2020, **coal provided ~19% of the energy** used to generate the electricity. In the Southeastern US, approximately 1 pound of coal is required to generate 1 kWh of electricity*. Calculate the amount of coal required to power the item above for one year.

G	Pounds of coal used (Answer for D from above x .19)	lbs coal/year

5. Calculate the amount of emissions* that result from burning this coal by completing the table below.

H	Pounds of CO_2 emitted/year (Answer G from above x 1.4lb)	lbs CO_2/year
I	Pounds of SO_2 emitted (Answer G from above x 0.006lb)	lbs SO_2/year
J	Pounds of NO_x emitted (Answer G from above x 0.003lb)	lbs NO_x/year

*Source: *Kilowatt Ours* Companions Curriculum

6. The second graph of EPA's *Power Profiler* shows the air emissions associated with this fuel mix profile.
   a. Describe your observations as you compare regional and national CO_2, SO_2, and NO_x emissions from power plants.

   b. How do these emissions impact the environment and human health?

   c. What other pollutants of concern are emitted from coal-burning power plants?

7. List ways to reduce the amount of electricity consumed by this item (e.g., only plug it in when you need it).