Name _____ Date _____

Science/ Technology/Society

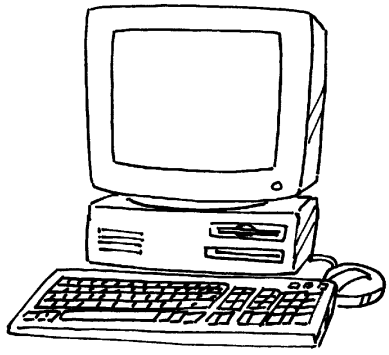
Use with Lesson 3.

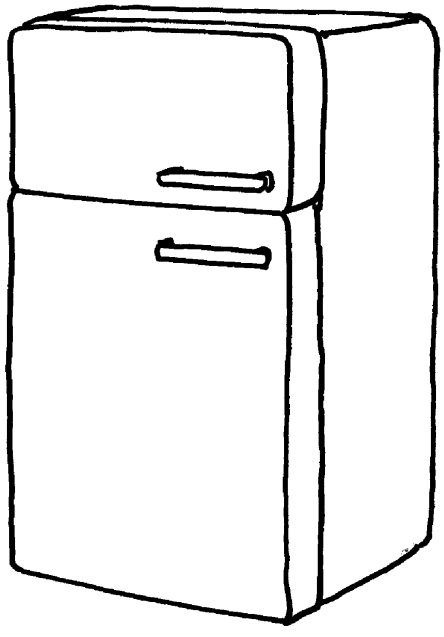
Electromagnetic fields

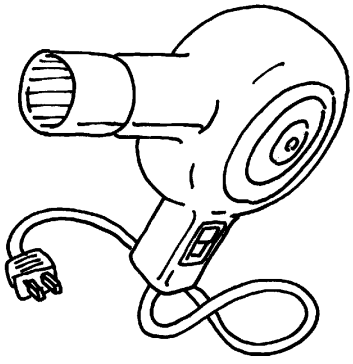
Making the Connection: Scientists have been studying the possible effects on health of electromagnetic fields (EMFs), the invisible lines of force that surround electrical devices.

EMFs are all around us and are especially concentrated near high-voltage power lines and cables, computers, and other electric appliances. Several studies have shown that EMFs are dangerous to humans and other animals. They have recorded increasing numbers of childhood leukemia cases in areas with a concentration of high-voltage power lines. Is EMF the cause? In a German study of 100 rats exposed to constant EMFs, 84 rats developed a brain tumor or some form of cancer. Another study, which exposed rats to EMFs every other hour, showed a much lower number of rats with cancer. Does that mean that length of exposure time is a factor? The rats in both studies were exposed to stronger EMFs than humans meet in most business and industrial environments. Does that mean that high levels of exposure are the cause of their cancer?

Scientists are working to answer these and other questions.







Name _____ Date _____

EMFs are measured in units called *milligauss*. Most scientists agree that 10 milligauss is a safe level of exposure for humans. The table shows the median EMF for common electrical appliances. The fields are measured in milligauss at four distances from the source.

Appliance	**6 inches**	**1 foot**	**2 feet**	**4 feet**
Hair dryer	300	1	-	-
Dishwasher	20	10	2	-
Microwave	200	10	4	2
Refrigerator	2	2	1	-
Electric Range	30	8	2	-
Toaster	10	3	-	-
Tape player	1	-	-	-
Color TV	-	20	8	4
Washing machine	20	7	1	-
Computer monitor	14	5	2	-
Electric pencil sharpener	200	70	20	2

Answer these questions:

1. Which appliance has the strongest magnetic field at 6 inches? At 2 feet?

_____

2. Which appliance has the weakest magnetic field at 6 inches? At 2 feet?

_____

3. What is most surprising to you about the information in the table?

_____

_____

_____

4. Which of the appliances do you use in your home?

_____

5. How does distance affect magnetic fields?

_____

_____

_____

_____