The Saint Louis Science Center's Breakthrough Gallery features new developments in scientific research happening today. DVDs and activity guides are available on a variety of topics. Email mwalsh@slsc.org for more information. This guide accompanies the DVD "Sleep Study" which features scientists at Washington University, St. Louis who are the first to show that fruit flies have periods of inactivity similar to sleep. This breakthrough research could eventually help us understand our sleep cycle and provide relief to many with sleep problems. Their research shows that both fruit flies and humans: sleep at night, sleep longer when they are young and less when they are older, and are stimulated by caffeine and made sleepy by antihistamines. Eighty percent of the genes in the fruit fly are common with genes found in humans.

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SWEET DREAMS

Why Flies?

You will need:
2-liter plastic bottle, scissors, masking tape, film canister without top, piece of fruit to fit in canister, plastic lid, paper, pencil, adult to puncture a hole in the bottle top

- **Make a home for fruit flies.** First, take the bottle cap off. Ask an adult to poke a 3-4 mm. hole in the cap and put it back on.
- Next, cut the top third off the bottle.
- Place the plastic lid in the bottom of the bottle. Place the fruit inside the canister and the canister on the plastic lid.
- Turn the top third of the bottle upside down and place it in the bottle with the cone shape facing downward. Seal the two parts of your fly home together with tape.
- The life cycle of a fruit fly is two weeks. Record your observations as the flies grow.
- What might happen if you put caffeinated soda in your film canister?

Ho Hum
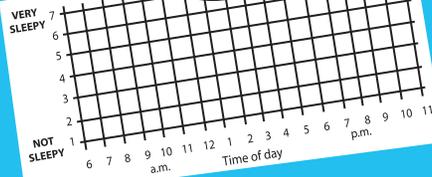
You will need:
graph paper, pencil, one sunny day, one dark and rainy day

- **Record your sleepiness cycle.** Start by transferring the information in the graph shown with this activity onto your graph paper.
- Take the graph paper with you throughout your day. Each hour, mark on the graph how sleepy you are.
- Continue this study for a few days. What do you notice?
- Are your results on the weekend different from those during the week?
- How does a sunny day compare to a rainy day?
- Ask the adults you know what time of day they normally have a cup of coffee. What time of day do you like to drink a caffeinated soda?

Catching ZZZs
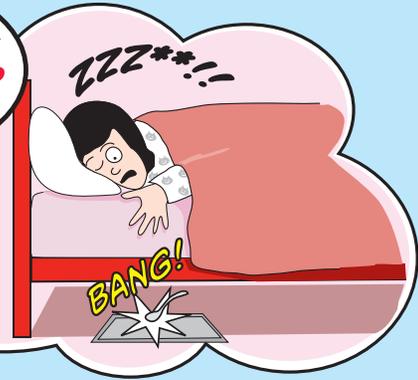
You will need:
sleeping animals, paper, pencil, metal spoon, cookie sheet

- **Keep an eye on sleeping people and pets.** By looking closely at someone's closed eyes, you can observe REM, rapid eye movement sleep.
- REM doesn't occur all the time you are sleeping, so it may take several observations for you to see it. Babies have more REM time than adults. The function of REM is a mystery.
- Tired from all your observation work? Now try an experiment on yourself.
- Place a cookie sheet next to your bed. Hold a metal spoon in your hand, above the cookie sheet, while you are falling asleep. Record the time when you lie down.
- "Bang!" The spoon falls and wakes you up. Check the clock. You now know your sleep latency time. For most people that's about 15 – 20 minutes, much shorter than that and you are too tired, or sleep deprived.