Investigation #4 - Squid Races

Objective:

Students imitate squid propulsion using a balloon and experience Newton's third law: for every action there is an equal and opposite reaction. Various anatomical designs are tested and analyzed. Can be used to tie into several other physics concepts and calculations

Materials:

- balloons
- markers
- fishing line or string.
- drinking straws
- tape
- paper clips
- misc. cardboard, paper, plastic and other scraps of material
- stopwatches
- metric ruler or tape measure } optional for math extension
- graph paper

Procedures: (one squid balloon for each team of students)

1. Blow up a balloon of your choice but do not tie it. Twist the end of the balloon around a small paper clip to keep the air from escaping until the race begins.

2. Tape fins, stabilizers, tentacles and any other body features decided upon by your team to result in the squid that will move the fastest and travel the greatest distance. Tape drinking straw pieces to the dorsal (top) of the squid to act as guides that hold the contest string. Decorate the balloon to look like a squid. (Note: The open end of the balloon must be the rear of the squid!)

3. Stretch two strings or fishing lines across the room and tie both ends to the backs of the chairs or tape them to a wall.

4. Get ready to race two squids head-to-head, one on each string, by threading the string through the drinking straw guides. Assign a "timer" with a stopwatch for each squid.

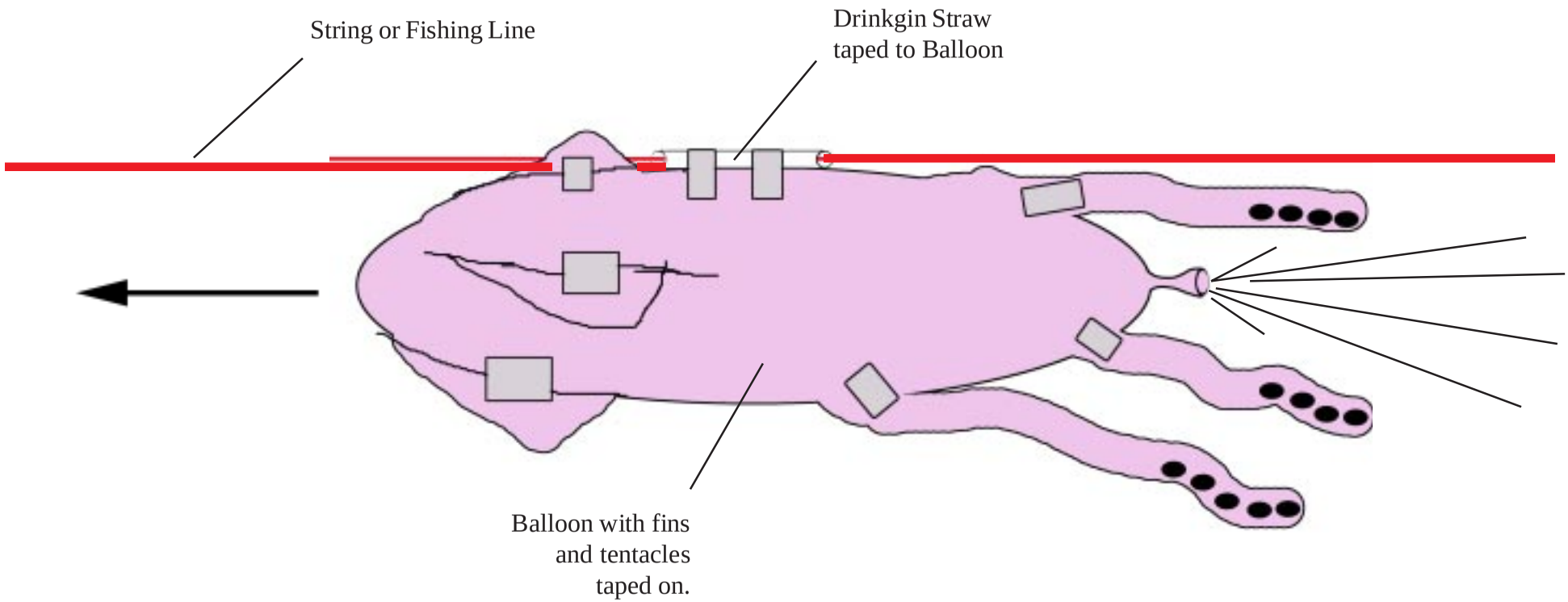
5. When ready, release the paper clips and let the squids travel down the string. Time the travel, then use a metric measuring device and record the total distance travelled.

Discussion:

A. What is the propulsion system on a squid?
B. What caused the squid balloon to move forward?
C. Consider the balloon that won the race. What body modifications gave this squid the winning edge?
D. Draw a diagram of a squid and label its body parts.
E. How do the actual squid body features compare to those of the winning balloon?

Extension:

F. Calculate the speed of each squid using the time and distance. (Speed = distance/time)
G. Make a bar graph comparing the speed of each squid in the class.
E. What can we learn from this graph?



Exmple: Balloon Decorated as a Squid