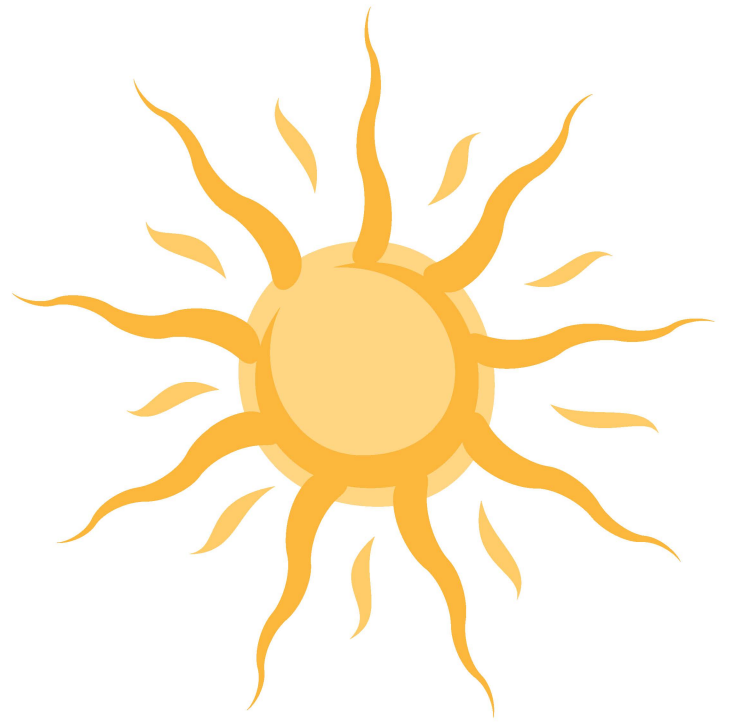


The Educator's Guide to Marine Debris

Southeast and Gulf of Mexico

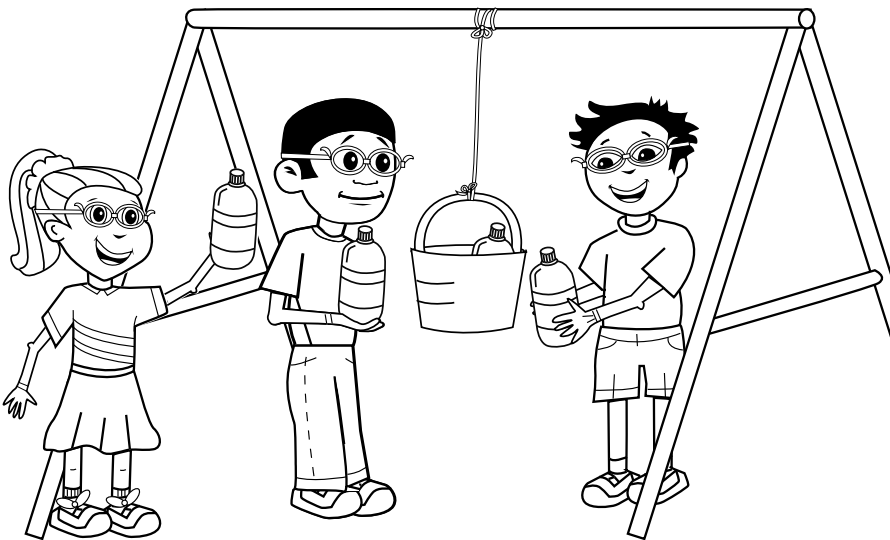




Activity | MONOFILAMENT MAYHEM

Fishing line today is made of monofilament plastic. It is strong, yet stretchy. Different diameter line is designed to have specific breaking points measured in pounds. In theory, a four-pound test line will break when four pounds of force are applied, and a 40-pound test line will break under 40 pounds of force. Lighter weight line—approximately a four-to-eight-pound test—is used when fishing for small fish. For big fish, like marlin or tuna, heavier tackle and a heavy weight—a 40 to 80-pound test line—is chosen.

Monofilament fishing line can stretch before it breaks. Since no one likes losing gear, fishing enthusiasts must know what strength of line to use, based on the type of fish catch that is desired. However, the same qualities that make monofilament line so good for fishing also make it harmful when tossed into the marine environment.



PROCEDURE

Note: If you do not have a fish scale, then you can use the fact that one liter of water weighs 1,000 grams or 2.2 pounds. You may need 10 or more one-liter plastic bottles.) Fill each one-liter plastic bottle with water and cap the bottle. If you are able to do this outside, then there is no need for the bottles of water. Just measure and pour water into the bucket each time.

If a fish weight scale is available:

1. Tie the bucket to the fish weight scale using a four-foot length of one of the sample monofilament fishing lines. Use Palomar Knot figure 1.
2. Tie the other end of the fishing line to a stationary bar or tripod (if done outside: tie to the crossbar of a swing set).
3. Record the weight of the empty bucket.
4. Add water to the bucket until the line breaks. Record the weight from the scale.
5. Repeat your experiment two more times and record the results. Compute the average for the amount of water that was needed to break the line.
6. Repeat each step above with the other weight fishing line and record your results.

PURPOSE

To compare the breaking points of several weights of fishing line.

OBJECTIVES

The students will:

- Investigate the strength of monofilament fishing line
- Discuss how fishing line and entanglement is a danger to wildlife

MATERIALS

- Safety goggles (The fishing line may snap!)
- Gloves for holding onto the fishing line
- Two strengths of monofilament fishing line. Note: visit a local tackle shop and request at least three line strengths, such as light (4-to-10-pound test weight), medium (12-to-20-pound test weight) line, and heavy (40-to-80-pound test weight)
- A 2 liter plastic bucket
- Something to hang the bucket from (a broom handle, tripod, crossbar, or swing set)
- Ten or more one-liter plastic bottles with caps. (You will need enough to break the strength of line you choose)
- Water
- Optional: Fish weight scale (for sale at fishing tackle shops or online at: www.nextag.com/fishingscale/search.html)
- The type of knot is critical. Palomar knots are best for monofilament line: www.animatednots.com/palomar/index.php. See Figure 1. Record if line breaks at knot or elsewhere.



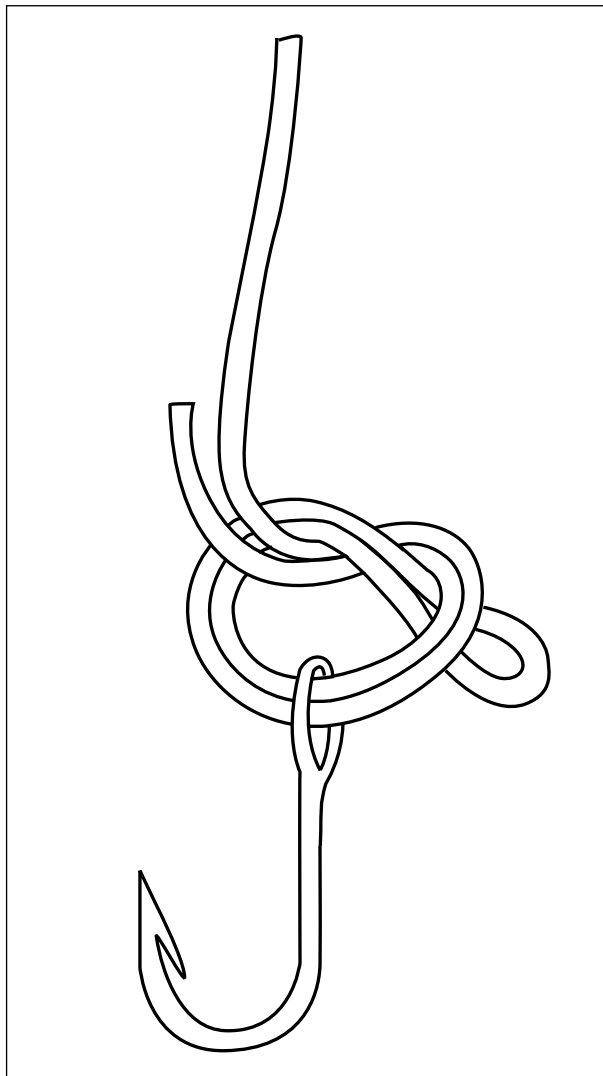
Activity | MONOFILAMENT MAYHEM (continued)

If no fish weight scale is available, then use the metric system to estimate the breaking weight in kilograms (kg).

1. Tie the bucket with the monofilament line to the crossbar.
2. If outside, add water in units of ? liter quantities to the bucket until the line breaks. If inside, put bottles of water in the bucket until line breaks. (One pound is about equal to ? liter of water.)
3. Record the amount of water and its weight at the breaking point.
4. Repeat this test two more times and note an average breaking weight.
5. Repeat each step above with the medium-weight fishing line and record your results.

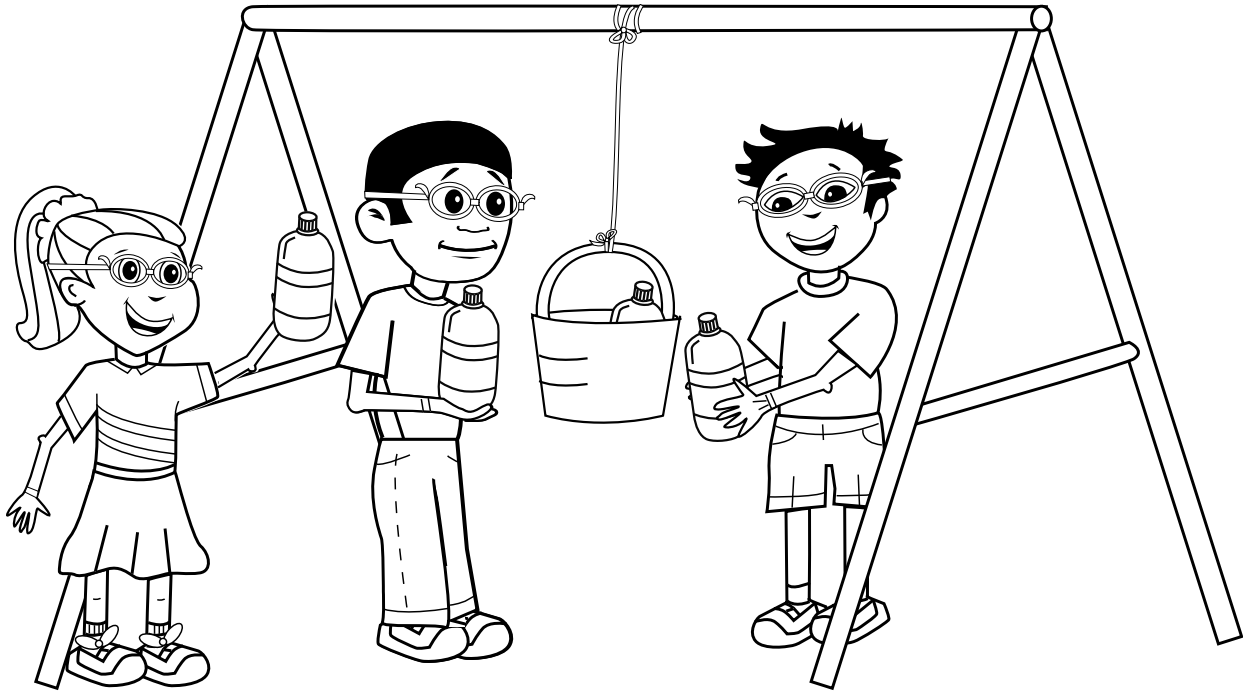
Source: Meta Van Sickle, Ph.D., College of Charleston, and Lundie Spence, Ph.D., COSEE SE

Figure 1.
Palomar knot
attaching line
to hook





Monofilament Mayhem



Student Reporting Table

	Light-weight fishing line	Medium-weight fishing line
Trial One:		
• Amount of water (liters)		
• Weight of water (grams or pounds)		
Trial Two:		
• Amount of water (liters)		
• Weight of water (grams or pounds)		
Trial Three:		
• Amount of water (liters)		
• Weight of water (grams or pounds)		

Math: Record the average weight at which each line breaks.

Light weight line: _____ Medium weight line: _____

Discussion of Observations:

1. Compare the weight of the fishing line to the tested breaking point.

Did the line actually break at the tested weight? _____

2. Where did the line break? Is the knot a factor for breaking?

3. Discuss why different fishing lines are used.

What size fish could you catch with the fishing line strengths that you have tested?

4. Just by pulling on different weight lines with two gloved hands, can you break the line? Do you think an animal can break the line that is wrapped around its beak or flipper? _____

5. Conclusions:

a. Describe what might happen to a dolphin or bird entangle in monofilament fishing line. _____

b. What can be done to prevent fishing line loss and wildlife harm?

“How to tie” website:
<http://www.animatedknots.com/palomar/index.php>

