

Upon Further Reflection

## Materials:

- 2 metal washers
- 1 plane mirror
- o beaker of non-toxic fluid with extra fluid
- clamp stand
- o ruler

## **OBJECT:**

The speed of light changes as it enters a medium causing light rays to bend. This phenomenon, known as refraction, is what causes objects partially immersed in water to appear bent. The amount of bending depends on the refractive index, n, of the material. Your objective is to measure the refractive index of the liquid in the beaker provided.

## **METHOD:**

A liquid's refractive index can be determined from the ratio of the apparent depth of an object, when looking straight down through the liquid, to its true depth n = (real depth)/(apparent depth)

One washer is already in the beaker. Begin by topping off the beaker with the extra fluid.

Measuring the real depth is easy, measuring the apparent depth takes a bit more skill. Place the mirror on the liquid's surface and suspend the second washer, identical to the first, above the mirror. Adjust the distance between the  $2^{nd}$  washer and the mirror until there is no parallax between the washer's image in the mirror and the washer at the bottom of the beaker. The apparent depth is the distance between the  $2^{nd}$  washer and the mirror.

**RULES:** 

• Only the materials provided can be used. ENTER A VALUE WITH THREE SIGNIFICANT FIGURES! SHOW YOUR WORK ON THE BACK!

SCORING: The absolute difference between your measured refractive index and the correct value. The group closest to the correct value wins.

TEAM NAME:

IMPORTANT: ENTER YOUR VALUE USING 3 SIGNIFICANT	
FIGURES.	

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ANSWER