

NAME _____ SECTION _____

Part 1: Finding Area – DO NOW Obtain an index card and draw a 10cm x 10 cm square on the rectangle. The Area of a right solid is the length X the width of the object. Using the length and width determine the Area of your index Card White Solid. **Complete and staple index card to paper**

Area = _____ cm (length) X _____ cm (height)

What are the units? _____

Part II: Finding Volume

The volume of a right solid can be found by multiplying the Area x height.

How would you determine the height of the index card?

If you complete to this point please read the introduction below

Volume = Area cm^2 x height **cm or Length **cm** x Width **cm** x Height **cm****

Find the Volume of the right solid remembering that a measurement must contain a number and a unit (think what is the unit for volume)

INTRODUCTION: Over the next several lab days we will be completing the Shrinky dink lab. There are several parts that you will be completing that will be used to help you practice your **measuring** and **significant figures** skills along with exploring the ideal of the **Law of conservation of Mass**, that matter is neither created nor destroyed. We will also be examining the **physical** and **chemical properties** such as size, shape, **density, intrinsic and extensive properties**, and determining whether the shrinking of the Shrinky dink is a **chemical or physical change**.

- 1.) 1973 - Shrinky Dinks had kids creating artwork on flexible sheets of plastic that would magically shrink down to approximately 1/3 their original size.
- 2.) The sheets of plastic, polystyrene, when manufactured are heated, rolled out into thin sheets and then rapidly cooled so that it can retain its shape.

Part III - Determining the length and width of the plastic sheet

- 1.) Obtain a plastic sheet (you may choose from whatever the available colors are) and one of the sample pictures **PUT YOUR NAME ON THE Plastic in Black Sharpie marker remember that the text will shrink so please make sure that it is large enough to see but small enough to give you room for your picture.**

Data: Using your ruler determine the length and width of your Shrinky Dink remember your units

_____ (length) and _____ width

- 2.) Determine the Area of the Right Solid (reread the pre-lab if you cannot remember the formula)

3.) record the mass of the sheet using one of the balances. Please pay attention to how to mass an object and that your units are in grams.

Measure the height of the plastic using a caliper. A caliper is an instrument that measures internal or external dimensions and distances. This device allows you to take more precise measurements than you could with flat instruments, such as rulers, and has a reading error of only 0.05 mm, which is about 0.0019 inches.

4.) **Data Collection:** When you take the measurement, do not touch the measuring surface of the object to be measured and the measuring surfaces of the digital calipers with your hands for it might result in inaccuracy. You need to keep them clean all the time.

Before measuring the objects, firstly, you need to press the ON/OFF button to switch on power.



Secondly, press the mm/inch button to select the desired unit system as you like. **(Choose the mm version.)**



Finally, press the ZERO buttons to set zero. You may have to zero the caliper a few times it should stay at zero for 5 full seconds.



Step1: Put the lower jaws of the digital caliper on the outside parts of the item.



Step2: Slide it against the item gently until both of the lower jaws tighten against the outside surfaces of the item perfectly.



Step3: Then read the numbers directly from the large LCD display. For example, it is 47.52 mm in the picture as below. Remember that your measurement will be in mm



Your height measurement is in mm if in every 10 mm there is 1 cm determine the height in cm.

Height = _____ mm x _____ =

What is the volume of your right Solid? Show formula and Calculations

DAY 2 – You will be drawing and coloring on the flat side (the non shiny side) of the plastic sheet. Why do you think that you should do this?

5.) Color the picture completely and remember to put your name and section number on the plastic and let the sheet dry. After you complete the coloring and before you wrap your picture please remember to measure the mass of the completed drawing.

Mass of drawing completed:

Mass of Paint:

Mass of right solid – DO NOW Mass vs Weight? Is the mass of your right solid the same or different from its weight?

Foil Wrapping - Take a large piece of Aluminum foil and use it as a folder for your drawing once it has dried

Complete any calculations and label

Table 1: Volume - Pre Colored Sheet

Length (cm)	Width (cm)	Area (cm²)	Height (mm)	Height (cm)	Mass (g)	Volume(cm³)	Density g/cm³

Table 2 - Mass of Post Colored Sheet

Mass (g)	Length (cm)	Width (cm)	Height (mm)	Height (cm)	Volume Of right solid (cm³)	Density g/cm³

Table 3: After Completed and Cooled

(Density of Plastic Number 6 Accepted Density is 1.05 g/cm³)

Mass (g)	Length	Width	Height	Area	Volume	Density g/cm³

Day 4:

Hypothesis Testing:

Objective – using your data make two hypotheses about the relationships of your data.

DO NOW: THINK ABOUT THESE QUESTIONS AND ANSWER IN YOUR NOTEBOOK. So far in this lab we have been measuring several different measurements. Using your notes, what are the measured values that we have found? What are the calculated values that we have found? How do you think that the values are related (How are volume and density related or mass and volume)? Formulate at least two different hypotheses along with their null hypotheses. Write them in your notebook. If finish early answer the questions below

H₁ =

H₂ =

H₀ =

H₀ =

Will there be any relationship to the density of the right solid (the rectangle or square), the density of the shape, When the Shrinky dink film is heated what will happen to the density?

TASKS TO COMPLETE:

_____ Table 1, Table 2, Table 3

_____ **(MAKE SURE TO HAVE ALL OF YOUR VALUES RECORDED BEFORE YOU THROUGH ANYTHING AWAY)**

_____ **Complete the class data sheet make sure to recheck your calculations**

What are the independent and dependent variables? How will you graph the data? How will you tell the relationship from the graph?

Homework: What is a physical and chemical change? What are signs of physical and chemical change?

Do you think that shrink dink shrinking is a chemical and physical or chemical change

Does density change as the amount of matter increases or decreases?