

Bubble 1 One Piece Student 1

Measured Circumference = 14cm  
Measured Diameter = 4.3cm  $r = 2.15$

$\pi D$  Calculated Circumference =  $4.3 \times 3.14 = 13.5$ cm  
 $C \div \pi$  Calculated Diameter =  $14 \div 3.14 = 4.5$ cm

$4\pi r^2$  Surface Area of the bubble  
 $4\pi(2.15)^2$   
 $4\pi(4.62)$   
 $4(14.5)$   
58

$\frac{4}{3}\pi r^3$  Volume of the bubble  
 $\frac{4}{3}\pi(2.15)^3$   
 $\frac{4}{3}\pi(9.93)$   
 $\frac{4}{3}(31.2)$   
42

Mass of gum = 5.2g

Mass after chewed = 1.4g

$5.2 - 1.4 = 3.8$   
 $3.8 = \text{mass lost}$   
 $\% \text{ lost} = (3.8 \div 5.2) \times 100 = 73\%$

Bubble 1 One piece Student 1

Volume vs. Surface Area Comparison

$$\frac{4\pi r^2}{\frac{4}{3}\pi r^3} > 1$$

$r > 0$  because it is a measurement

Bubble 1

$\frac{4}{3} > 1$  Measured Diameter = 4.3cm  
 $3 > 1$   $r = 2.15$

$$4\pi(2.15)^2$$

$$4\pi(4.62)$$

$$4(14.5)$$

(58) = Calculated Surface Area

$$\frac{4}{3}\pi(2.15)^3$$

$$\frac{4}{3}\pi(9.93)$$

$$\frac{4}{3}(31.2)$$

(42) = Calculated Volume

$$\frac{58}{42} = 1.38 = r \text{ less than } 3$$

Bubble 9

Measured Diameter = 5.1cm  $r = 2.55$

$$4\pi(2.55)^2$$

$$4\pi(6.5)$$

$$4(20.42)$$

(81.68) = Surface Area

$$\frac{4}{3}\pi(2.55)^3$$

$$\frac{4}{3}\pi(16.58)$$

$$\frac{4}{3}(52.08)$$

(9.47) = Volume

$$\frac{81.68}{9.47} = 1.18 = r \text{ less than } 3$$

Bubble 3

One piece Student 1

Measured Diameter = 6.8 cm,  $r = 3.4$ 

$$4\pi(3.4)^2$$

$$4\pi(11.56)$$

$$4(36.3)$$

$$(145.24) = \text{Surface Area}$$

$$\frac{4}{3}\pi(3.4)^3$$

$$\frac{4}{3}\pi(39.3)$$

$$\frac{4}{3}\pi(123.4)$$

$$(164.53) = \text{Volume}$$

$$\frac{145.24}{164.53} = 0.88 = r \text{ more than } 3$$

Bubble 4

One piece Student 2

Measured Diameter = 10.1 cm,  $r = 5.05$ 

$$4\pi(5.05)^2$$

$$4\pi(25.5)$$

$$4(80.1)$$

$$(320.44) = \text{Surface Area}$$

$$\frac{4}{3}\pi(5.05)^3$$

$$\frac{4}{3}\pi(128.79)$$

$$4(404.6)$$

$$(1618.4) = \text{Volume}$$

$$\frac{320.44}{1618.4} = 0.2 = r \text{ more than } 3$$

Bubble 2

Ellipsoid Triaks Student 2

Average of radiuses

$$\frac{4}{3}\pi(abc)$$

$$abc = r_1, r_2, r_3$$

$$\frac{4}{3}\pi(5, 3.65, 2.4)$$

$$\frac{4}{3}\pi(43.8)$$

$$\frac{4}{3}\pi(137.53)$$

$$(183.32)$$

$$5 + 3.65 + 2.4$$

$$11.05 \div 3 = 3.68$$

$$\frac{4}{3}\pi(3.65)^3 \quad r = 3.65$$

$$\frac{4}{3}\pi(48.63)$$

$$\frac{4}{3}\pi(152.7)$$

$$203.6 \rightarrow \text{Perfect sphere}$$

$$\frac{4}{3}\pi(5)^3 \quad r = 5$$

$$\frac{4}{3}\pi(125)$$

$$\frac{4}{3}\pi(394.09)$$

$$525.43 \rightarrow \text{Perfect sphere}$$

$$\frac{4}{3}\pi(2.4)^3 \quad r = 2.4$$

$$\frac{4}{3}\pi(13.82)$$

$$\frac{4}{3}\pi(43.39)$$

$$57.99 \rightarrow \text{Perfect sphere}$$

$$\frac{4}{3}\pi(3.68)^3 \quad r = 3.68$$

$$\frac{4}{3}\pi(49.84)$$

$$\frac{4}{3}\pi(156.5)$$

$$203.67$$