EPS 100 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hot Air Balloon Calculations

Formulas:

$Density= \frac{mass}{volume}$ or $D= \frac{m}{v}$

**Mass of Plastic Object** = Surface Area X 0.001 or $m=A×0.007$

*[1 in2 of plastic sheet has a mass of about 0.007g.]*

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**Volume of a box** = Length X Width X Height or $ V=L×W×H$

The boxes on the right are made out of very thin plastic. For each of the boxes, calculate the box’s area, mass, volume, and density.

**Box A:**

Length = 1 in Width = 1 in Height = 1 in Surface Area = 6 in2

1. Mass = \_\_\_\_\_\_\_g

2. Volume = \_\_\_\_\_\_\_in3

3. Density = \_\_\_\_\_\_\_ g/in3

**Box B:**

Length = 0.5 in Width = 2 in Height = 2 in Surface Area = 10 in2

4. Mass = \_\_\_\_\_\_\_g

5. Volume = \_\_\_\_\_\_\_in3

6. Density = \_\_\_\_\_\_\_ g/in3

**Box C:**

Length = 2 in Width = 2 in Height = 2 in Surface Area = 24 in2

7. Mass = \_\_\_\_\_\_\_g

8. Volume = \_\_\_\_\_\_\_in3

9. Density = \_\_\_\_\_\_\_ g/in3

**Box D:**

Length = 9 in Width = 1in Height = 1in Surface Area = 38in2

10. Mass = \_\_\_\_\_\_\_g

11. Volume = \_\_\_\_\_\_\_in3

12. Density = \_\_\_\_\_\_\_ g/in3

**Box E:**

Length = 3 in Width = 3 in Height = 3 in Surface Area = 54in2

13. Mass = \_\_\_\_\_\_\_g

14. Volume = \_\_\_\_\_\_\_in3

15. Density = \_\_\_\_\_\_\_ g/in3

**Questions:**

1. The boxes in the diagram are arranged in order. Are they arranged in order of area, mass, volume, or density?
2. On the diagram, label the boxes with their densities.
3. Based on your answers, what shape is best for having a low density?