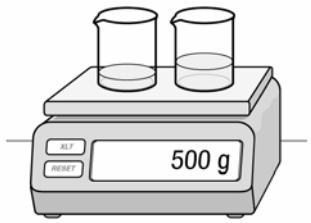
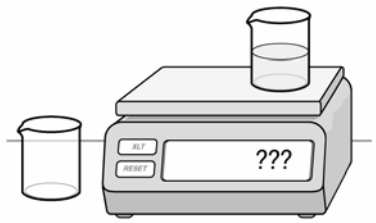
InterActions Unit 4 Chapter 1 Sample Quiz KEY

See the Scientists' Consensus Sheets for assistance.

1. Imagine you have two beakers of 100 g each. You pour 100 g of water in one beaker and 200 g of vinegar in the second beaker. Placing both containers on the scale you measure 500 g. You pour the water in with the vinegar and measure the mass of the beaker of liquid. You measure approximately





   a. 500 g.

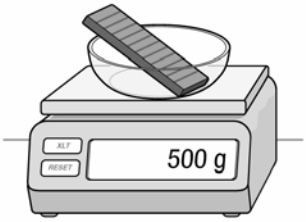
   b. 400 g.

   c. 300 g.

   d. 200 g.

   No mass enters or leaves the system so the mass does not change. To answer this question you need to understand conservation of mass.

2. Imagine you have a 500 g bar of chocolate that you chop to make chocolate chip cookies. After chopping the bar into small pieces you put all the pieces on a scale. The scale measures



   a. Less than 500 g

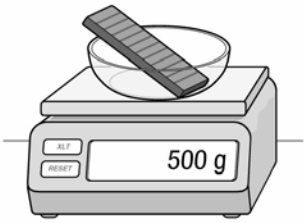
   b. More than 500 g

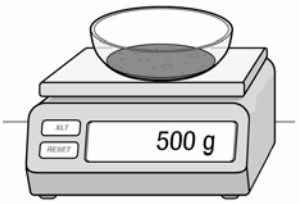
   c. 500 g

   d. It is impossible to know.

   No mass enters or leaves the system so the mass does not change. To answer this question you need to understand conservation of mass.

3. Imagine you have a 500 g bar of chocolate that you melt. After melting you measure the mass of the melted chocolate. The scale measures





a. Less than 500 g

b. More than 500 g

c. 500 g

d. It is impossible to know.

When you melt a substance, its mass does not change. To answer this question you need to understand conservation of mass.

4. During an interaction in a closed mass system, the volume

a. always increases.

b. always decreases.

c. always stays the same.

d. may increase, decrease, or stay the same.

The experiment you did mixing alcohol and water showed that the mass stays the same but the volume did not. To answer this question you need to know that volume is not always conserved in a closed mass system.

5. You are making jello. After mixing the ingredients you pour the liquid in a bowl, cover it tightly, and place it in the fridge. In a short time it becomes a solid. The mass of the solid jello is

    a. Greater than the mass of the liquid.

    b. The same as the mass of the liquid.

    c. Less than the mass of the liquid.

    d. There is no way to tell.

    The jello changes phase, but no mass enters or leaves the bowl of jello. To answer this question you need to know that mass is conserved in a closed mass system.

6. To make a cup of tea you place 1 cup of water in a pot and bring it to boil. After you have boiled the water you have _____ of water left.

    a. less than a cup

    b. a cup

    c. more than a cup

    d. There is no way to tell.

    During boiling, some of the liquid water goes turns into a gas and leaves the system. To answer this question you need to know that mass may not be conserved in an open mass system.

7. You pump air into your volleyball ball. The ball's mass

    a. decreases

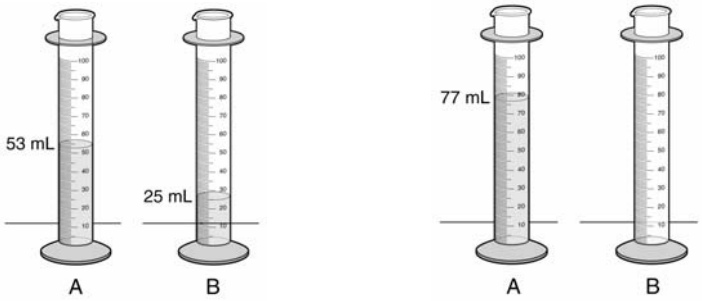
    b. increases

    c. stays the same

    d. There is no way to tell.

    Air has mass so when you pump more of it into the ball, the ball's mass increases. To answer this question you need to know that mass may not be conserved in an open mass system and that air has mass.

8. Someone mixes two liquids together. Liquid A has a volume of 53 mL. Liquid B has a volume of 25 mL. When these liquids are mixed together the volume is measured to be 77 mL. The uncertainty in the measurement is 2 mL. You cannot conclude the volume decreases because



a. the decrease in volume is less than the uncertainty

b. the decrease in volume is greater than the uncertainty

c. the decrease in volume is equal to the uncertainty

d. the decrease in volume has nothing to do with the uncertainty in the measurement.

To answer this question you need to know how a conclusion is based on the uncertainty of your measurement.

9. Minal mixes in a large bowl 500 g of flour with 25 g of water and 50 g of butter to make dough. She then takes out 10 g to test. How much dough is left in her bowl.

a. 585 g

b. 575 g

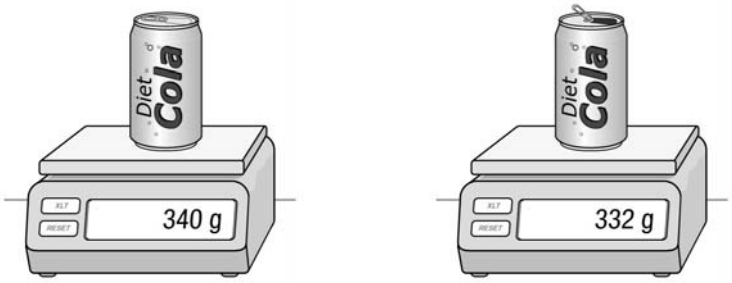
c. 565 g

d. 560 g.

To answer this question you need to know how to use the formula

Start Mass + Input Mass – Output mass = End Mass

10. Some students decided to do an experiment with a can of soda. They opened a 340 g can of soda and left it open for a day. They then measured the soda can and found it was 332 g. The uncertainty in the measurement was 2 g. They then poured some of the soda in a glass and observed that it was no longer fizzy.



Analyze and Explain why the soda has less mass after it has gone flat.

Analysis: The system includes the can of soda and its contents. The system has no mass input. The system has mass output (the gas and any liquid that evaporated). The system is an open system.

Explanation: The system is an open system because the gas (carbonation) in the soda leaves the open soda can, reducing the mass of the system. Some of the liquid may evaporate, this also reduces the mass of the system.