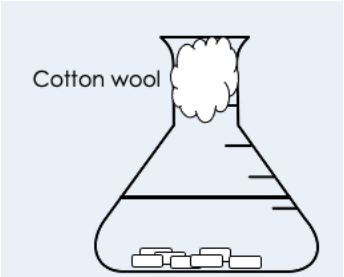
Conservation of Mass

Read the paragraph below.
Use the information provided to answer the question.

Johar decided to observe the reaction between lithium and water in a conical flask with some wool in the neck.



Before the reaction starts, he uses a balance to check the mass of the lithium and the water.

When the lithium is added to the water there is fizzing. After some time there is no more fizzing. Johar then weighed and found the mass of the lithium hydroxide solution. Looking at it he said, "Oh my! Mass just disappeared! The teacher and his law of conservation of mass are nonsense!!"

Using the data, picture of the equipment and the equation below, explain why Johar is wrong to doubt the teacher.

Lithium + Water → Lithium Hydroxide + Hydrogen

$$2Li_{(s)} + 2H_2O_{(l)} \rightarrow 2LiOH_{(aq)} + H_{2(g)}$$

Masses of substance (g)		
Lithium	**Water**	**Lithium hydroxide solution**
2g	**80g**	**81g**

<u>Steps for success</u>
For a great response, you should include answers to the following questions:

1. What is the law of conservation of mass?
2. What is the total mass of the reactants?
3. What is the mass of the lithium hydroxide solution?
4. What is missing here?
5. Why is the mass 81 on the scales? Use evidence from the symbol equation.
6. Why hasn't the wool stopped this?

7. What will the mass of the hydrogen be?
8. Stretch: What should you use instead if you want to accurately measure the mass of the products?
9. Super stretch: What is the problem with the term weigh?

Steps for success

1) **What is the law of conservation of mass?** The law of conservation of mass is that atoms (mass) cannot be created or destroyed, just transferred from one form into another.
2) **What is the total mass of the reactants?** The total mass of the reactants is 82g
3) **What is the mass of the lithium hydroxide solution?** The mass of the lithium hydroxide solution is 81g
4) **What is missing here?** The mass of the hydrogen gas is missing here.
5) **Why is the mass 81 on the scales? Use evidence from the symbol equation.** The mass is 81g on the scales because the hydrogen is a gas as it has a small (g) beside it in the symbol equation and as a gas, it has escaped from the conical flask
6) **Why hasn't the wool stopped this?** The wool hasn't stopped this because the gas particles are small and spread out so they can make their way through the wool into the air.
7) **What will the mass of the hydrogen be?** The mass of the hydrogen will be 1g.

Stretch: What should you use instead if you want to accurately measure the mass of the products? You should complete the reaction in a sealed space (use a rubber bung to seal the conical flask)

Super stretch: What is the problem with the term weigh? Weight is a force, when we say weigh what we really mean is find the mass of.