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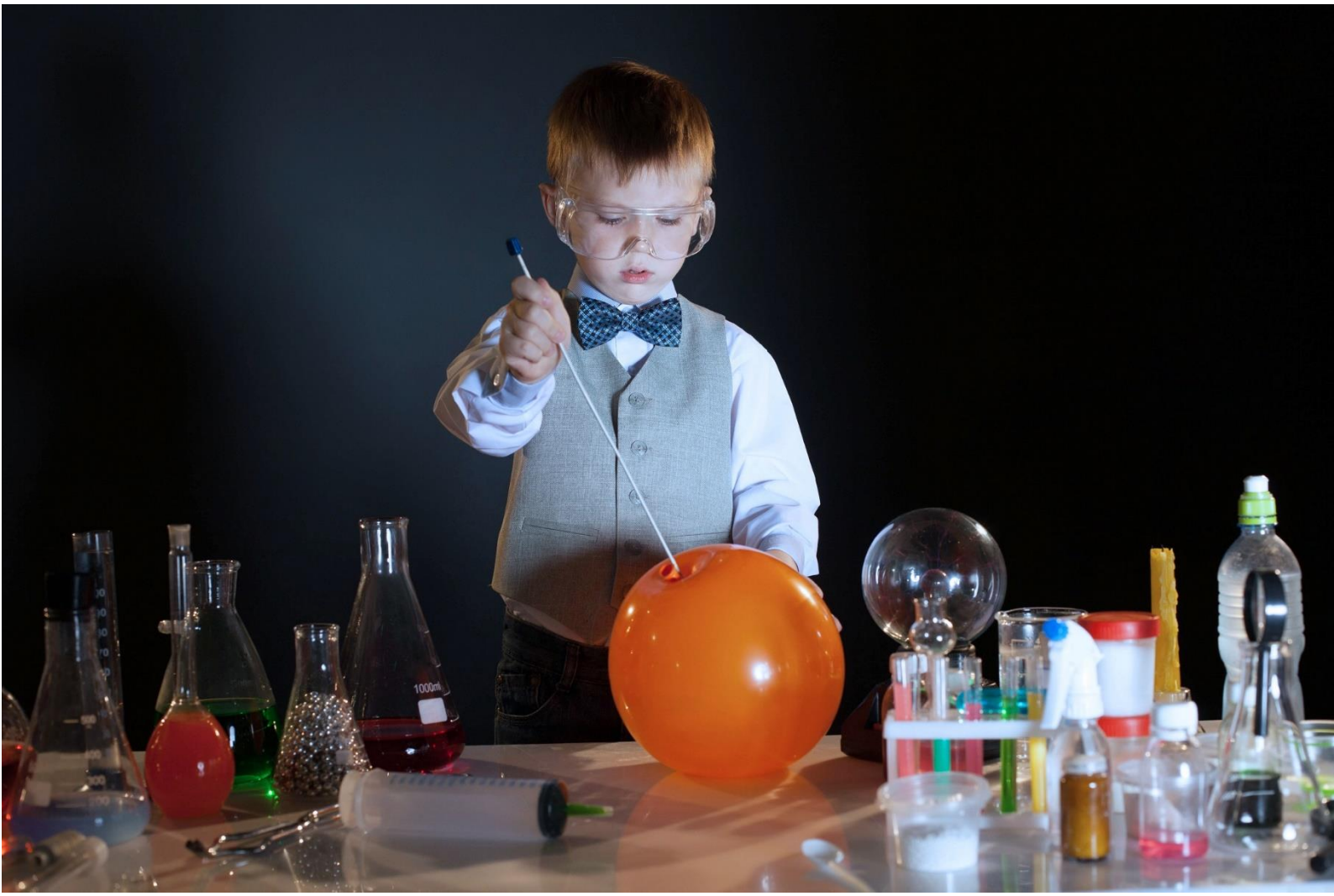

LESSON: Acid Base reactions

OBJECTIVE: To introduce acid-base reactions and create $CO_2$

### Materials

12" balloon, 250ml flask, funnel, white vinegar, baking soda

### Instructions

1. Ask the children if they can know how much gas is produced from a basic reaction, and whether they understand an acid base reaction.
2. Pour 100ml of vinegar into the flask
3. Connect the funnel to the balloon and insert 2 teaspoons of baking soda into the balloon
4. Without emptying the balloon into the flask, stretch the balloon over the neck of the flask
5. Empty the contents of the balloon into the flask and hold onto the neck of the balloon
6. Watch the immediate reaction take place and the balloon inflate as CO2 is generated
7. When the reaction is complete, disconnect the balloon from the flask

### Conclusion

Vinegar is dilute Ethanoic Acid (dilute acetic acid) whilst baking soda is Sodium Bicarbonate. The reaction is a classic acid-base reaction with the following word formula:

Acetic acid + Sodium Bicarbonate = sodium acetate + water + carbon dioxide

In chemical formula:

$$NaHCO_3 + HC_2H_3O_2 \rightarrow NaC_2H_3O_2 + H_2O + CO_2$$

TRY: Try using the same amount of vinegar but 4 different amounts of baking soda and plot a graph of volume of gas generated. Or, use different amounts of vinegar with the same amount of baking soda. The volume can be approximated by measuring the balloon and treating is as a sphere, or dipping it into water for a displacement measurement of volume

You could boil off all the water from the solution and yield a super saturated solution of Sodium Acetate. This is also known as Hot Ice and will instantly crystallise into a solid from a liquid on contact.

**Need some free balloons for your lessons? Contact us on info@partysafe.eu. Please keep the fun in balloons and dispose of them correctly. For more information and educational resources, please visit www.partysafe.eu.**