

Acids and bases

Theme	Chemicals in our lives
Level	Middle and higher
Topics covered in syllabus	Acids, base, indicator, natural indicator
Academic Objective	Child will be able to understand what the indicator is, making of natural indicator, introduction to acids and bases, neutralisation, introduction to pH, body and alkalinity, neutralisation in the digestive system.
Attitudinal Objective	<ul style="list-style-type: none"> • Study of a acid and base by getting in touch with what is happening in the human body • Health and food we eat and its relation with acidity and alkalinity of the body. • Understanding the concepts of acid, base and salt from everyday life, • understanding the relation between acid base and salt
Action Objective	<ul style="list-style-type: none"> • Understanding the interconnections of the type of food and the health in human body • Big picture on food habits and farming and food industry Learning to make natural indicator
Items/ Resources needed	<ul style="list-style-type: none"> • pH strips, • Printout of Bhoomi magazine article • Beetroot, Hibiscus, Turmeric, Lemon juice, tamarind, black coffee, baking soda, milk, salt solution, sugar solution, tooth paste, vinegar, washing soda, water
Links	<p>http://bhoomimagazine.org/2010/03/31/seeing-the-connections-food-health-and-climate-change/ https://www.youtube.com/watch?v=K-mgmIjaRlY</p> <p>Resource for teacher: https://medcraveonline.com/IJCAM/IJCAM-10-00329.pdf#targetText=Matter%20is%20not%20made%20out,Nobel%20laureate%20Hans%20Peter%20Duerr</p>
Learnings/ outcome	<ul style="list-style-type: none"> • Study of a acid and base by getting in touch with what is happening in the human body • Health and food we eat and its relation with acidity and alkalinity of the body. • Understanding the concepts of acid, base and salt from everyday life, • Understanding the relation between acid base and salt

Activity 1:

Day 1. - 45 minutes Testing the pH of the body by using a pH paper.

- Children are asked wash their mouth, if they just have consumed some food.
- They again have to swallow some saliva/spit it out.
- Test the fresh saliva in their mouth with the pH paper provided.
- The strip will change colors based on the acidity/alkalinity of your saliva.
- The outside of the box of pH strips will have a color chart.
- Match the color of your pH strip to the color chart to determine your saliva's pH level. (This tool can be used to understand something is off track and is not a complete test for alkalinity of the body).
- Once the testing is done children can read one article to understand the pH of the blood and the relation between food we consume and the alkalinity of the body. Each group of 6 is handed over the reading material. They are asked to discuss on the content. As and when they read, the group has to make a chart in the form of mind map, where the connections of food and health has to be mentioned.
- Multiple connections on how our habit is affecting health, land, water, soil and air also have to be mentioned in the chart. Children can make use of colors and small diagrams to give emphasis on what they want to convey. Suggested reading material: <http://bhoomimagazine.org/2010/03/31/seeing-the-connections-food-health-and-climate-change/>
- As and when they read, children will write down the questions which they come across/ discuss. The questions need not be answered.
- At home they can write their reflection on the reading material in the form of a story/ poem/ poster/ others.

Day 2 : 45 minutes

- Presenting the Chart to the larger group and putting it up on the soft board. Collating all the questions they have discussed also can be shared with the larger group and if they want to discuss, it can be discussed.

Day 3: 45 minutes

- Presentation of the observation of testing some of the food items/ household chemicals/solutions with pH indicator which they have prepared at home.
- Make homemade indicators and test whether the following house hold solutions or juices of fruits are acidic/basic/neutral.
- Beetroot indicator is made by spreading the beetroot juice/ boiling beetroot over a cotton cloth or on a paper (blotting paper/filter paper will give good results, normal paper also can be used).
- Turmeric indicator is also made by spreading turmeric paste over a sheet of paper or a cloth.
- Make hibiscus(china rose) indicator by rubbing hibiscus flower on to the paper.
- These paper/cloth are cut into small strips to test the different solutions such as Lemon juice, tamarind, black coffee, baking soda, milk, salt solution, sugar

- solution, tooth paste, vinegar, washing soda, water etc.
- Check whether the tested items comes under the category of acid or base and categorise after comparing with the group.
 - Write on how the uses of strong house hold reagents (e.g. detergent powder, toilet cleaner, and glass cleaner) can affect the abiotic components like water, air and soil. Show all possible connections. (You can support your answer with a flow chart/ mind map/ diagrams)(group activity).

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