

## Day 1 – Acid & Bases (1)

**Learning:** Learning about acids and alkalis and how they react with other substances.

**Video:** Introducing alchemists and the copper coin Experiment

**Coin Experiment** – What substance is the best substance for changing a dull coin into a shiny coin.

### What you need:

- Vinegar
- Salty Water
- Water
- Vinegar and Salt

### What to do:

Put the four solutions into the Palette, get each child to dip half the coin into the solution for 15 secs.

### Which solution worked the best?

Vinegar and salt – the vinegar reacted with the copper to make it shiny. But where did the dull copper go? Put all the coins in a bag with the vinegar and salt water in it, add a nail. Will check results tomorrow.

What else can Vinegar do?

**Video:** show them the video of vinegar dissolving metal

What is Vinegar, you can actually buy it in a grocery store, it used in lots of foods. It is one of the ingredients in salad dressings. It is used because it has a sour taste.

Alchemist also discovered that there was another substance that could dissolve metal – Lemon Juice. Just like vinegar, lemon juice tastes very sour.

**Video:** Show them the video of Lemon Juice dissolving metal.

So both Vinegar and Lemon Juice have two properties in common: they are sour and they both dissolve metal.

The Alchemist called them acids (meaning sour in Latin)

Vinegar is commonly called acetic acid and Lemon Juice is citric acid.

What other ways do they react:

Acid reaction tests

**What you need:**

- Reaction Sheet
- Plastic
- Buckets
- Syringes
- Baking Soda
- Baking Power
- Vinegar
- Red Cabbage Juice

**What to do:**

- Put the substances in the correct circles using syringe or popsicle stick
- Observe to see what happens.

**What Happened?**

The vinegar reacted with the baking soda and changed the red cabbage juice colour.

1. Baking Soda is base, acid and bases always react, will talk about this in tomorrows lesson
2. Red cabbage juice indicates if a substance is an acid or base.

**Red Cabbage acid and base test**

**What you need:**

- Red Cabbage Juice
- Have the following substances in bottles: Tap Water, Vinegar, Baking Soda solution, Washing soda, citric acid, bleach.
- Plastic Palettes.
- PH Indicator worksheet.

### ***Red Cabbage Color Indicator Chart***

pH	pH less than 7 = Acid			pH more than 7 = Base		
	2	4	6	8	10	12
Color						
	Red	Purple	Violet	Blue	Blue-Green	Green-Yellow

#### **What to do:**

- Add enough cabbage juice to cover the bottom of 7 of the wells of the palette.
- Add the substance you want to test and see what colour it changes to.
- Fill out worksheet.

#### **Group Time**

- Enlarge Red Cabbage Chart and put it on the board
- What substances were alkalis and which substances were acid?
- Place pictures of substances on the Chart.

**Tap Water** – Neutral

**White Vinegar** – Acid

**Baking Soda solution** – Alkaline

**Washing Soda** - Alkaline

**Citric Acid Solution** – Acid

**Bleach**- Alkaline

Bases are usually used in cleaning products as they react with fats and dirt and help clean dishes.

#### **Colour changing milk experiment**

##### **What you need:**

- Milk silver top
- Food colouring
- Dishwashing soap in a container
- Cotton Buds
- Plate

##### **What to do:**

- Pour enough milk in the dinner plate to completely cover the bottom to the depth of

about 1-2cm.

- Add one drop of each of the four colours of food colouring - red, yellow, blue, and green - to the milk. Keep the drops close together in the centre of the plate of milk.
- Dip the cotton bud into the dishwashing soap
- Then dip it into the centre of the milk.

### Group Time

- Is there fat in milk? Yes
- So when you put the dishwashing liquid in the milk, it reacts with fat making the milk move.
- Dishwashing liquid is alkaline.

Make the following chart on the board by asking the below questions:

	Acid	Alkali
Red Cabbage Test	Pink - Red	Blue – Green
Taste	Sour	Bitter
What does it react with?	Metals	Fat
What are they used for?	Cooking, Preserves	Soap & Cleaning Products

- What does a lemon taste like? Sour
- What does soap taste like? Bitter
- What does soap remove from your hands when you wash them? Dirt & Fat
- Did the acid or alkali react with metal? Acid
- What are alkalis used for (hint: react with dirt and fat) Soaps & Cleaning Products
- What is vinegar used for? Cooking

Start on making the volcanoes for tomorrow's experiment

1. Cut out the cone shape
2. Colour cone.
3. Laminate cone.