Hair Color

You need (per group)

- 1 plastic beaker
- 1 cheesecloth (gauze) square
- 1 rubber band
- A baggie of water beads

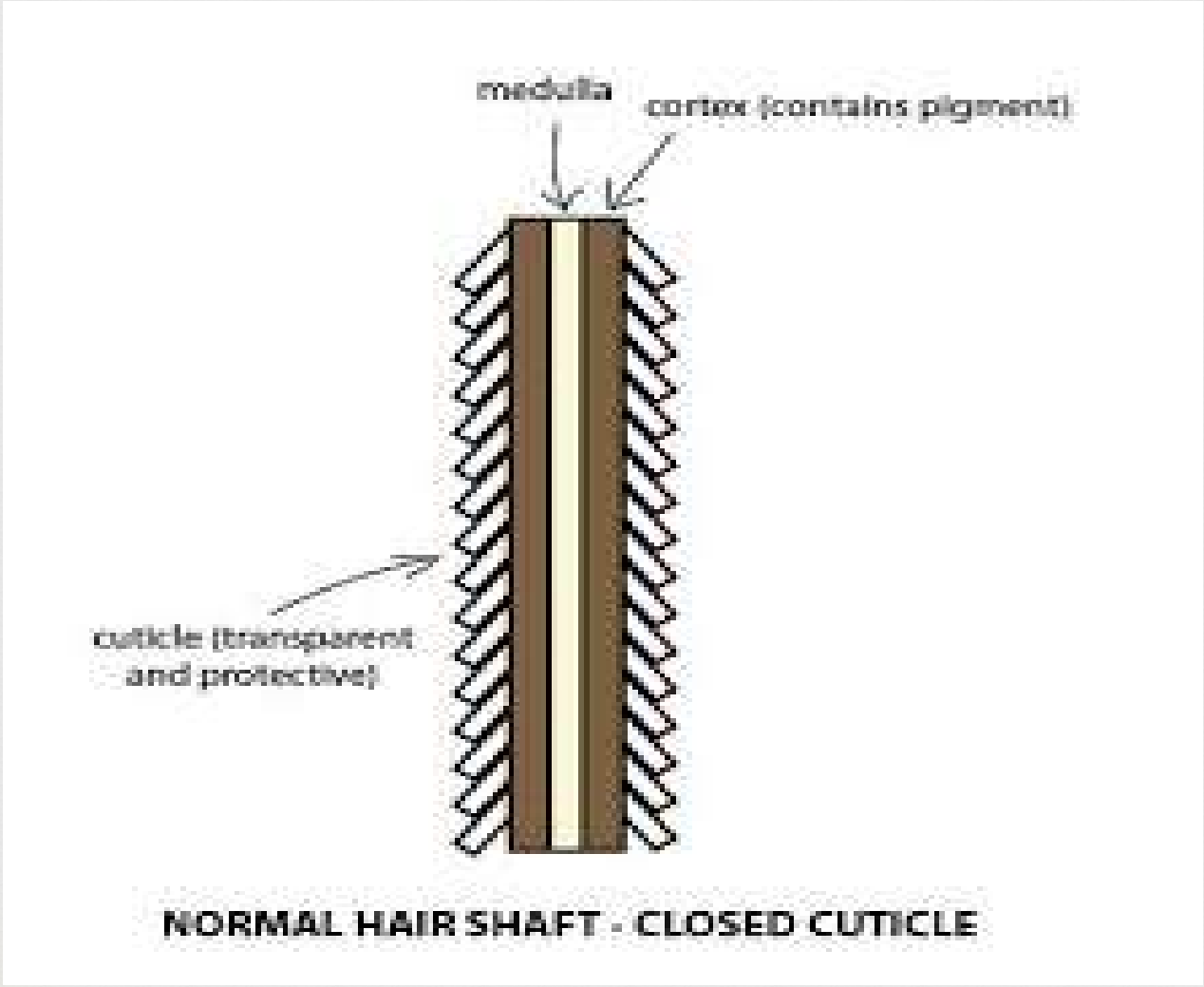
A model of a dye molecule:

- Fill the beaker ½ full of water
- Cover the beaker with cheesecloth / gauze hold it in place with a rubber band
- push your beads into the beaker
- Let it sit

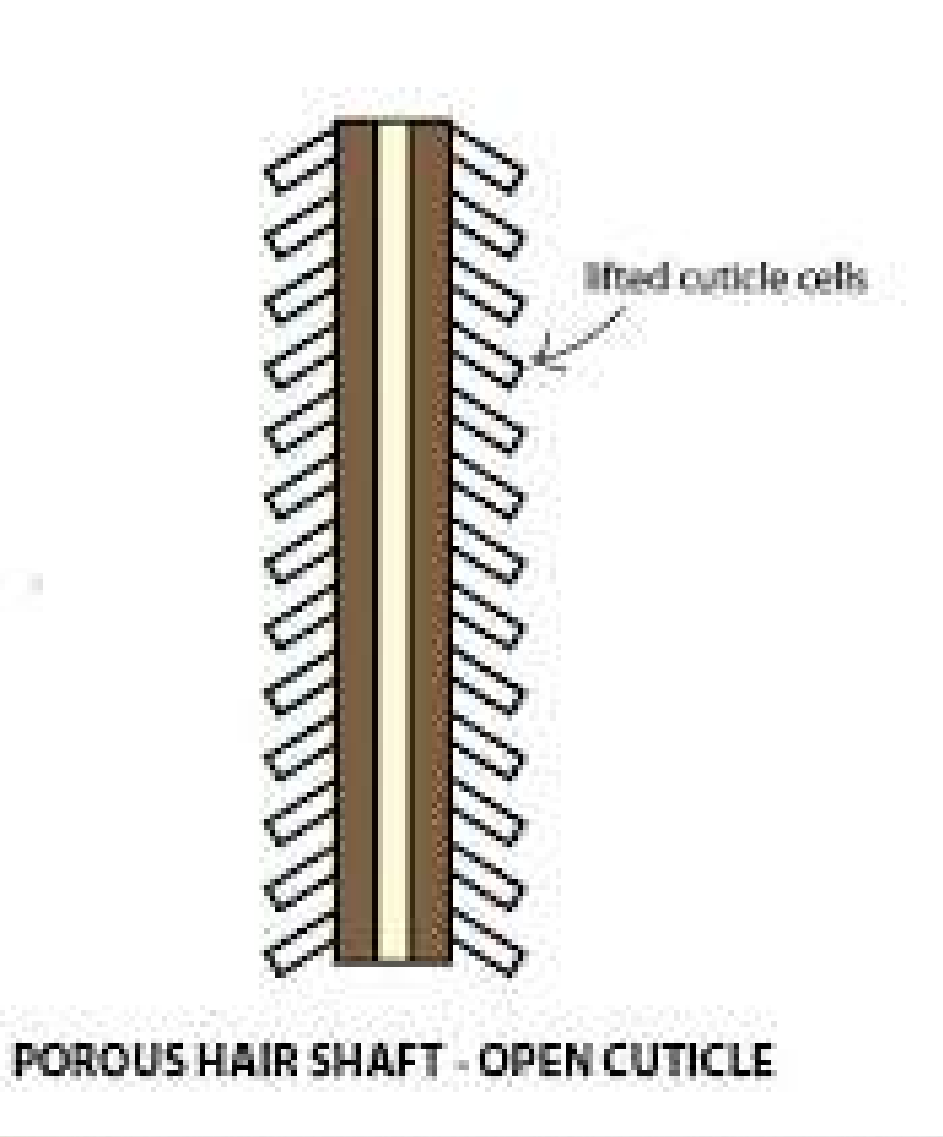
What do the things in the model represent

Model	Reality
Cup	Hair Shaft
Gauze	Cuticle
Water	Cortex
Beads	Dye Molecules

What happens during permanent hair coloring



Open the cuticle:

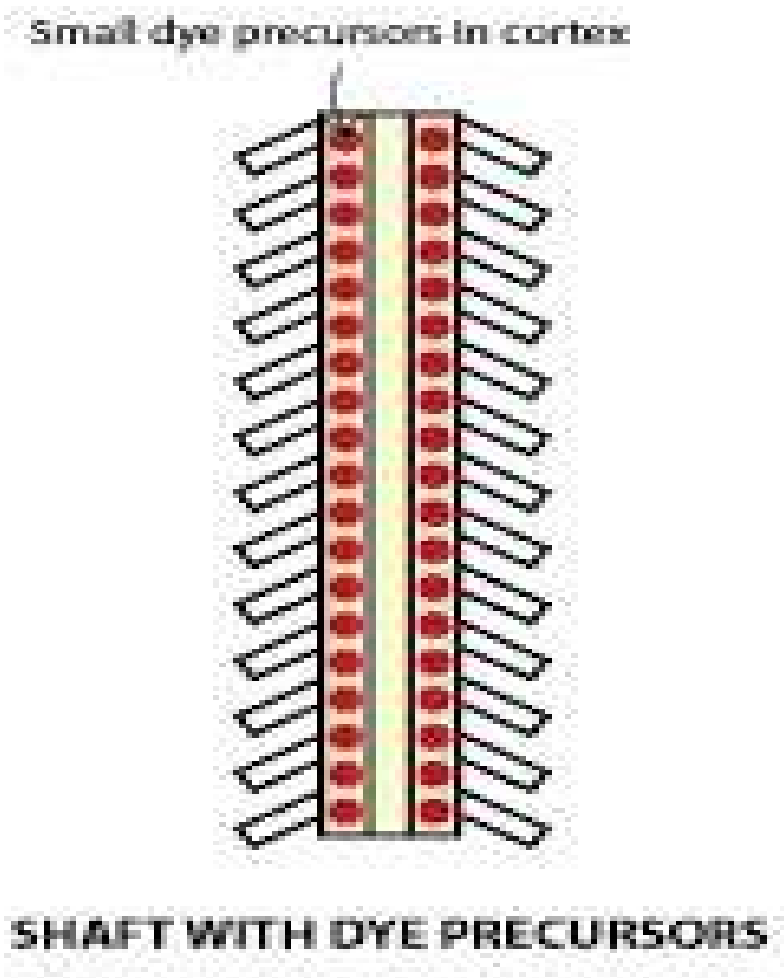


- The cuticle scales need to be lifted so the dye can get to the cortex.
- This is done using an alkaline chemical, usually ammonia

Add dye precursors:

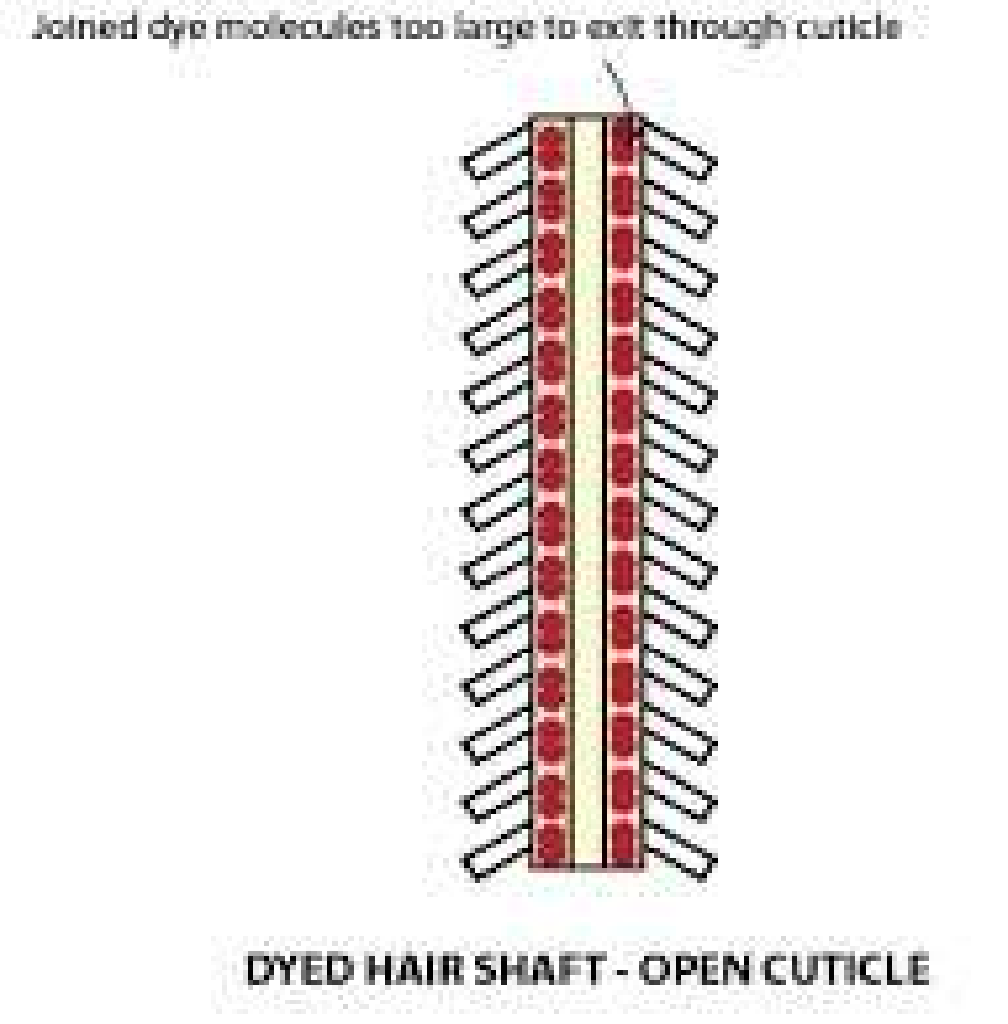
- Small dye precursor molecules
- soak into the cortex through the gaps in the open cuticle.

LIKE THE BEADS IN YOUR BEAKER



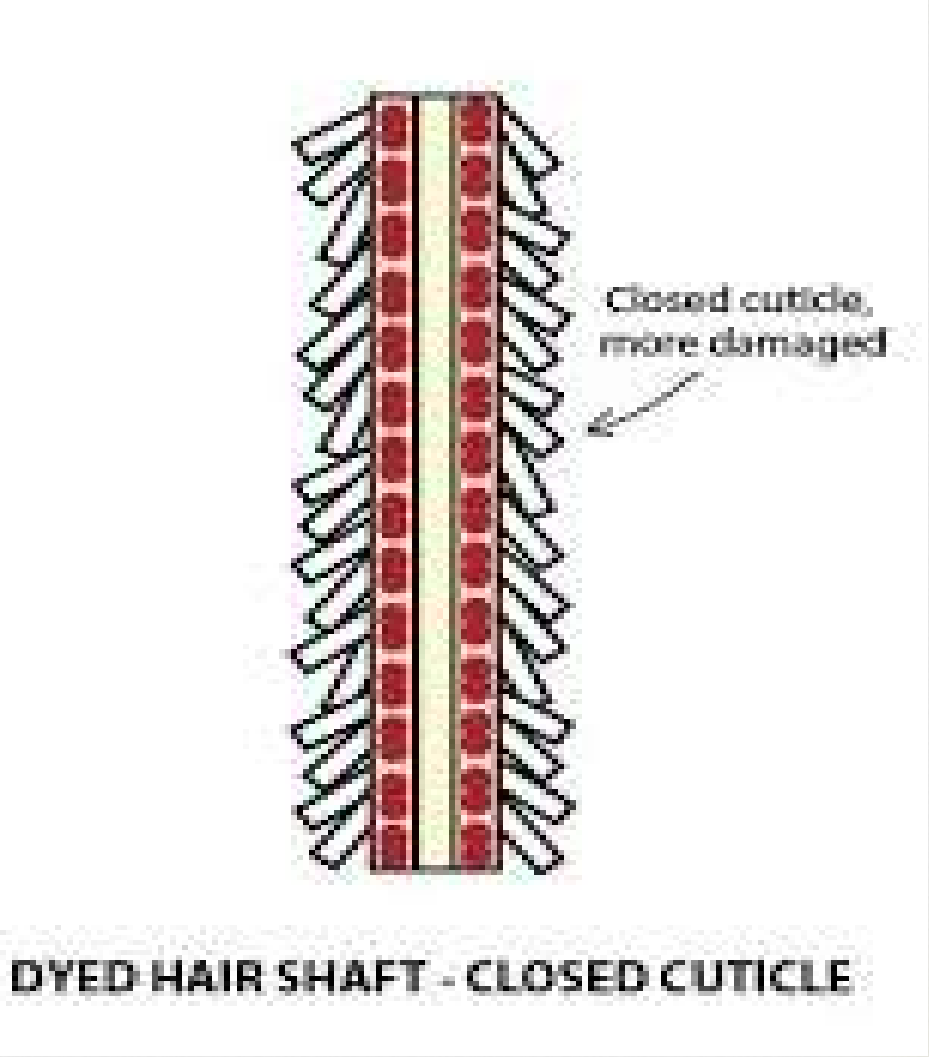
React precursors to form the dye :

- precursor molecules react with each other and the hydrogen peroxide and ammonia
- the final large dye molecules are formed
- These are too big to wash out easily



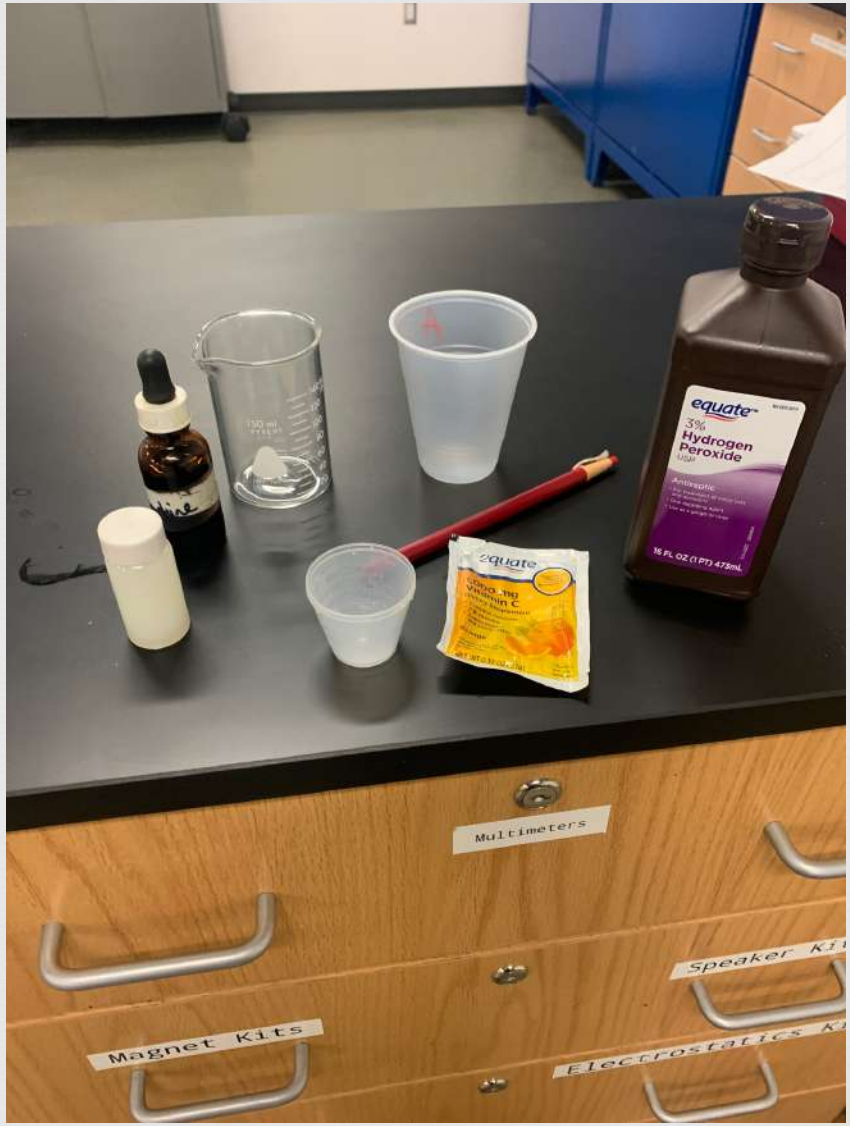
Close the cuticle

- The cuticle is closed after dyeing
  - usually with an acidic conditioner.



A sample oxidation reaction:

- 1 glass beaker per group
- vitamin C packet
- water bottle
- iodine dropper
- 2 small measuring cup
- peroxide
- Stir sticks
- starch solution
- marker / red pencil
- 2 plastic cups *per person*



for the group:
In your glass beaker

- measure 60 ml water
- add vitamin C powder
- Stir to dissolve

EVERYONE Label "Cup A"

- fill to bottom line with water (~60 mL)
- MEASURE with medicine cup
- add 5 mL vitamin C solution from the glass beaker
- add 5 mL iodine solution CAREFULLY this stains
- STIR

EVERYONE Label "Cup B"

- fill to bottom line with water
- Measure with other Medicine cup add 15mL peroxide
- add 5 mL starch solution
- STIR

A sample oxidation reaction:

- Pour all of LIQUID A into LIQUID B. Then pour them back and forth between the 2 cups 25 - 30 times.
- Place the cup down and observe….be patient....

- This is an example of the oxidation reaction that happens in hair dyes.
- The dye only changes color when it is oxidized.
- The peroxide developer changes the color of the dye chemicals by oxidizing them.
- If the color has changed so has the size
  - This means it is too big to penetrate the cuticle

Make observations of beads

- tip the beaker up to pour the water out.
- What happened to the beads?
- ANSWER THE QUESTIONS

3. What did the beaker represent?
4. What does the gauze represent
5. What happened to the dye beads?
6. In the end did they stay in the hair shaft or fall out, WHY ?