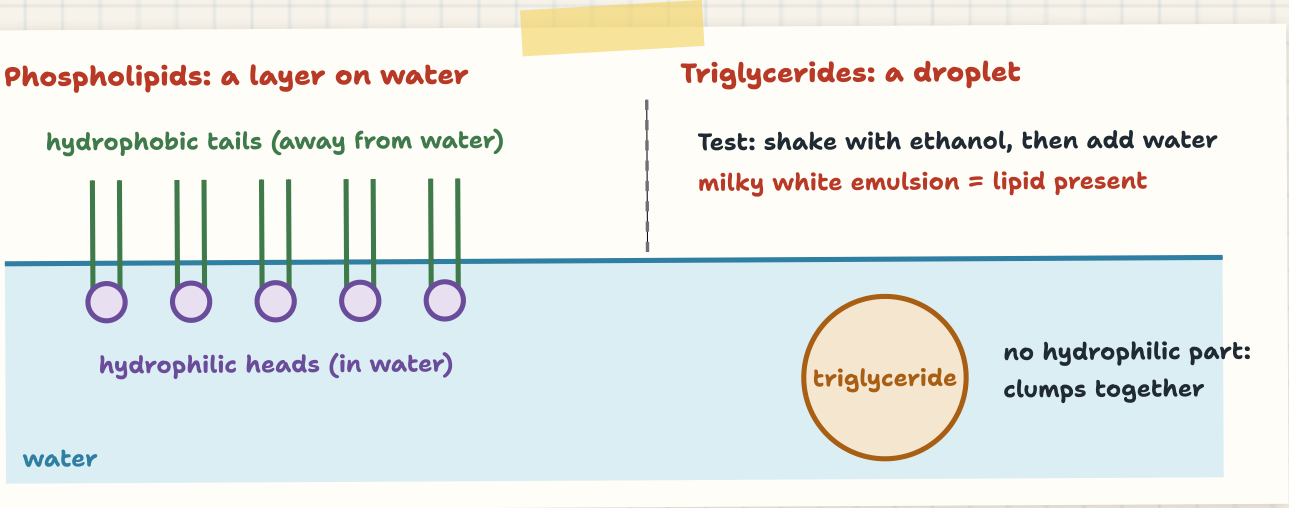
# Phospholipids vs Triglycerides: Emulsion Test

Phospholipids have a hydrophilic head and hydrophobic tails; triglycerides have only tails. The emulsion test detects lipids.




## Key terms

| | |
|---|---|
| **phospholipid** | a glycerol backbone with two fatty acid tails and one phosphate-containing head in place of the third fatty acid. |
| **hydrophilic** | attracted to water; the phosphate head. |
| **hydrophobic** | repelled by water; the fatty acid tails. |
| **bilayer** | a double layer in water: heads face the water on both sides, tails tucked inside. |
| **emulsion test** | shake the sample with ethanol, then pour into water; a milky white emulsion shows lipid. |
| **triglyceride (here)** | entirely hydrophobic and insoluble, so a good energy store (respiratory substrate); not a polymer. |

## I can...

- [ ] In phospholipids one fatty acid is substituted by a phosphate-containing group
- [ ] Explain the different properties of triglycerides and phospholipids related to structure
- [ ] The emulsion test for lipids

**EXAM TRAP**

The phosphate head is hydrophilic, never hydrophobic. In the test, do ethanol first, then water, and write "white emulsion", not just "cloudy".

## 5 marks: what earns them

1. Phospholipid has a hydrophilic (phosphate-containing) head and hydrophobic fatty acid tails
   Not: head is hydrophobic; tails are hydrophilic; phospholipids dissolve
2. Heads face the water and tails face away from the water (so a layer forms at the surface)
   Not: heads and tails face the same way; no reference to water
3. Triglyceride has no hydrophilic part / is entirely hydrophobic (insoluble), so molecules clump into a droplet
   Not: triglycerides are too big; triglycerides are hydrophilic
4. Shake / mix the sample with ethanol, then add (pour into) water
   Not: add water first; add Benedict's or biuret
5. A (milky) white emulsion shows lipid is present
   Not: cloudy alone; turns white with no emulsion; precipitate

**Remember**

Heads toward water, tails away from water.
Ethanol first, then water.
Lipid present = milky white emulsion.



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