

Aim: How is PHOSPHORUS cycled through the ecosphere?

IMPORTANT FACTS CONCERNING PHOSPHORUS AND THE PHOSPHORUS CYCLE:

1. Phosphorus - mainly in phosphate ions (PO_4^{3-}) - is important in plants and animals as part of DNA, chemical energy in cell respiration, and in skeletons, bones, teeth, and shells
2. Phosphorus does NOT form gaseous compounds
3. The biological part of the cycle is quick, but the geological/sedimentary part is VERY SLOW



1 Uplifted phosphorus-rich rocks and minerals are exposed at the surface

a **Weathering** (breakdown of rocks) cause phosphates to be **leached** from rock (carried away by percolating water)



2 Dissolved phosphorus in soil water and runoff that carries phosphorus to aquatic systems



b Absorption by land and aquatic plants



3 Plants incorporate phosphorus into organic molecules which is then passed onto animals in the food chain



c Decomposition of plants, animals and wastes such as **guano** (P-rich fecal matter from fish-eating birds)



4 Phosphorus-rich land and ocean sediments that will cycle through soil and food chains or eventually form rocks again (uplift can expose ocean rock to be weathered)

Human Influence on the Phosphorus Cycle

1.

Mining of P-rich rocks to make
fertilizers and detergents

2.

Land clearing (esp. tropical forests) removes P in the biomass.
Little remaining P in soil is then washed away with rains

3.

Excess P runoff from fertilizers and detergents
into aquatic systems → cultural eutrophication