Monomers, Polymers, Synthesis and Hydrolysis
Monomers and Polymers

**Monomers** are single units that can be put together to form larger units called **Polymers**

**Monomer --> Polymer VIDEO**

Mono- ‘One’
Poly- ‘Multiple’
Biomolecules

• Biomolecules are any molecules found in living organisms.

There are 4 major types of Biomolecules:

• Lipids
• Carbohydrates
• Proteins
• Nucleic Acids
Biomolecules

• The 4 Biomolecules are considered polymers which are made up of multiple monomers, each type has its own monomers:

<table>
<thead>
<tr>
<th>Biomolecule (Polymer)</th>
<th>Building Block (Monomer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>Monosaccharide</td>
</tr>
<tr>
<td>Lipids</td>
<td>Glycerol and 3 Fatty Acids</td>
</tr>
<tr>
<td>Proteins</td>
<td>Amino Acids</td>
</tr>
<tr>
<td>Nucleic Acids</td>
<td>Nucleotides</td>
</tr>
</tbody>
</table>
Carbohydrates

Monosaccharide + Monosaccharide $\rightarrow$ Carbohydrates

- glucose (a monosaccharide)
- sucrose (a disaccharide)
- amylose (a polysaccharide/starch)
Lipids

Glycerol + Fatty Acids $\rightarrow$ Lipid
Proteins

Amino Acids + Amino Acids $\rightarrow$ Proteins
Nucleic Acids

Nucleotides + Nucleotides $\rightarrow$ Nucleic Acids
Forming Polymers

• Monomers are strung together using Dehydration Synthesis

• Dehydration synthesis is a process where 2 monomers are attached by removing 1 molecule of water

Dehydration: Lacking/losing water
Synthesis: Creating/building something
Forming Polymers: Dehydration Synthesis

1 water molecule is removed (dehydration)
A bond is formed between the two monomers
Breaking Apart Polymers

- Polymers are broken apart using a **Hydrolysis**

- **Hydrolysis** is a process where 2 monomers are broken apart from each other by adding 1 molecule of water

  *Hydro-* Water

  *Lysis-* To break apart
Breaking Apart Polymers: Hydrolysis

1 water molecule is added

The bond between monomers breaks

[Diagram showing glucose molecules connected by an oxygen atom, with a water molecule added, and a bond breaking.]