KINGDOM MONERA

- Examples : bacteria, blue-green algae (cyanobacteria)
- Very small in size (about 1 micrometer)
- Prokaryotic – The genetic material (DNA) is not enclosed in a distinct nuclear membrane.
- Cell shapes can be round ("coccus" e.g. in streptococcal throat infection), rod-shaped ("bacillus" e.g. *Escherichia coli* which normally lives in the human gut), or spiral-shaped ("spirillus" e.g. in cholera)
- The coccal bacteria may be arranged in rows ("streptococcus" e.g. in streptococcus) or in clusters (" staphylococcus" e.g. in staphylococcus).
- Some of the rod- or spiral-shaped bacteria may move by means of a whiplike flagellum (plural: flagella)

Refer to diagrams of bacteria in your textbook: Recognise the 3 shapes of bacteria - coccus, bacillus and spirillus. Also take note that bacteria have no nuclear membrane.

- Cell wall is not made of the same chemical as plant cell walls. Monerans can be identified by whether their cell walls can be stained or not by a Gram stain. In the case of disease-causing bacteria, this is of advantage in quick identification to prescribe appropriate antibiotics.
- Many can survive unfavourable conditions such as extreme dryness or heat by producing an extra spore coat.
- Most reproduce asexually by binary fission approximately every 20 minutes. The bacterium duplicates its genetic material (DNA) and then splits into two smaller cells.
- Some are autotrophic, i.e. produce their own nutrients from sunlight (photosynthetic), from sulphur or iron (chemosynthetic).
- Some are heterotrophic, i.e. obtain their nutrients by absorbing them from other living organisms (e.g. disease-causing or pathogenic bacteria that produce toxins).
- Some require oxygen to live (aerobic), and some do not (anaerobic).
- Some are harmful (e.g. disease-causing or pathogenic bacteria), and some are useful (e.g. decomposing bacteria which rot dead matter to recycle nutrients into the soil).
- Pasteurisation involves heating milk to more than 60^{o}C (when protein coagulates), and then quickly cooling it.

*Did You Know That…?*Every square centimetre of human skin supports 5 million bacteria.