

1. Microorganisms are everywhere

Hand washing



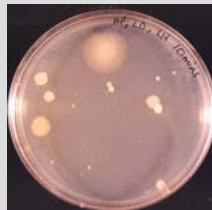
We showed that it was difficult to get rid of all the microorganisms on your hands, even after washing with lots of soap



Aerial Contamination

Petri dishes full of nutrient agar were exposed in different areas of the school over 60 minutes. The nutrient plates were incubated at 30°C for 7 days and then the microbial colonies were counted

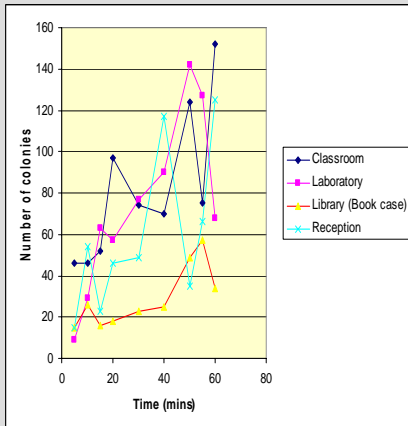
10 minutes



20 minutes

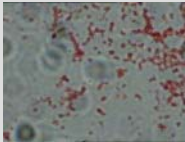


60 minutes



The number of microorganisms increased over time. There were fewer microorganisms isolated from the library than anywhere else!

2. The Gram Stain



Pseudomonas fluorescens is a Gram negative bacterium and stains red. These cells are magnified 1000 times!



Bacillus megaterium is a Gram positive bacterium and stains purple.

Bacteria can either be Gram Positive or Gram Negative.

3.

A Happy Relationship between a bacterium and a pea plant

A Gram negative bacterium called *Rhizobium leguminosarum* can induce the formation of root nodules on leguminous plants, such as peas and clover

Clover Root Nodule

Pea Root Nodule



Single colonies of *Rhizobium leguminosarum* were isolated from pea and clover nodules



Inside the root nodule, *Rhizobium* can take atmospheric nitrogen and convert it to ammonia which can then be used by the plant.

4.

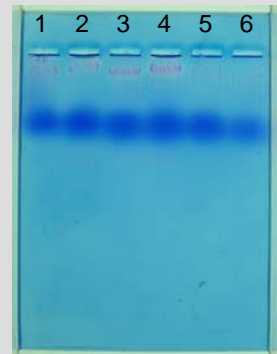
DNA

DNA (deoxyribonucleic acid) was isolated from pea seeds and from the bacterium *Rhizobium leguminosarum*.

The DNA was analysed using DNA gel electrophoresis followed by staining with Azure A dye.

DNA has a net negative charge and when a current is applied to DNA loaded onto an agarose gel, the DNA migrates to the positive electrode.

Lane



The DNA can be seen in the gel image above as red bands. Lanes 1 3 and 5 contain pea plant DNA and lanes 2, 4 and 6 contain bacterial DNA

We could see that the DNA isolated from the pea seeds and the bacteria looked very similar when analysed in this way, and yet the DNA codes for two very different organisms!

