WHAT SUBSTANCES CAN INFLUENCE THE GROWTH OF BACTERIA?

***Aim*:** To investigate what common substances influence the growth of bacteria.

Background Information:

- Bacteria are microorganisms that exist on all surfaces in different shapes with different properties.Reproduced by binary fission when a single bacterium splits its cell into two copies, and each copy reciprocates this process.

Hypothesis:

- All substances will impede the growth of bacteria with varying effectiveness, except distilled water. Substances containing alcohol are better inhibitors of bacteria than natural substances.

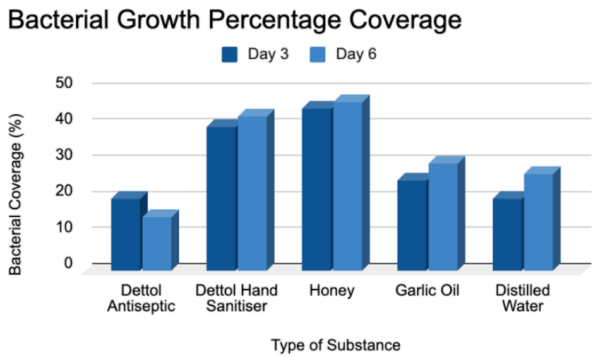
Method:

- 5 substances: Dettol antiseptic, Dettol hand sanitiser, honey, garlic oil, and distilled water.
- Prepare agar plates in Petri dishes to observe bacterial growth.
- Dip the cotton swab in a vial containing the bacteria [bacillus subtilis 168] and evenly spread on the surface of the agar plates.
- Dip the small filter paper in each of the 5 solutions using forceps before placing them in the center of the agar plate.
- Label plates and seal with tape before being left alone to let the bacteria grow.
- Results and observations were recorded after 3 days and 6 days.

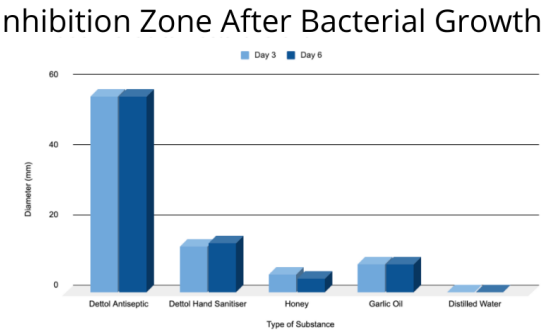
Bacterial Growth After 6 days

Data Graphs::

Agar plate	Common substance added to bacteria	Observation after 3 days (% coverage)	Observation after 6 (% coverage)	Inhibition zone - diameter measured in mm. (3 days)	Inhibition zone - diameter measured in mm. (6 days)
1	Dettol Antiseptic	20%	15%	56mm	56mm
2	Dettol Hand Sanitiser	40%	43%	13mm	14mm
3	Honey	45%	47%	0mm	0mm
4	Garlic Oil	25%	30%	0mm	0mm
5	Distilled Water	20%	27%	0mm	0mm



Inhibition Zone: a circular region in which bateria colonies are unable to grow



Bacterial Growth After 3 days

Observations:

- **Honey:** The inhibition zone was at 0mm after 3 days and stayed the same after 6 days of growth.
- **Garlic Oil:** Had no inhibition zone for both days.
- **Distilled Water:** Had an inhibition zone of 0mm for both 3 and 6 day.
- **Antiseptic:** Had an inhibition zone of 56mm after 3 and 6 days.
- **Dettol Hand Sanitiser:** After 3 days the inhibition zone was 13mm growing to 14mm after 6 days. (As the bacteria wasn't properly applied, the effectiveness of the substance wasn't as effective.)

Conclusion:

Substances containing antimicrobial alcohol solutions managed to inhibit the growth of bacteria more than substances without those properties. Natural substances like honey and garlic oil showed little to no bacteria resistance. Distilled water had no effect on the growth of bacteria, because it had no other chemical -- that acts against bacteria. The stronger the alcohol the larger the inhibition zone came to be.