**Safety and Science/Pūtaiao: Guidance for Aotearoa New Zealand Schools and Kura (**[**https://scienceonline.tki.org.nz/Media/Files/Safety-and-Science-Putaiao-Guidance-for-Aotearoa-New-Zealand-Schools-and-Kura**](https://scienceonline.tki.org.nz/Media/Files/Safety-and-Science-Putaiao-Guidance-for-Aotearoa-New-Zealand-Schools-and-Kura)**)**

33.6 What should I be aware of when culturing microorganisms?

● Human or animal sources of microorganisms, other than skin, should not be used (for example, blood, saliva, pus, urine, and faecal material).

● Skin surfaces may be used only if cultures remain sealed.

● Samples should not be taken from toilets and toilet areas, including sinks and door handles.

● Known pathogens, other than genetically crippled strains of Escherichia coli, should not be used.

● Samples should not be taken from rubbish bins and drinking taps.

● Sterile swab sticks should be used to inoculate plates.

● All cultures should be labelled with student names and the date.

● Petri dishes should be covered and sealed to prevent contamination and the spreading of spores. Adhesive tape can be used to securely seal the dishes.

● Petri dishes should be incubated upside down.

● Subculturing should be carried out only on known non-pathogenic organisms that can be obtained commercially.

● Lids of petri dishes must be held open, at an angle to the base, for the minimum time that allows a transfer of material.

● All microbiological transfers should be conducted close to a Bunsen burner flame. Safety glasses should be worn.

**● Incubating at 25 to 40 degrees Celsius (°C) should be avoided because this tends to select organisms adapted to the human body. Temperatures of 25°C or below should be used.**

● Glassware used for fermentation experiments must either be lightly plugged with cotton wool or be covered with aluminium foil and not sealed.

● All cultures should be destroyed before disposal by heating in a pressure cooker for at least twenty minutes.

● Plastic dishes must be disposed of or could be soaked in a 10% hypochlorite (bleach) solution for three days.

● Spillages of cultures should be dealt with by a teacher or technician wearing disposable gloves. The broken container and/or spilled culture should be covered with a cloth soaked in a disinfectant of 10% hypochlorite (household bleach). After ten minutes the spillage must be cleared away using paper towels and a dustpan. The contaminated material should be placed in a disposal bag, along with the gloves, and then be disposed of. The dustpan should also be disinfected.

33.6.1 Which microorganisms are suitable to use in school?

● soil microorganisms (for example, Azotobacter spp.)

● vinegar-producing microorganisms (for example, Acetobacter spp.)

● baker's yeast

● mildew and rust from plants

● yoghurt bacteria

● cheese bacteria and fungi

● some fungal diseases on plants and rotting fruits

● potato blight

● black spot on roses

● yeasts from grapes

● fungi from jams and jellies.

Note: Some microorganisms that are part of the normal flora of humans or animals may be pathogenic for immuno-compromised persons.