

# Why do they put mint in toothpaste? Would garlic be better

Each group of students will need:	Notes
Agar plate seeded with bacteria (Suggested organisms are: <i>Bacillus subtilis</i> , <i>E. coli</i> and <i>Staphylococcus albus</i> .) The last named organism has been known to infect individuals who are debilitated or taking immuno-specific drugs. Ensure no one using it is at such a risk.	<b>It is essential</b> that the plates are used for the investigation an hour or so after the agar has set, otherwise once the bacteria have started to grow they will be unaffected by the antimicrobial agent. Therefore it may be more suitable for students to prepare their own plates. Notes on the preparation of the agar plates are provided on the additional sheet 'Pouring agar plates'. Bacteria can all be obtained from Biological suppliers or NCBE. Notes on the preparation of the broth culture are given below.
Plant material (garlic and mint)	Garlic and mint are suggested because of the questions posed in the title of the activity but a range of different plant material could be tested.
Pestle and mortar	
10 cm <sup>3</sup> industrial methylated spirits [HIGHLY FLAMMABLE] [TOXIC]	
Pipette (sterile)	
Paper discs (e.g. Whatman antibiotic assay paper discs)	New filter paper cut using a hole punch could be used.
Sterile Petri dish	
Sterile forceps	
Tape	
Marker pen	
Incubator set at 25 °C	

## Making a broth culture

It is likely that the bacteria will be sent as slope cultures. To make a broth culture the following procedure can be used.

- 1 Flame the neck of the culture. Allow to cool in the air for a few seconds after flaming. Scrape off a small amount of bacteria from the surface using a sterile inoculation loop. Transfer this to a batch of sterile nutrient broth, having first flamed the neck of the broth container.
- 2 Incubate the broth until it becomes turbid. A suitable temperature is 25 °C. The temperature must not exceed 30 °C. This might take 2–3 days with some bacteria. *E. coli* grows fastest.
- 3 To make up the agar plates, use about 1 ml of bacterial broth for each sterile Petri dish.

Guidance on microbiology is available in the ASE publication **Topics in Safety, 3rd Edition** (2001) and **Microbiology: an HMI Guide for Schools and FE**, HMSO, 1990.