*This is the **Foundation Separate** version — Higher Tier content has been removed.*

Antibiotics are drugs that kill bacteria inside the body without harming body cells. Painkillers relieve symptoms but do not kill pathogens.

Required Practical: Aseptic technique: culturing bacteria on agar plates, placing antibiotic discs, measuring zones of inhibition after incubation.

- Antibiotics kill or inhibit the growth of bacteria. They do NOT work against viruses.
- Why not against viruses: antibiotics target bacterial-specific structures (cell walls, ribosomes). Viruses have no cell wall and use host cell ribosomes — targeting them would kill host cells.
- Antibiotic resistance: a serious global health threat. Bacteria can evolve resistance through natural selection.
- Mechanism: random mutations give some bacteria resistance → antibiotic kills non-resistant bacteria → resistant bacteria survive and reproduce → population becomes resistant.
- MRSA (methicillin-resistant Staphylococcus aureus): resistant to most common antibiotics. Major problem in hospitals.
- Reducing resistance: only prescribe antibiotics when necessary, complete the full course, avoid using antibiotics in farming where possible.
- Painkillers (e.g. paracetamol, ibuprofen): treat symptoms (e.g. pain, fever) but do not kill pathogens.

Key Terms

Antibiotic	A drug that kills bacteria or inhibits their growth — does not work against viruses
Antibiotic resistance	Ability of bacteria to survive antibiotic treatment — evolved through natural selection
MRSA	Methicillin-resistant Staphylococcus aureus — resistant to most common antibiotics
Painkiller	A drug that relieves symptoms (pain, fever) without killing pathogens

■ **Exam Tip:** ANTIBIOTICS kill BACTERIA. They do NOT kill viruses. This is one of the most commonly tested facts in GCSE Biology. For antibiotic resistance questions: always use the words natural selection, mutation, and resistant bacteria survive and reproduce.