*This is the **Higher Separate** version — includes all Higher Tier content (marked ★) and all Separate Science content.*

Viruses cause disease by invading host cells and replicating inside them, destroying the cells in the process.

- Measles: virus spread by droplets. Symptoms: fever, red skin rash. Serious — can be fatal, especially in young children. Prevented by MMR vaccine.
- HIV (Human Immunodeficiency Virus): spread by sexual contact or infected blood (e.g. sharing needles). Attacks white blood cells (CD4+ T cells), weakening the immune system. Leads to AIDS.
- AIDS (Acquired Immunodeficiency Syndrome): the late stage of HIV infection when the immune system is severely compromised → opportunistic infections become life-threatening.
- HIV is treated with antiretroviral drugs which slow progression but cannot cure. Condoms prevent sexual transmission.
- Tobacco Mosaic Virus (TMV): infects plants. Mosaic pattern on leaves — disrupts chlorophyll production. Reduces photosynthesis → reduces growth.
- ★ **HT** Influenza virus: constantly mutates (antigenic variation) — new strains require new vaccines each year.

Key Terms

HIV	Human Immunodeficiency Virus — attacks CD4+ T helper lymphocytes, leading to AIDS
AIDS	Acquired Immunodeficiency Syndrome — late stage HIV infection where immune system fails
Antiretroviral drugs	Drugs that slow HIV replication — cannot cure HIV but prevent progression to AIDS
TMV	Tobacco Mosaic Virus — infects plants, disrupts chlorophyll, reduces photosynthesis

■ **Exam Tip:** For HIV/AIDS questions: HIV = the virus; AIDS = the condition that results when the immune system fails. HIV attacks CD4+ T cells — this is what makes the immune system fail. Know how each viral disease spreads and how it is prevented.