

CHAPTER 2

Biological Classification

CBSE · Biology · Class 11

WHAT THIS CHAPTER DOES

Boards prep that builds confidence, not anxiety.

TODAY'S MISSION

Today's mission

WHY THIS MATTERS

The big picture — life is huge, classification is the map

WORKED EXAMPLE

How classification has evolved (350 BCE → 1990)



TOPIC

Whittaker's five criteria (1969)

TOPIC

The five-kingdom comparison table (the spine of this chapter)

TOPIC

A

Part A — Kingdom Monera

TOPIC

Monera — the **ONLY** prokaryotic kingdom

POINT 1

POINT 2

POINT 3

POINT 4

TOPIC

Archaeobacteria — life in extreme places

TRY IT · SOLVE BEFORE YOU PEEK

Quick test — Monera

Work it out before you flip the answer.

SOLUTION

TOPIC

B

Part B — Kingdom Protista

TOPIC

Protista — the eukaryotic 'starter pack'

POINT 1

POINT 2

POINT 3

POINT 4

TOPIC

Protozoa — the heterotrophic protists

TOPIC

C

Part C — Kingdom Fungi

TOPIC

Fungi — the decomposers of the planet

POINT 1

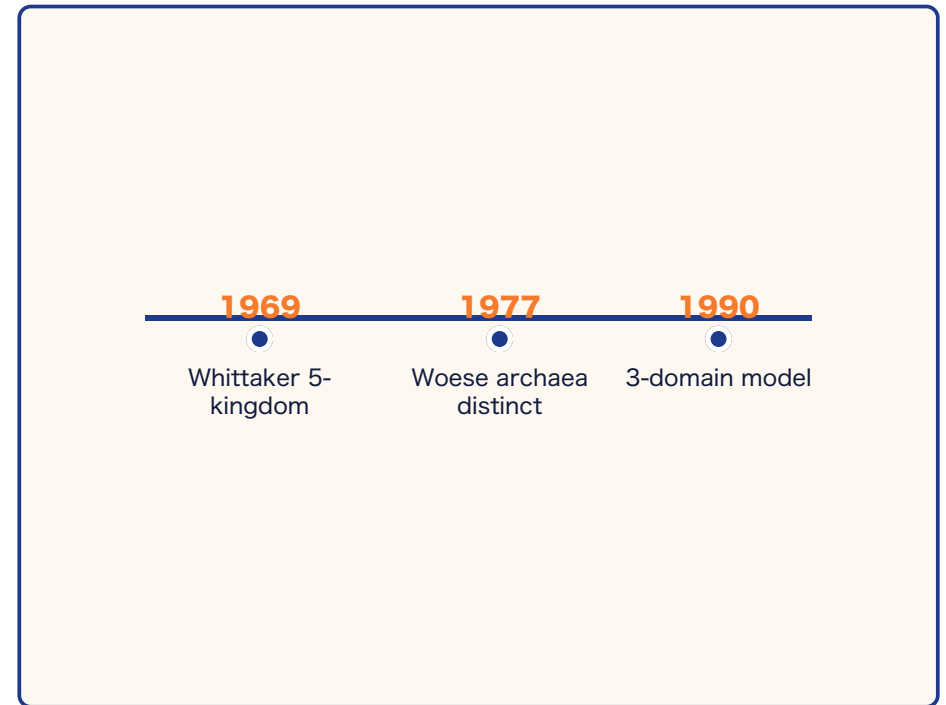
POINT 2

POINT 3

POINT 4

WORKED EXAMPLE

Worked example: identifying the kingdom



TRY IT · SOLVE BEFORE YOU PEEK

Quick test — Fungi

Work it out before you flip the answer.

SOLUTION

TOPIC

D

Part D — Plantae, Animalia & the misfits

TOPIC

Plantae & Animalia — covered briefly here, deeply in Ch 3 & 4

POINT 1

POINT 2

POINT 3

TRY IT · SOLVE BEFORE YOU PEEK

Pause — kingdom recall

Work it out before you flip the answer.

SOLUTION

TOPPER TEMPLATE · MARK-BY-MARK

Topper-grade 5-mark answer — the 5-kingdom comparison

PYQ PATTERNS

PYQ pattern map — what CBSE has actually asked

MARKS DISTRIBUTION

Sub-topic marks weight (last 5 years)

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Viruses are living organisms because they reproduce.

✓ **CORRECT** Viruses are obligate intracellular parasites — they replicate ONLY inside a host cell using host machinery. Outside, they exist as crystallisable nucleoprotein particles with no metabolism. They are a 'link' between living and non-living, NOT fully alive.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Viroids and prions are the same thing — both are 'sub-viral'.

✓ **CORRECT** Viroids are free RNA molecules (NO protein coat) — first found in Potato Spindle Tuber disease by T.O. Diener (1971). Prions are abnormally folded PROTEINS with NO nucleic acid — cause CJD, mad cow disease. Opposite biochemistry — never mix them up.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Lichens are a single organism — a kind of moss or fungus.

✓ **CORRECT** Lichens are a SYMBIOTIC ASSOCIATION between two organisms: an alga (photosynthetic partner, the phycobiont) and a fungus (the mycobiont). They are not a kingdom — they're a relationship.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** All bacteria are harmful pathogens.

✓ **CORRECT** Most bacteria are harmless or beneficial — nitrogen-fixers (Rhizobium), gut commensals (E. coli), curd-formers (Lactobacillus), antibiotic producers (Streptomyces). Only a small fraction cause disease.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Mycoplasma have a cell wall like other bacteria.

✓ **CORRECT** Mycoplasma are the SMALLEST living cells (~0.3 μm) and the ONLY prokaryotes that LACK a cell wall. They can survive without oxygen (facultatively anaerobic) and cause diseases in many animals.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Slime moulds are fungi (because they are moulds).

✓ **CORRECT** Slime moulds are PROTISTS, not fungi. They have a saprophytic feeding stage (plasmodium = multinucleate mass of protoplasm) and a fruiting-body spore stage. Whittaker placed them in Protista based on cell organisation, not appearance.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** Cyanobacteria are algae because they photosynthesise and live in water.

✓ **CORRECT** Cyanobacteria (blue-green algae) are PROKARYOTES (Kingdom Monera). They are photoautotrophs with chlorophyll-a, but they have NO membrane-bound organelles, NO true nucleus. True algae are eukaryotes in Protista/Plantae.

TOPIC

Trap

TRAP → TRUTH

× **MISTAKE** The five-kingdom system is universally accepted and is the final word.

✓ **CORRECT** It is the CBSE/NCERT standard but it has been superseded in scientific use by Carl Woese's THREE-DOMAIN system (1990) — Bacteria, Archaea, Eukarya — based on rRNA sequencing. The 5-kingdom scheme has gaps: where do viruses fit? Why are all prokaryotes lumped together when Archaea are molecularly very different from Eubacteria?

PYQ PATTERNS

Top PYQ patterns to drill

#1	Compare any THREE / FIVE features across the five kingdoms (cell type, body organisation, nutrition, reproduction, examples) (5 marks)	95%
#2	Differentiate Archaeobacteria and Eubacteria (with examples of each) (3 marks)	70%
#3	Why are viruses considered a link between living and non-living? OR	Define viroid / prion with one example each. (2 marks) — 80%
#4	What are lichens? Describe their symbiotic relationship. (2 marks)	65%
#5	Compare any TWO classes of Fungi (Phycomycetes / Ascomycetes / Basidiomycetes / Deuteromycetes) on mycelium, asexual spore, sexual spore, habitat, example. (3 marks)	55%

RECAP · MEMORISE THESE

Chapter summary — the 7 things you **MUST** carry away

1

Whittaker (1969) proposed the 5-kingdom system based on cell type, body, nutrition, reproduction, phylogeny.

2

Monera = ONLY prokaryotic kingdom (Archaea + Eubacteria).
Mycoplasma lack a cell wall.

3

Protista = ALL single-celled eukaryotes.
Chrysophytes, dinoflagellates, euglenoids, slime moulds, protozoans.

4

Fungi = heterotrophic eukaryotes with CHITIN cell wall. Four classes by sexual

5

Plantae = autotrophs with cellulose;
Animalia = holozoic

6

Outside the 5-K: virus (NA + protein), viroid (RNA only), prion (protein only).

WHAT'S NEXT

Next class — Chapter 3: Plant Kingdom



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