

# Seedless Plants



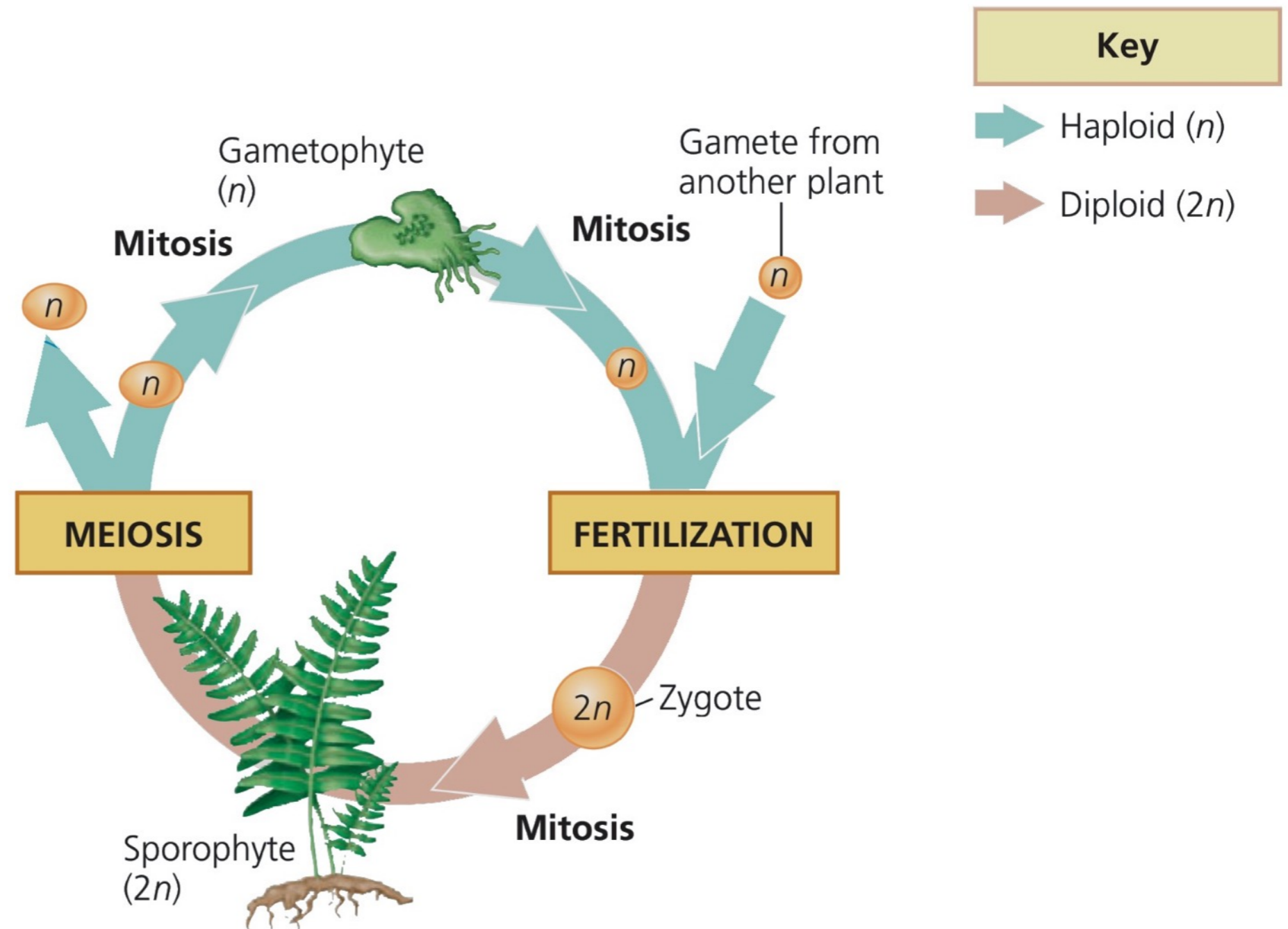
# Seedless Plants

## **Synapomorphies**

- Alternation of Generations
- Walled spores produced in sporangia
- Multicellular gamete-producing organs (gametangia)
- Apical meristems

# Seedless Plants

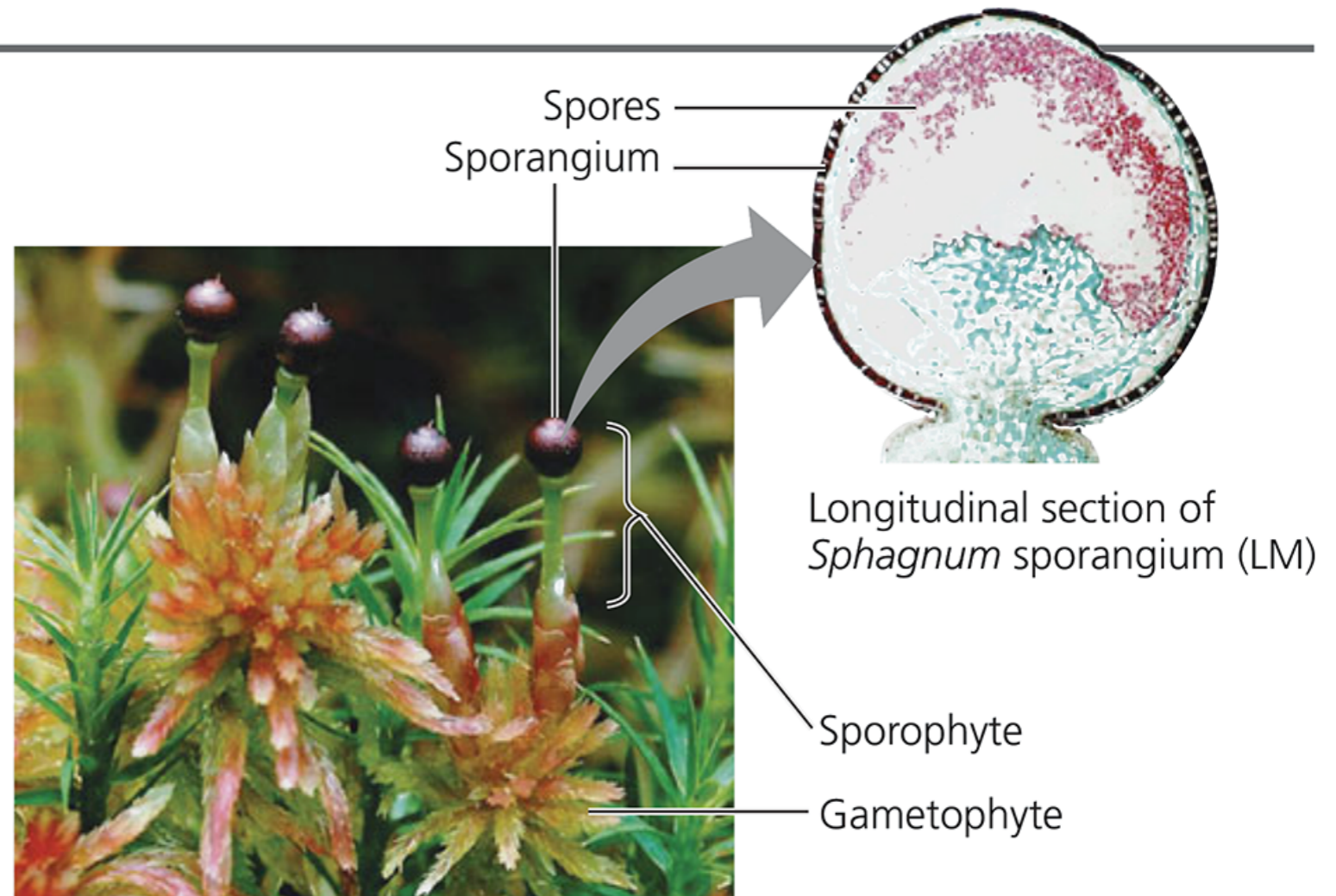
## Alternation of Generations



# Seedless Plants

## Walled Spores

- Produced in sporangia

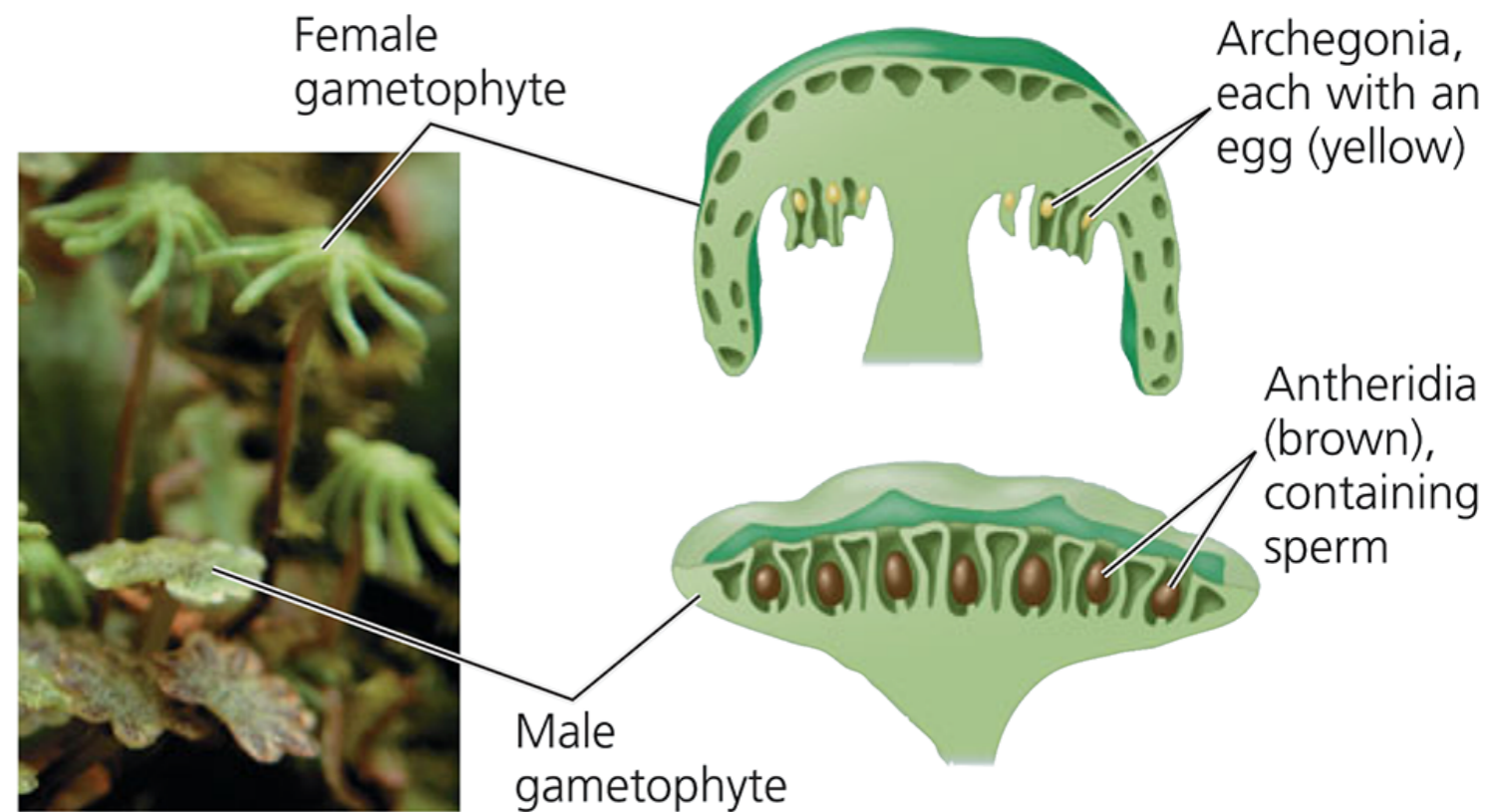


**Sporophytes and sporangia of *Sphagnum* (a moss)**

# Seedless Plants

## Multicellular Gamete-Producing Organs

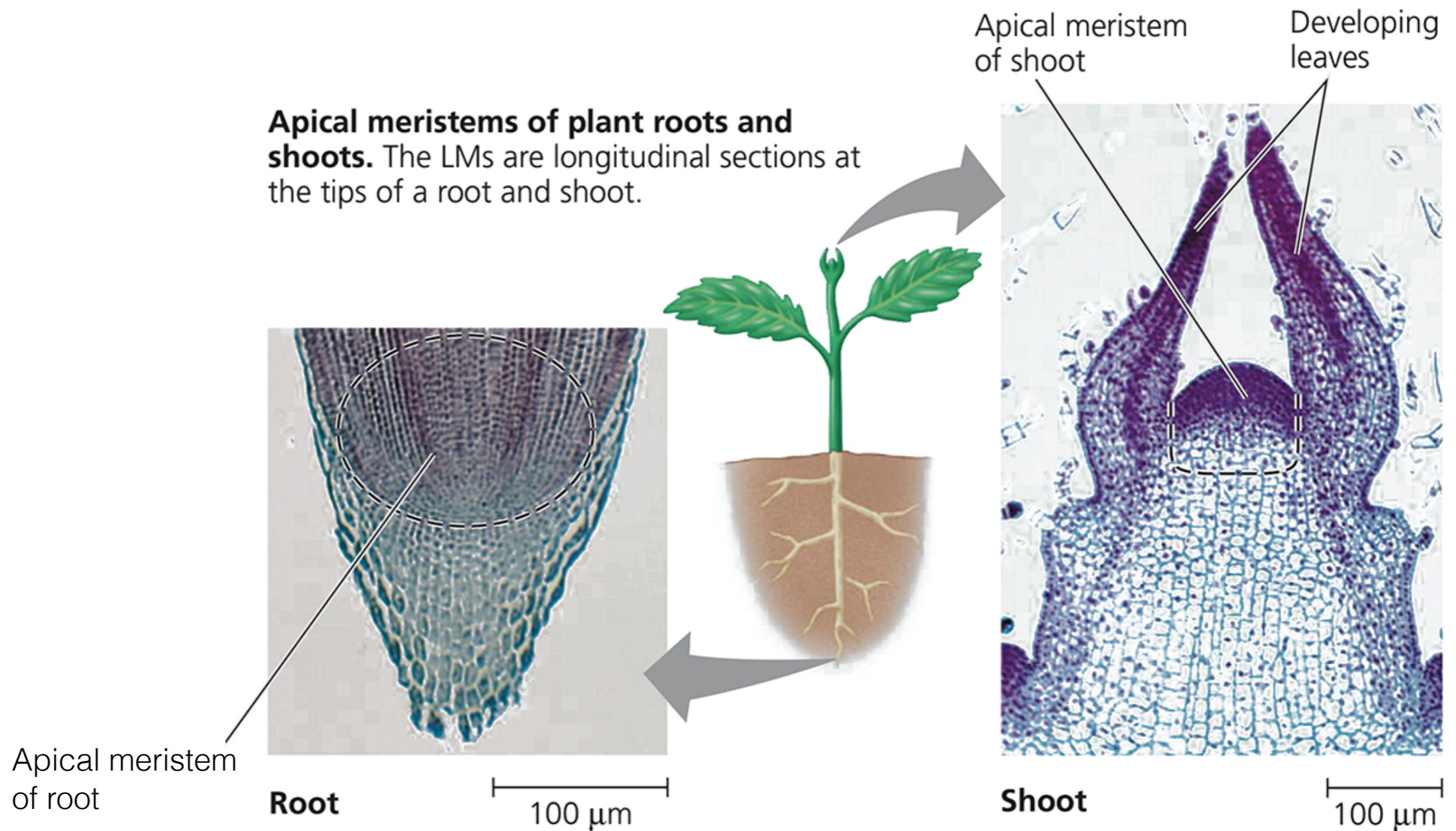
- Gametangia
  - Archegonia - female
  - Antheridia - male



Archegonia and antheridia of *Marchantia* (a liverwort)

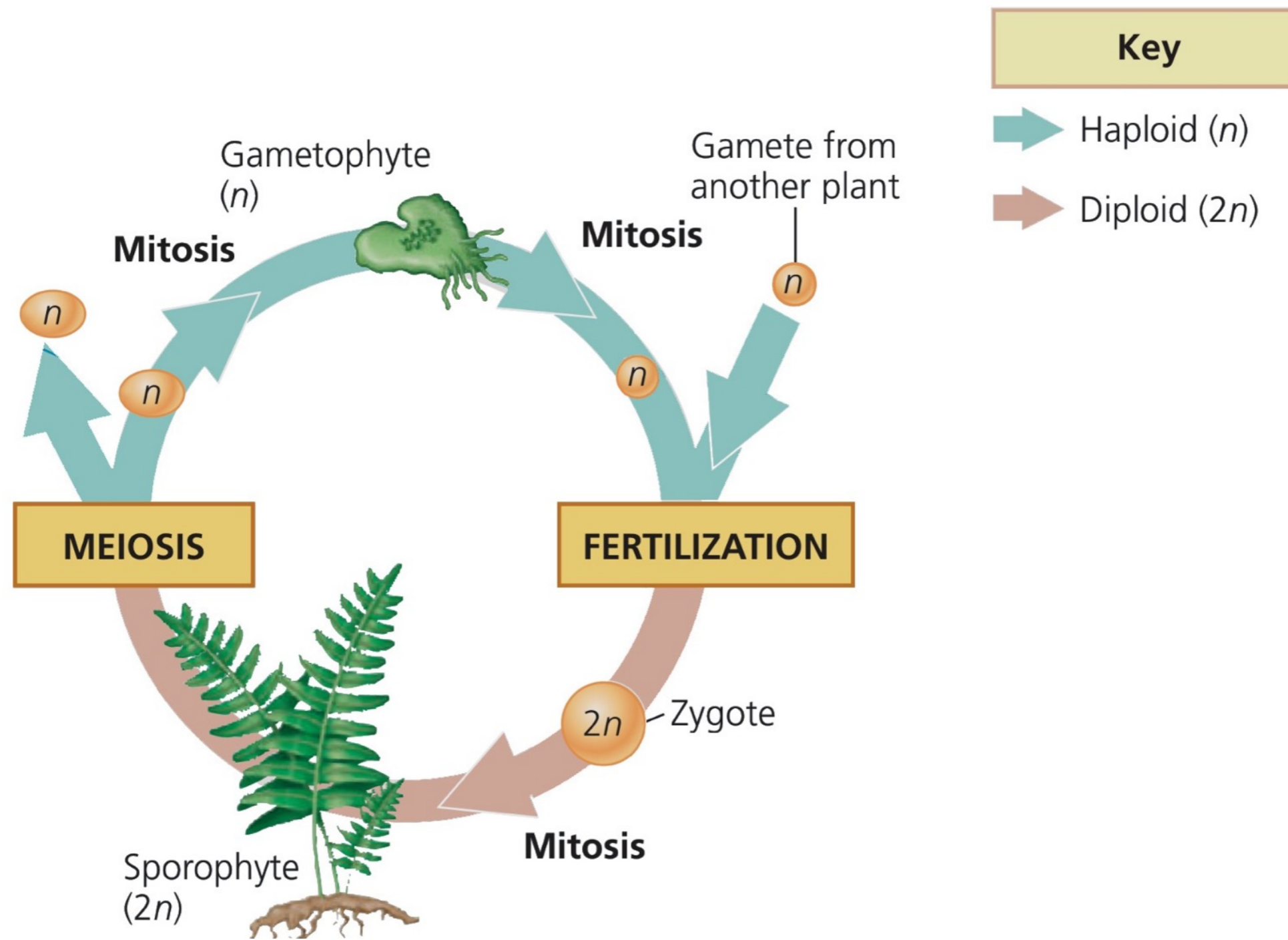
# Seedless Plants

## Apical meristems



# Seedless Plants

## A Step-by-Step Look at Alternation of Generations

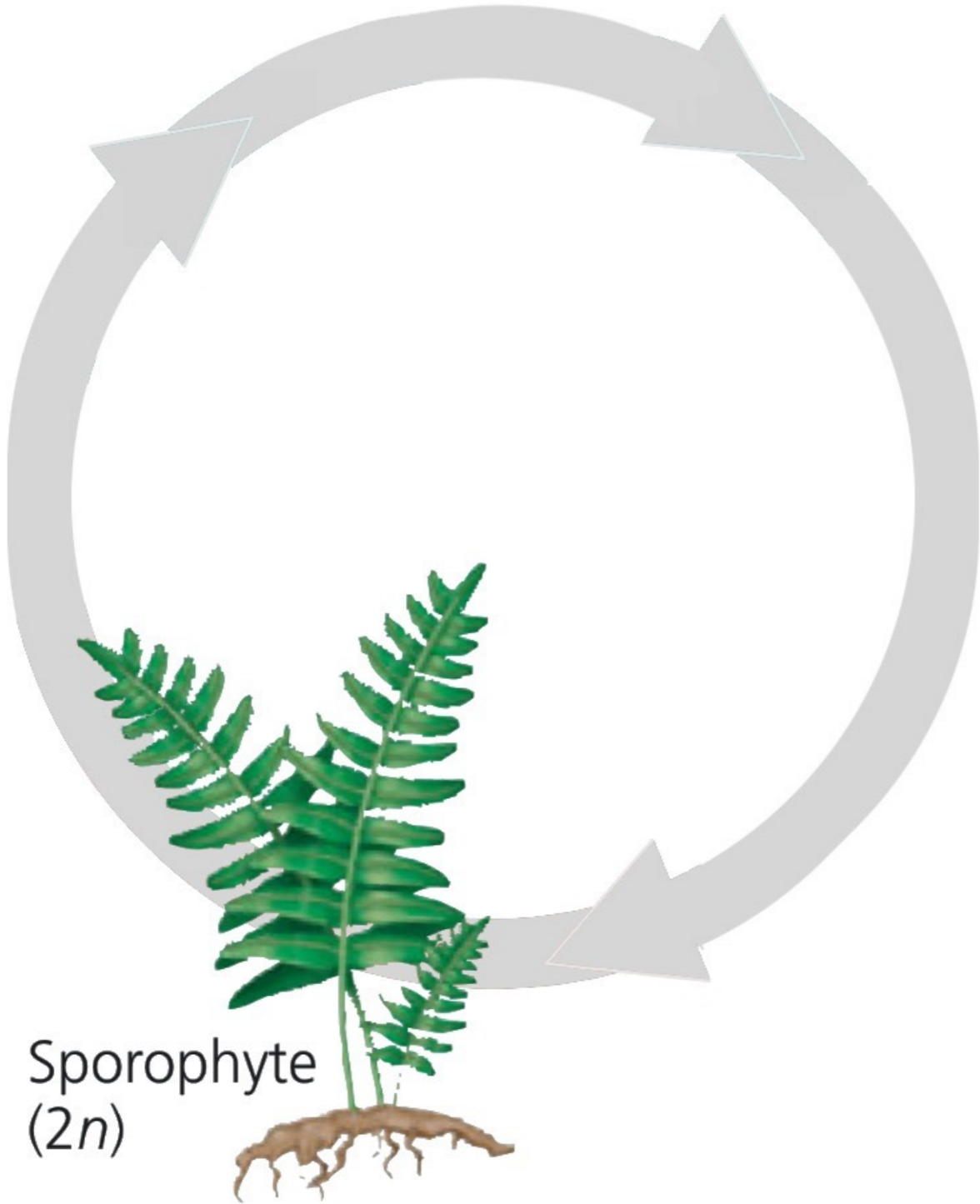


# Alternation of Generations

Key

→ Haploid ( $n$ )

→ Diploid ( $2n$ )



Sporophyte  
( $2n$ )

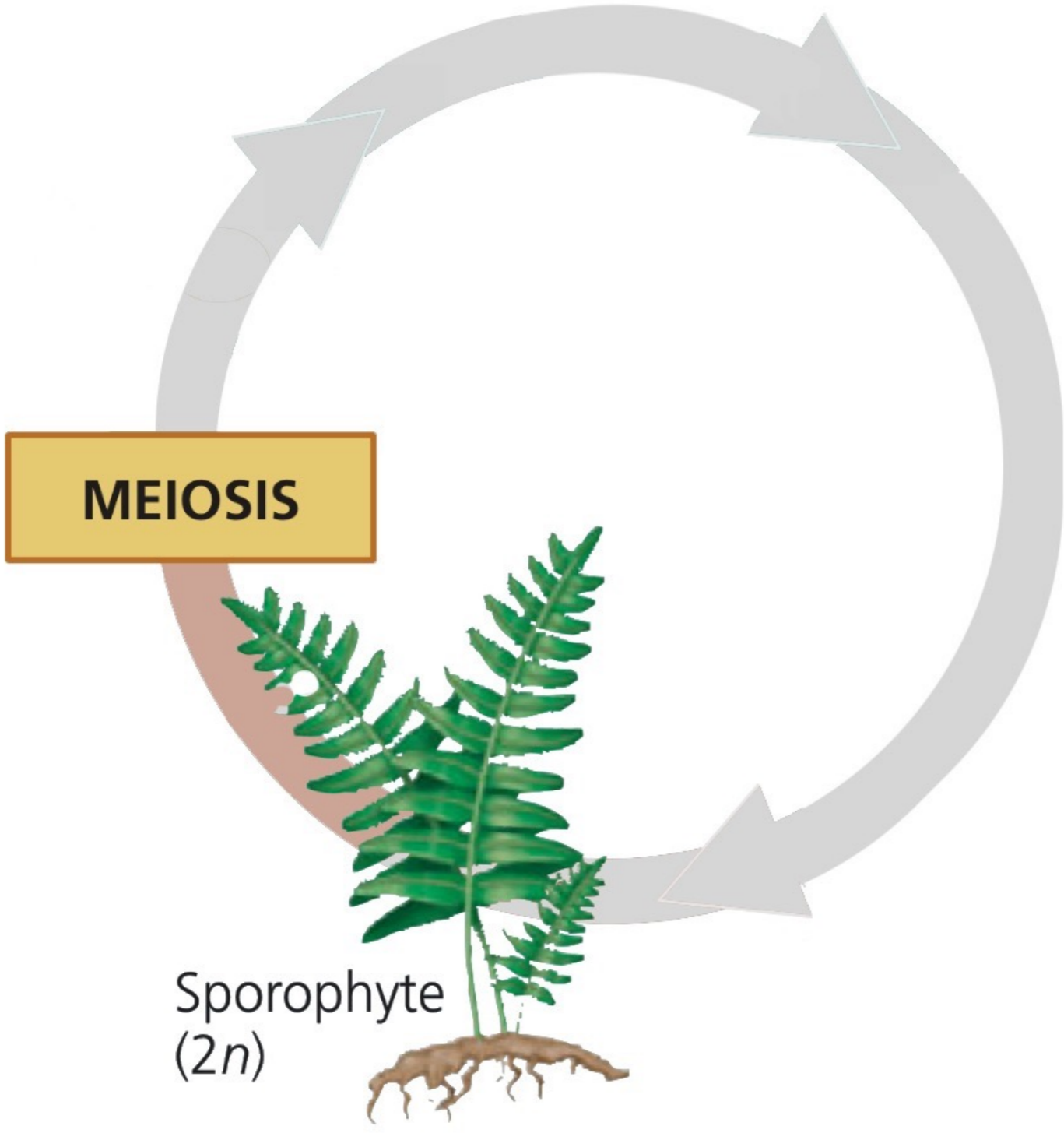


# Alternation of Generations

## Key

 Haploid ( $n$ )

 Diploid ( $2n$ )

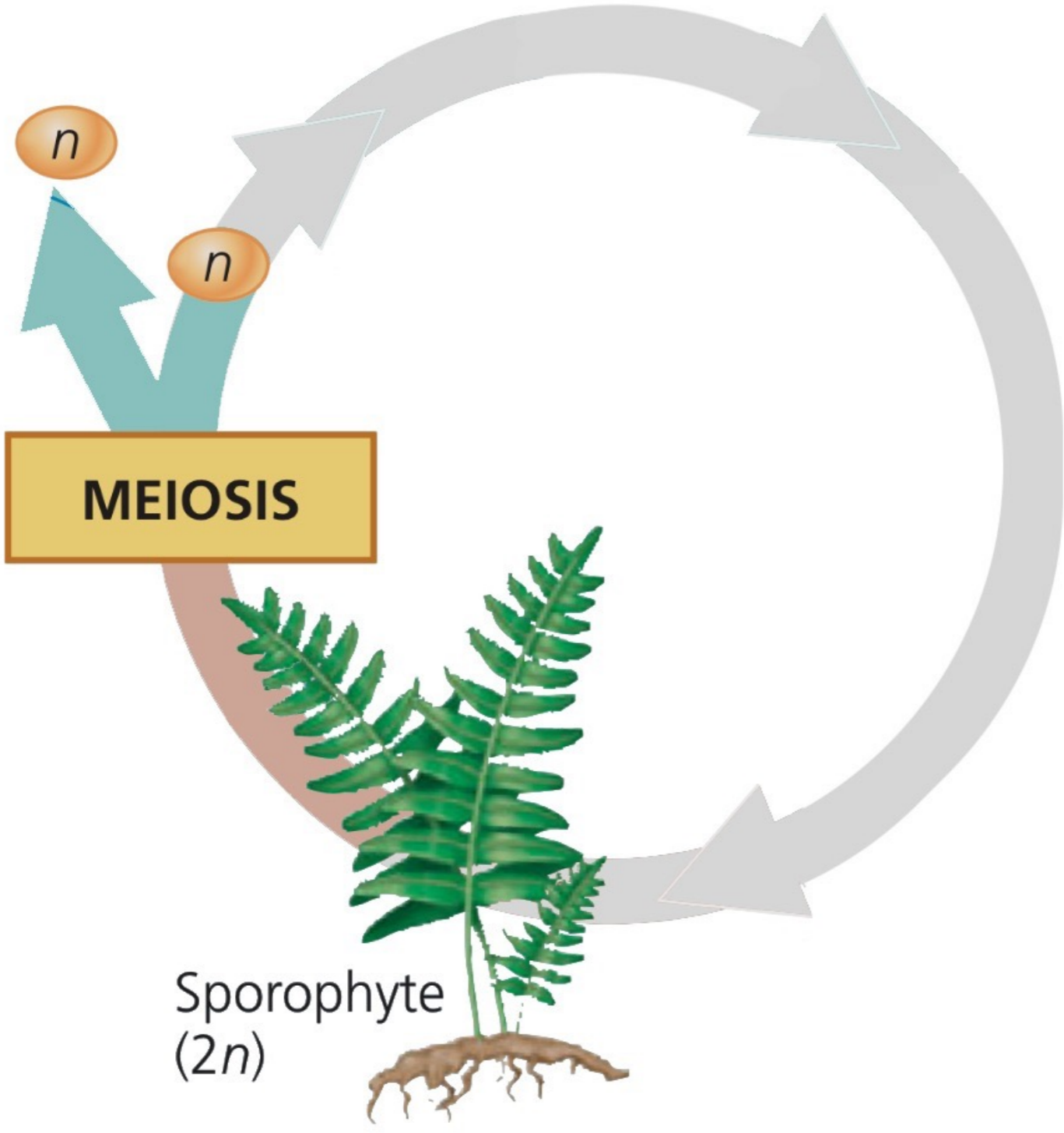


# Alternation of Generations

Key

➡ Haploid ( $n$ )

➡ Diploid ( $2n$ )

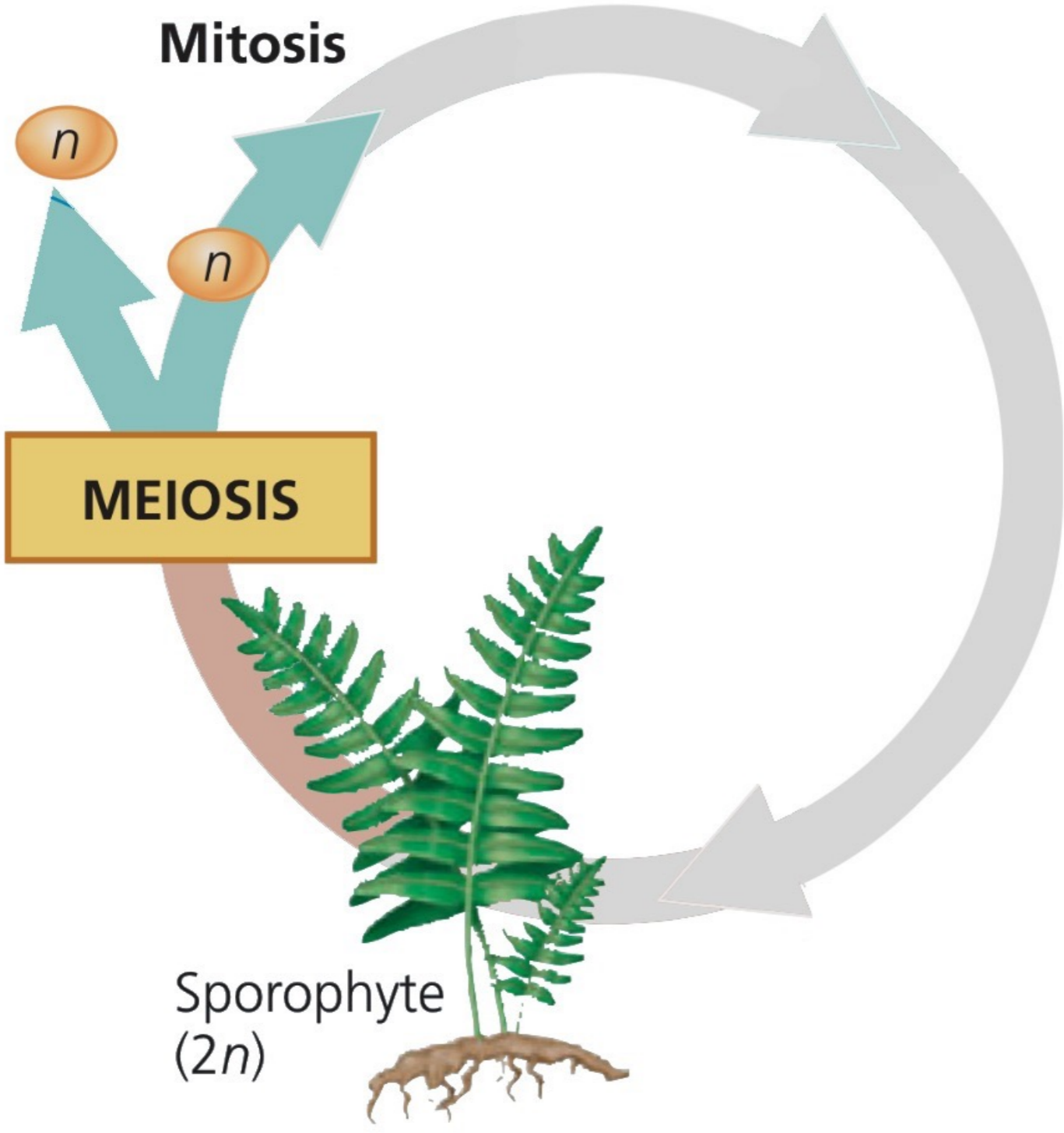


# Alternation of Generations

Key

→ Haploid ( $n$ )

→ Diploid ( $2n$ )

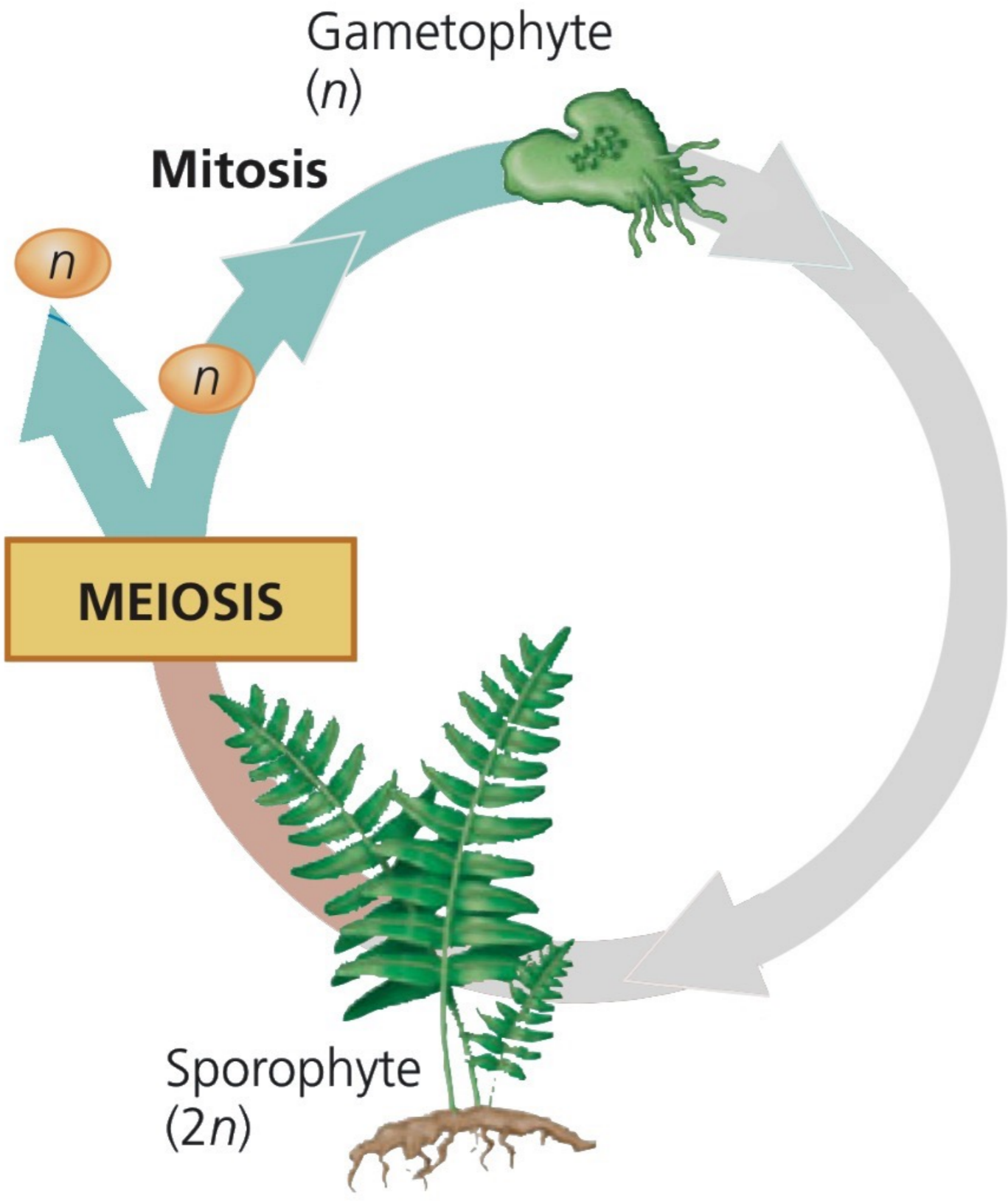


# Alternation of Generations

## Key

➡ Haploid ( $n$ )

➡ Diploid ( $2n$ )

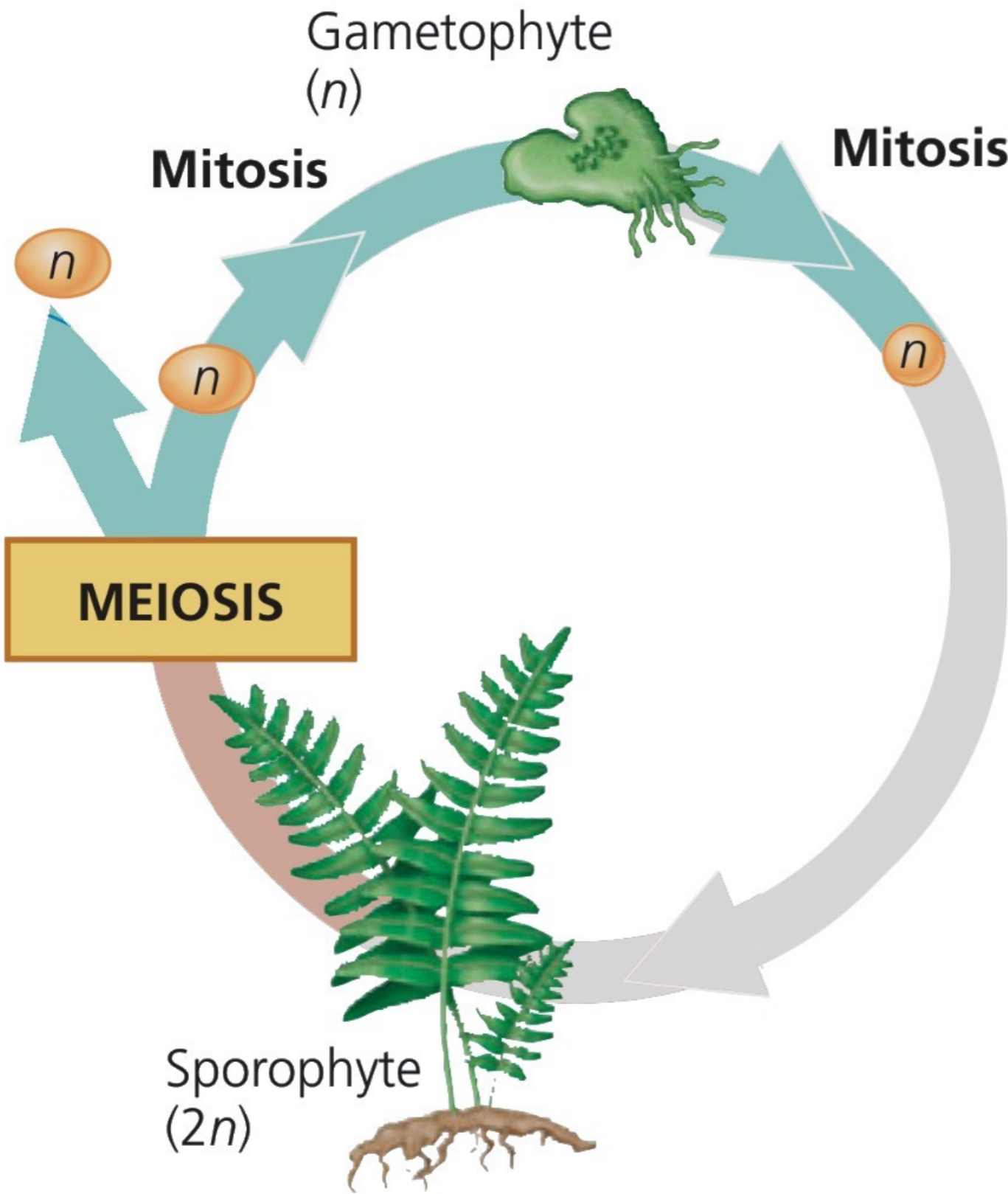


# Alternation of Generations

**Key**

➡ Haploid ( $n$ )

➡ Diploid ( $2n$ )

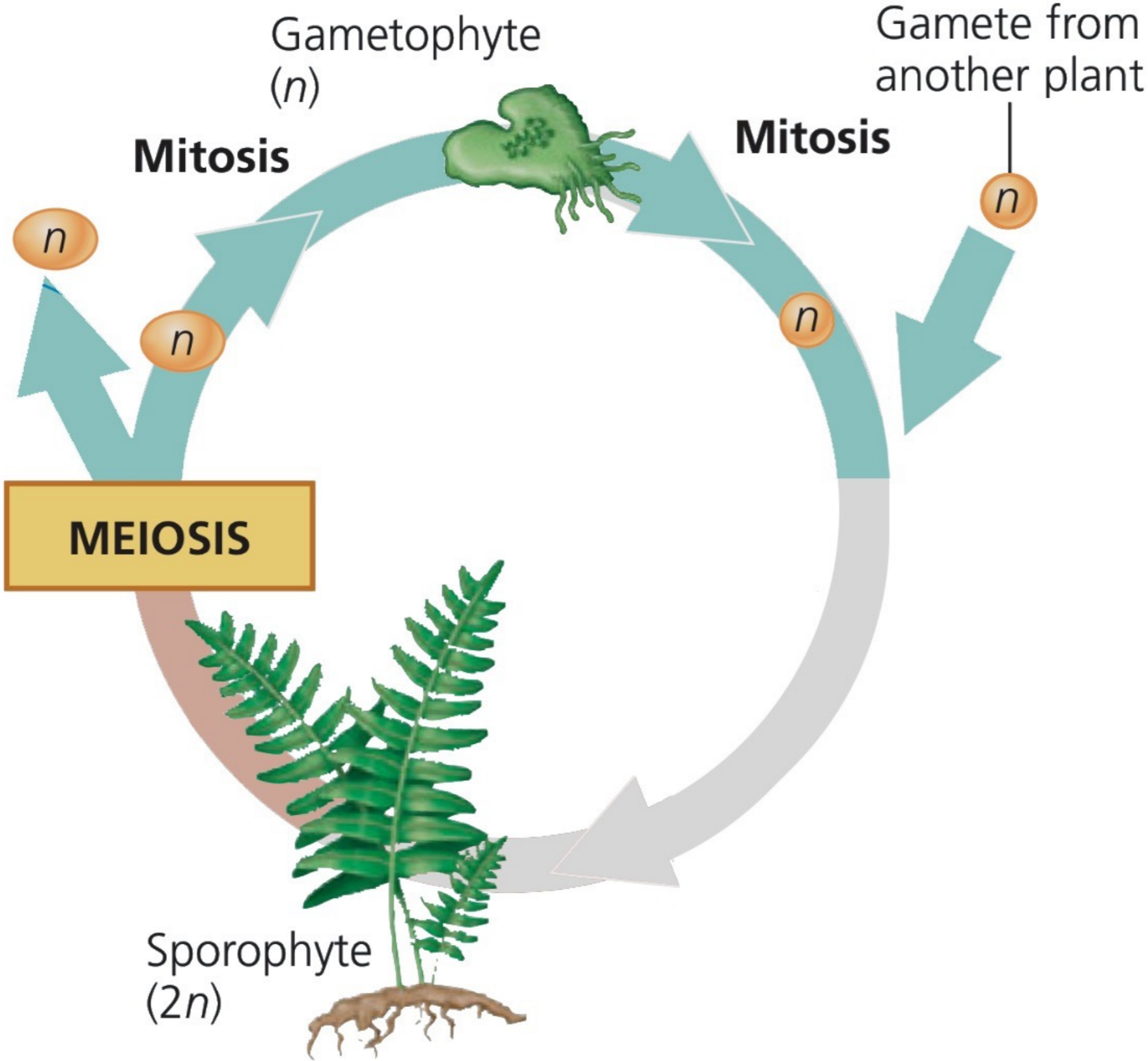


# Alternation of Generations

## Key

➡ Haploid ( $n$ )

➡ Diploid ( $2n$ )

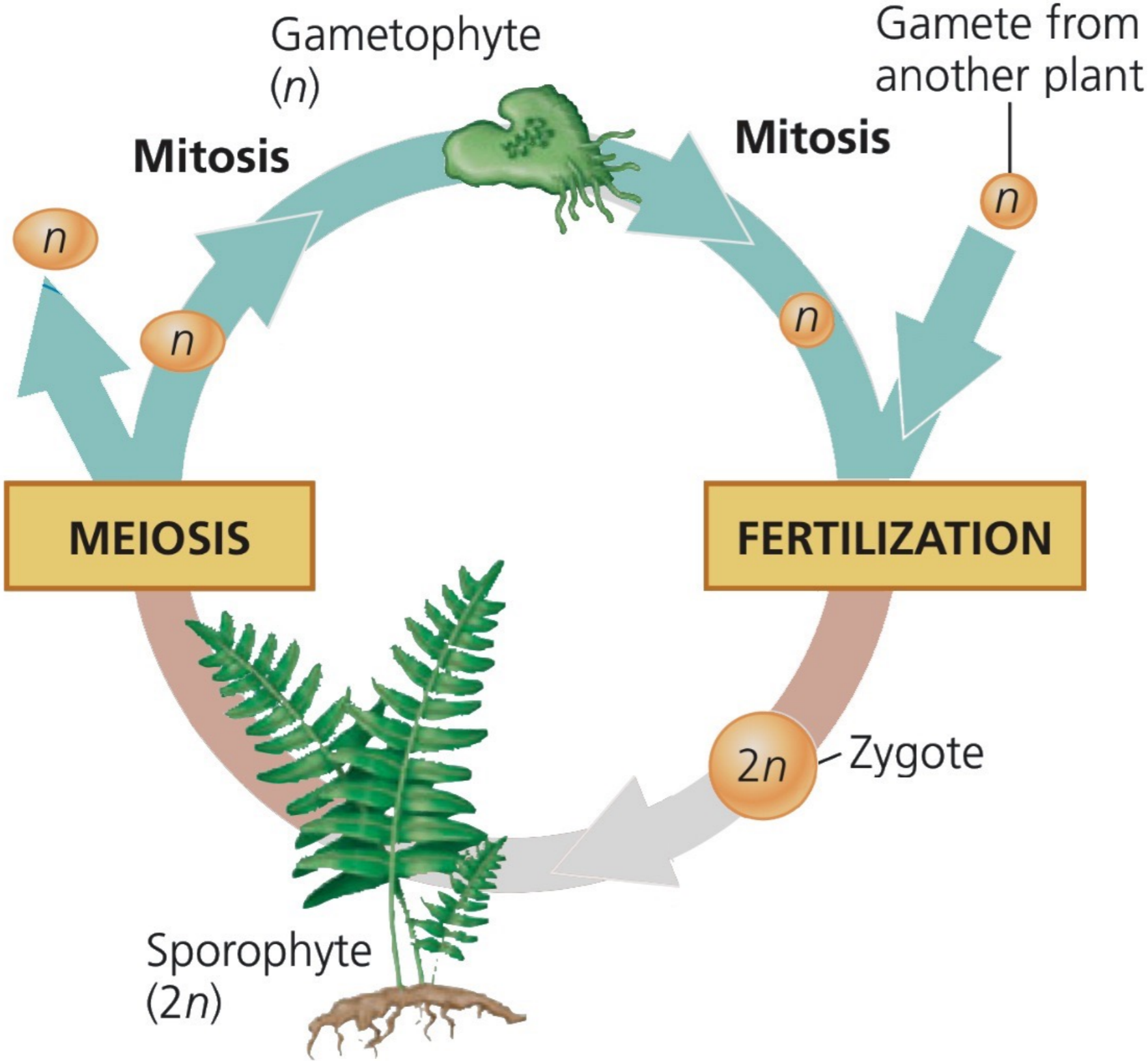


# Alternation of Generations

## Key

 Haploid ( $n$ )

 Diploid ( $2n$ )

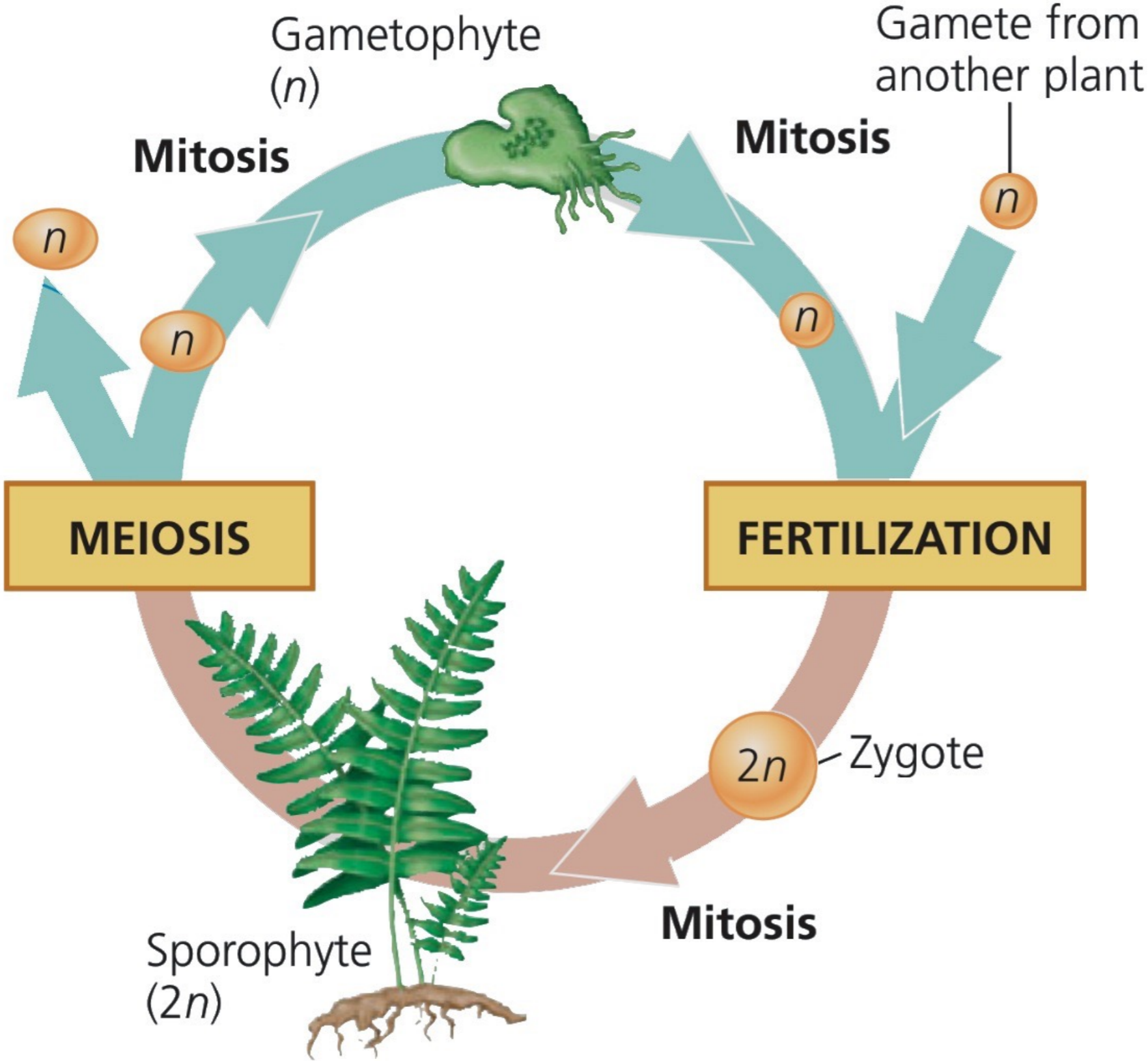


# Alternation of Generations

## Key

➡ Haploid ( $n$ )

➡ Diploid ( $2n$ )

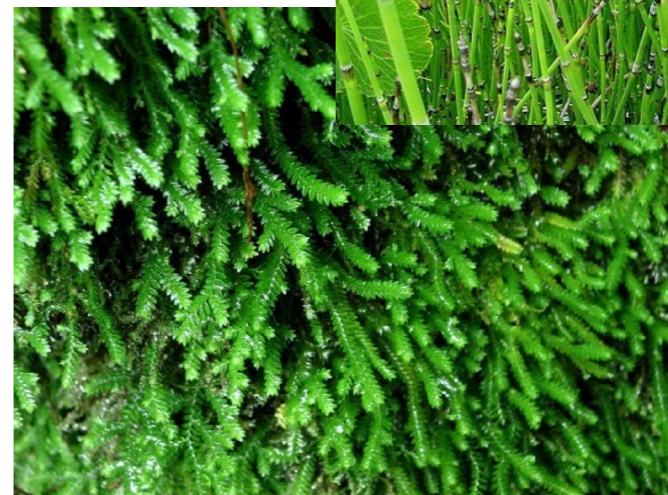




# Seedless Plants

## Phyla

- Marchantiophyta
- Bryophyta
- Anthoceroophyta
- Tracheophyta



# Seedless Plants

Marchantiophyta



# Seedless Plants

Bryophyta

- *Mnium*



# Seedless Plants

Bryophyta

- *Hypnum*



# Seedless Plants

Bryophyta

- *Dicranum*



# Seedless Plants

Bryophyta

- *Polytrichum*



# Seedless Plants

Bryophyta

- *Sphagnum*



# Seedless Plants

AnthoceroPHYta

- *Anthoceros*





# Seedless Plants

Tracheophyta

- True ferns



# Seedless Plants

Tracheophyta

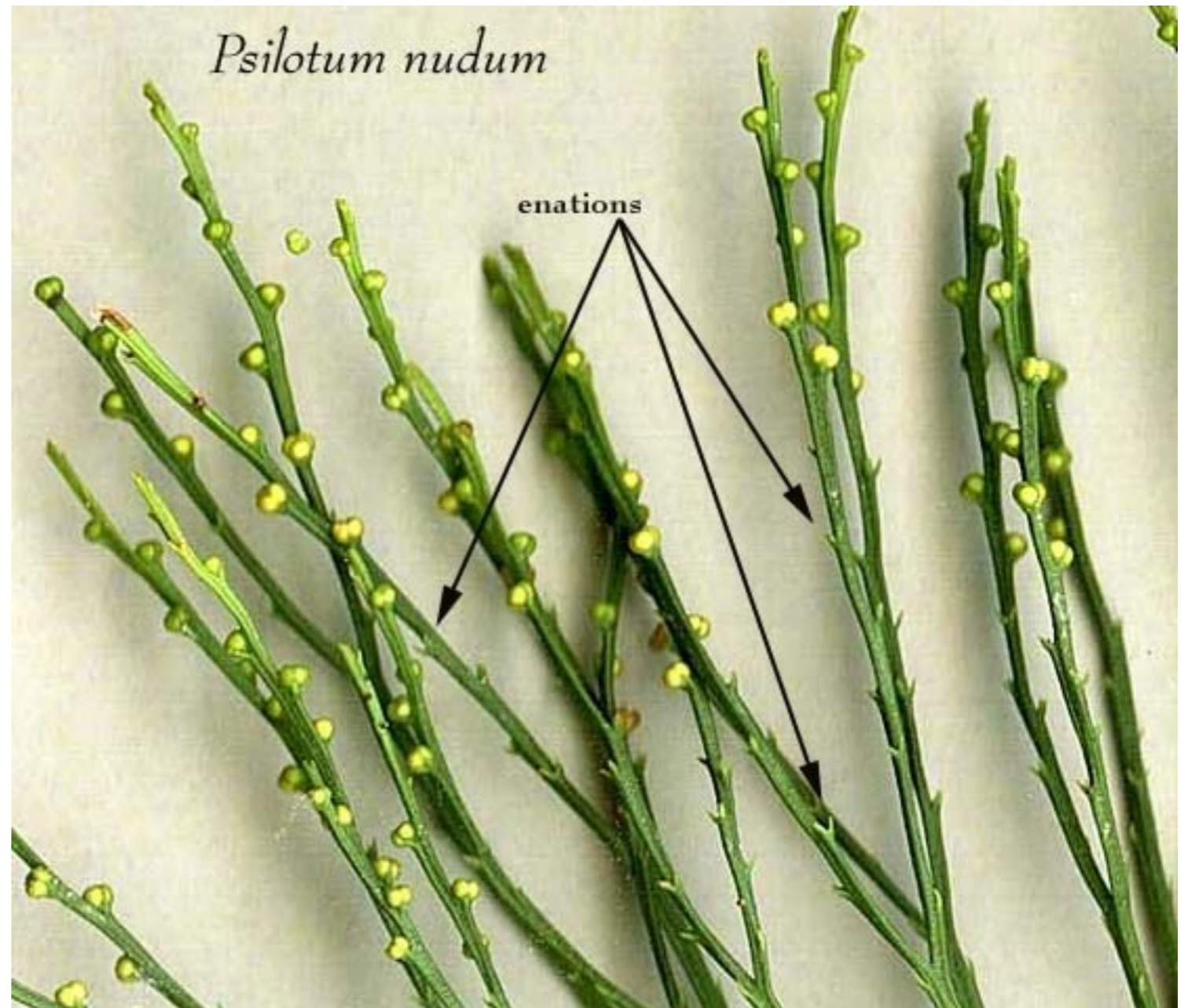
- Horsetails



# Seedless Plants

## Tracheophyta

- Wisk ferns



# Seedless Plants

Tracheophyta

- *Selaginella*

