

Plant Growth and Development

an irreversible increase in size, steered by a handful of chemical signals



Growth, the basic idea *

- an irreversible, permanent increase in size (in volume, mass or cell number), unlike a reversible change such as swelling from water uptake
- a plant keeps growing throughout its life because it retains regions of continuously dividing cells, called **meristems**, at its root and shoot tips (and in many plants, in a lateral ring too)
- growth at the cellular level runs through three phases in sequence: cell division (in the meristem itself), cell elongation (just behind it), and cell differentiation (further back still, where cells mature into their final specialised form)

Three phases of growth, one place each

Cell division

in the meristem itself; cell number increases

Cell elongation

just behind the meristem; cells enlarge, vacuoles expand

Cell differentiation

further back; cells mature into their specialised final form

meristems are why a plant, unlike most animals, never really stops growing: there is always a region of dividing cells left

