

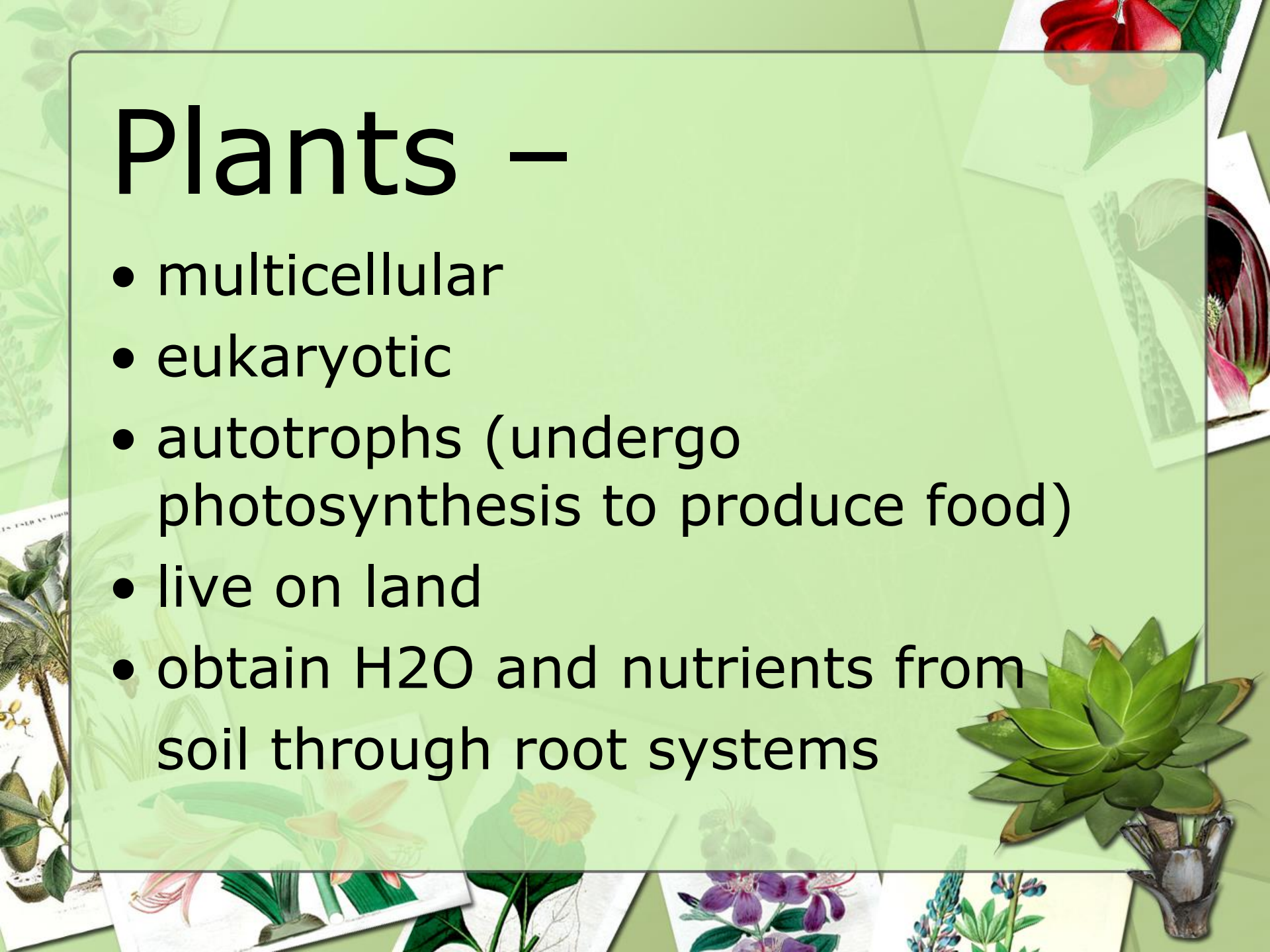
Plants

Chapters 7-8



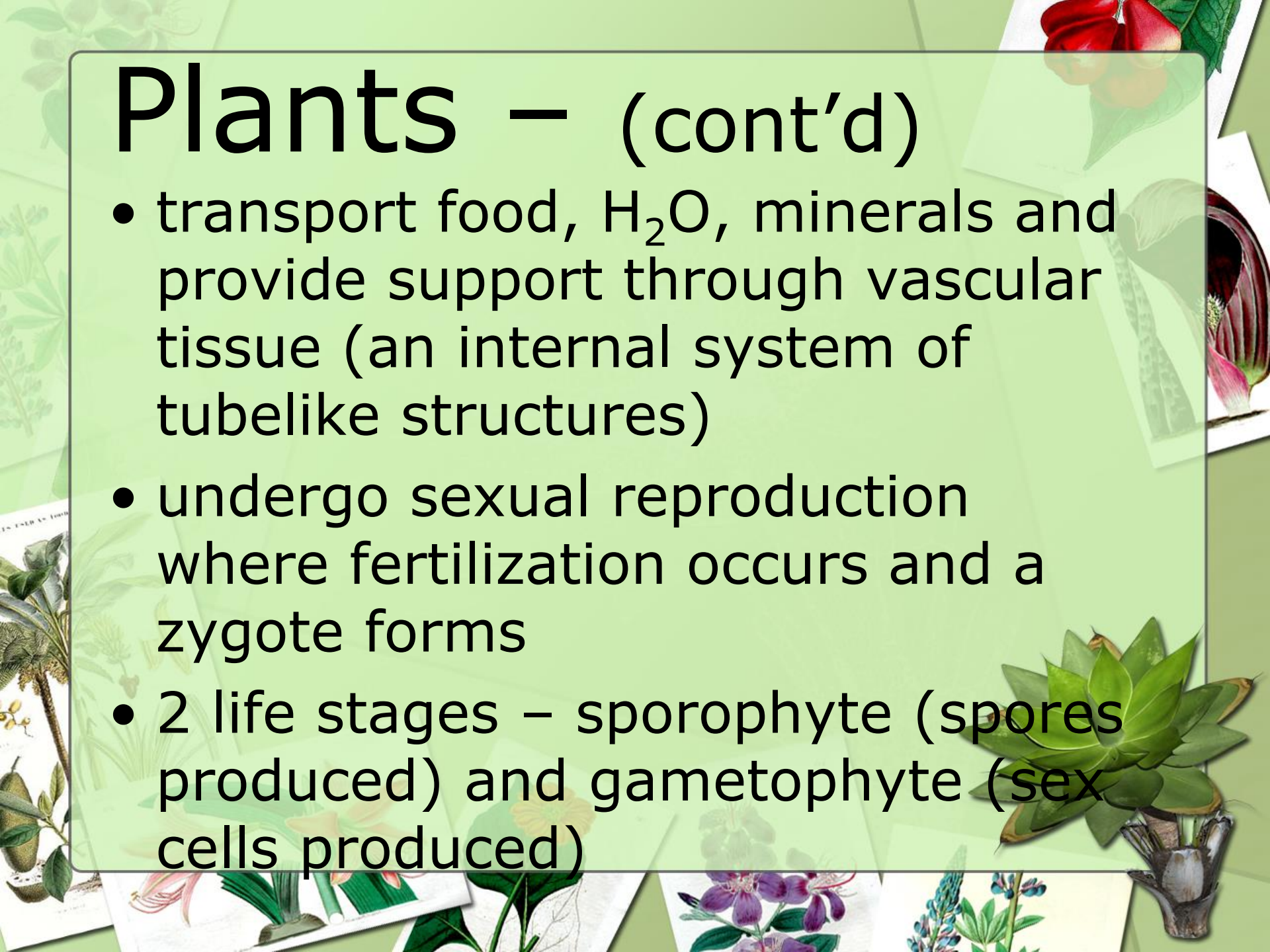
Plants –

- multicellular
- eukaryotic
- autotrophs (undergo photosynthesis to produce food)
- live on land
- obtain H₂O and nutrients from soil through root systems



Plants – (cont'd)

- transport food, H_2O , minerals and provide support through vascular tissue (an internal system of tubelike structures)
- undergo sexual reproduction where fertilization occurs and a zygote forms
- 2 life stages – sporophyte (spores produced) and gametophyte (sex cells produced)



Nonvascular Plants –

- Mosses, liverworts and hornworts are nonvascular plants.

Q: What is a nonvascular plant?

A: a low-growing plant that lacks vascular tissue



Nonvascular Plants –

- multicellular
- eukaryotic
- autotrophic
- NO complex system to transport nutrients, water and food
- low-growing
- MUST live in high moisture environments to survive and reproduce

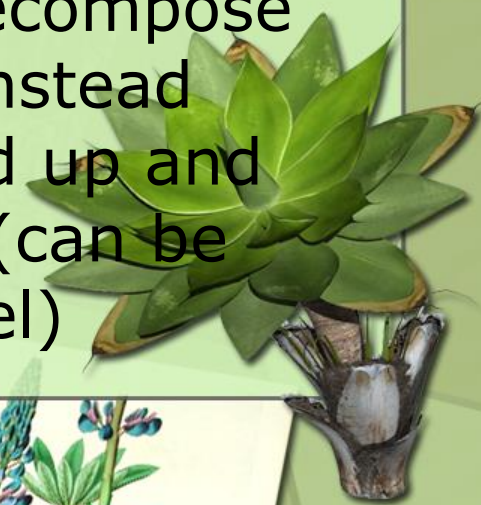


Nonvascular Plants –



mosses

- pioneer plants
- grow in bogs
- have thin roots called rhizoids
- DO NOT decompose when die instead layers build up and form peat (can be used as fuel)



Nonvascular Plants –

liverworts

- grow flat along the ground
- live in moist environments
- body of plant resembles a human liver



Nonvascular Plants –

hornworts

- grow horn-like structures
- live in moist environments



Vascular Plants –

- have vascular tissue
(provides support and transports food and H₂O)
- seedless – use spores to reproduce
- grow in moist surroundings because they produce spores



Vascular Plants – ferns



- have underground stems, leaves, and roots
- roots anchor the fern to the ground and absorb water and nutrients from the soil
- leaves of ferns are called fronds
- fronds are coated with a cuticle that helps the plant retain water
- serve as houseplants, food

Vascular Plants –

club mosses

- have true leaves, stems, and roots
- resembles a small branch of a pine tree
- live in moist woodlands, along streams
- few species alive today



Vascular Plants – horsetails

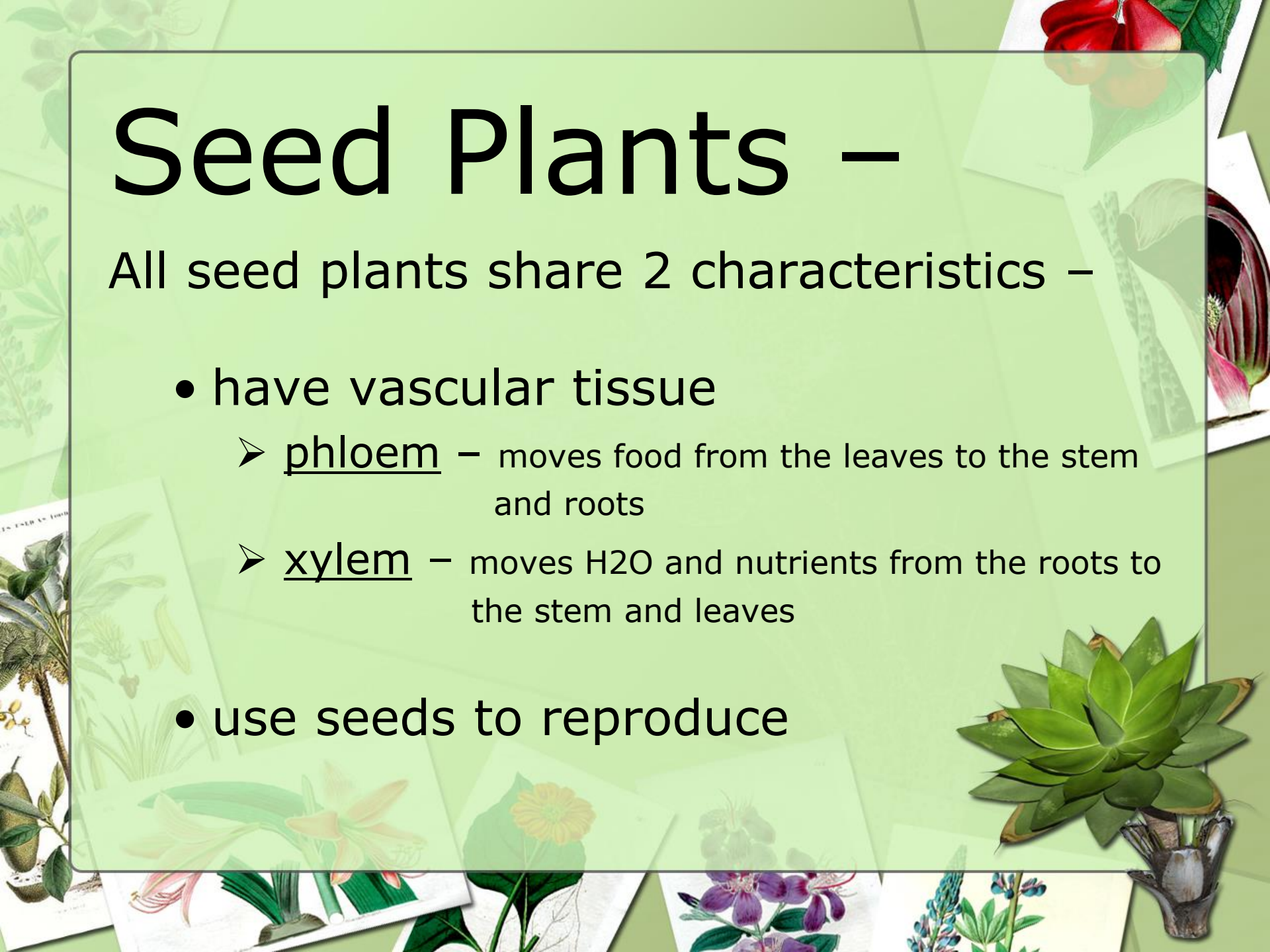


- have true leaves, stems, and roots
- long, coarse, needlelike branches with jointed stems
- contain silica in their stems
- “scouring rushes”
- early Americans; used them to clean pots and pans
- few species alive today

Seed Plants –

All seed plants share 2 characteristics –

- have vascular tissue
 - phloem – moves food from the leaves to the stem and roots
 - xylem – moves H₂O and nutrients from the roots to the stem and leaves
- use seeds to reproduce



Seed Plants – (cont'd)

Q: What is a seed?

A: structures that contain a young plant inside a protective covering

3 parts of a seed –

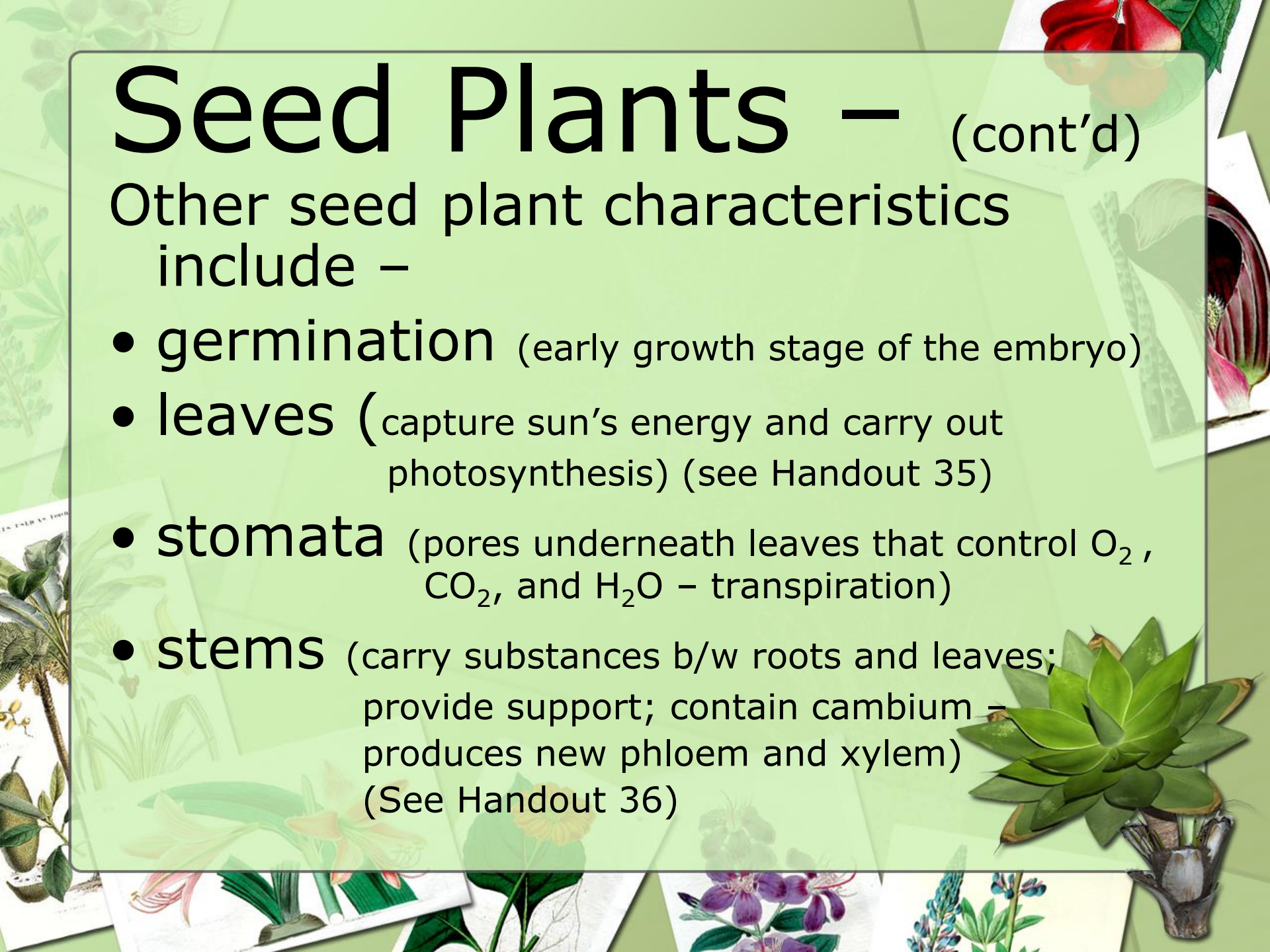
- embryo
- stored food (seed leaves – cotyledons)
- seed coat



Seed Plants – (cont'd)

Other seed plant characteristics include –

- **germination** (early growth stage of the embryo)
- **leaves** (capture sun's energy and carry out photosynthesis) (see Handout 35)
- **stomata** (pores underneath leaves that control O_2 , CO_2 , and H_2O – transpiration)
- **stems** (carry substances b/w roots and leaves; provide support; contain cambium – produces new phloem and xylem) (See Handout 36)

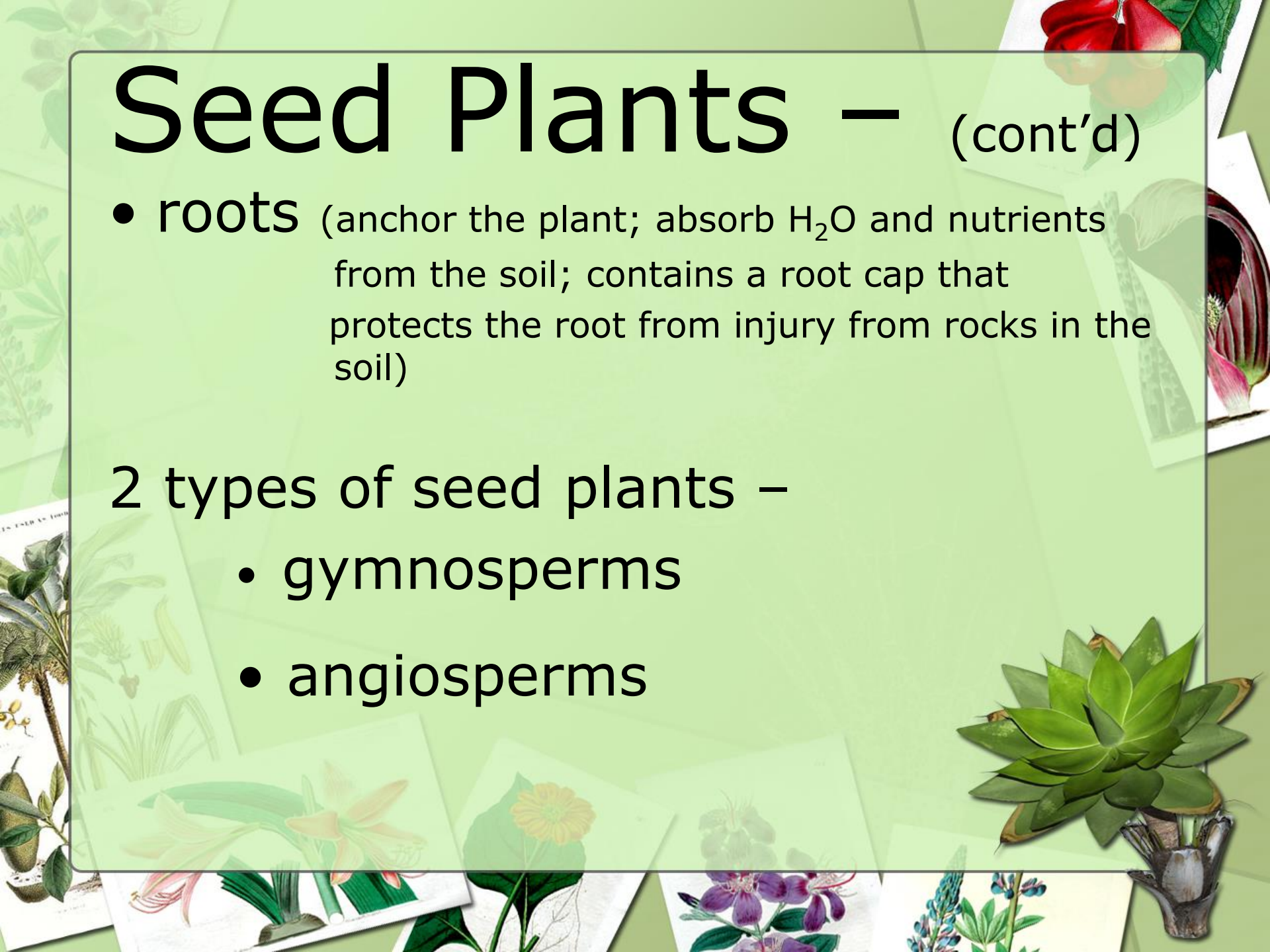


Seed Plants – (cont'd)

- **roots** (anchor the plant; absorb H₂O and nutrients from the soil; contains a root cap that protects the root from injury from rocks in the soil)

2 types of seed plants –

- gymnosperms
- angiosperms



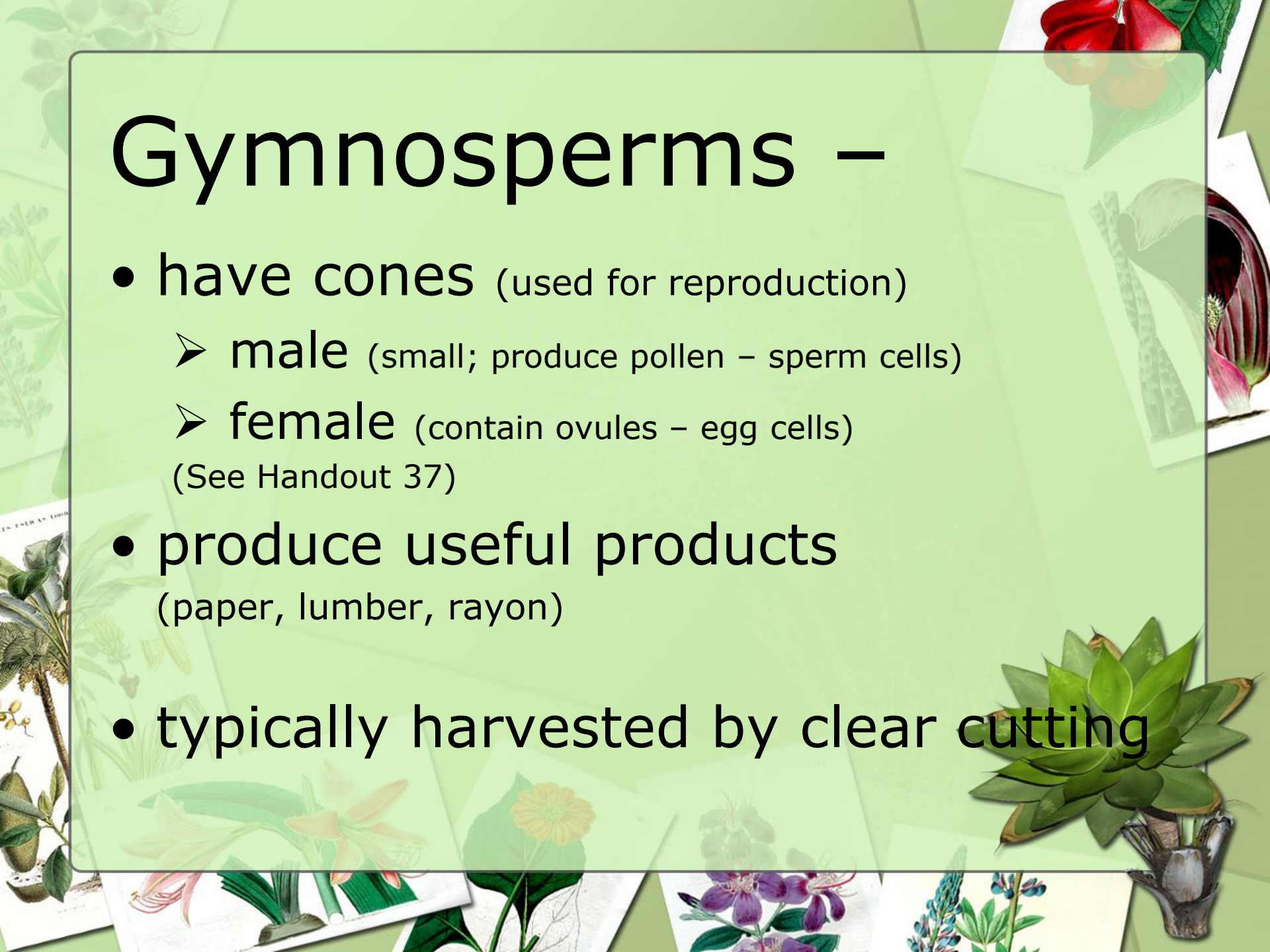
Gymnosperms –

- produce seeds w/ no protective coating
- needlelike or scalelike leaves
- deep-growing root systems
- mainly trees though some shrubs and vines
- 4 groups – cycads, ginkgo, gnetophytes, conifers



Gymnosperms –

- **have cones** (used for reproduction)
 - **male** (small; produce pollen – sperm cells)
 - **female** (contain ovules – egg cells)(See Handout 37)
- **produce useful products**
(paper, lumber, rayon)
- **typically harvested by clear cutting**



Gymnosperms –

cycads



- resemble palm trees w/ cones
- cones can grow as large as a football
- grow in tropical or subtropical areas



Gymnosperms – ginkgo



- 100's of millions of years old
- grow as tall as 25 meters
- *Ginkgo biloba* – for memory retention
- planted in cities b/c tolerate air pollution well
- ripened fruit smells like dog poo



Gymnosperms –



gnetophytes

- live ONLY in hot, dry, deserts of south Africa, the US and in tropical rainforests
- shrubs or vines



Gymnosperms –

conifers

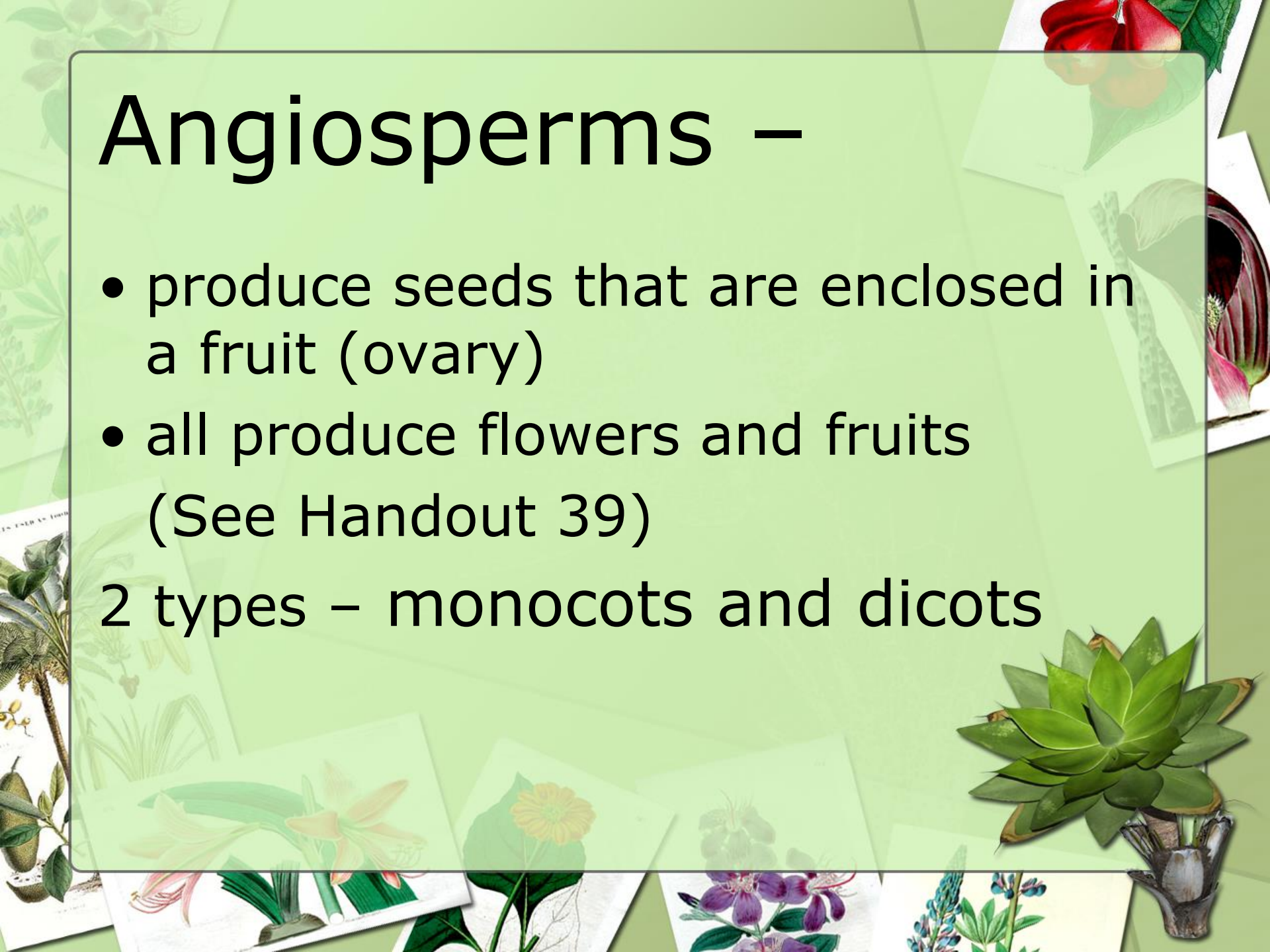


- cone-bearing plants
- largest and most diverse group
- pines, redwoods, cedars, hemlocks, junipers – evergreens
- keep their leaves/needles year-round



Angiosperms –

- produce seeds that are enclosed in a fruit (ovary)
 - all produce flowers and fruits
(See Handout 39)
- 2 types – monocots and dicots



Dicots vs. Monocots



In seeds, two cotyledons (part of the embryo)



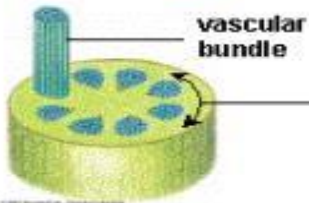
Usually four or five floral parts (or multiples of these)



Usually a netlike array of leaf veins



Basically, three pores or furrows in pollen grain



Vascular bundles arrayed as a ring in stem

DICOTS



In seeds only one cotyledon



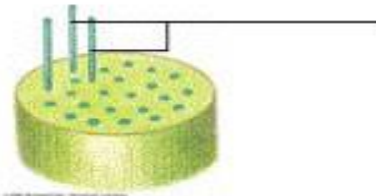
Usually three floral parts (or multiples of three)



Usually a parallel array of leaf veins



Basically, one pore or furrow in pollen grain



Vascular bundles distributed ground tissue of stem

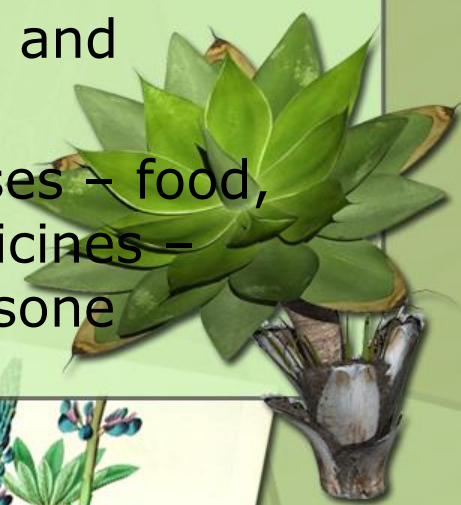
MONOCOTS

Angiosperms –



dicots

- seed parts – 2 cotyledons
- leaf – branching veins
- stem – circle formation of vascular tissue
- flower parts – in 4's or 5's
- roses, violets, and dandelions.
- have many uses – food, clothing, medicines – digitalis, cortisone

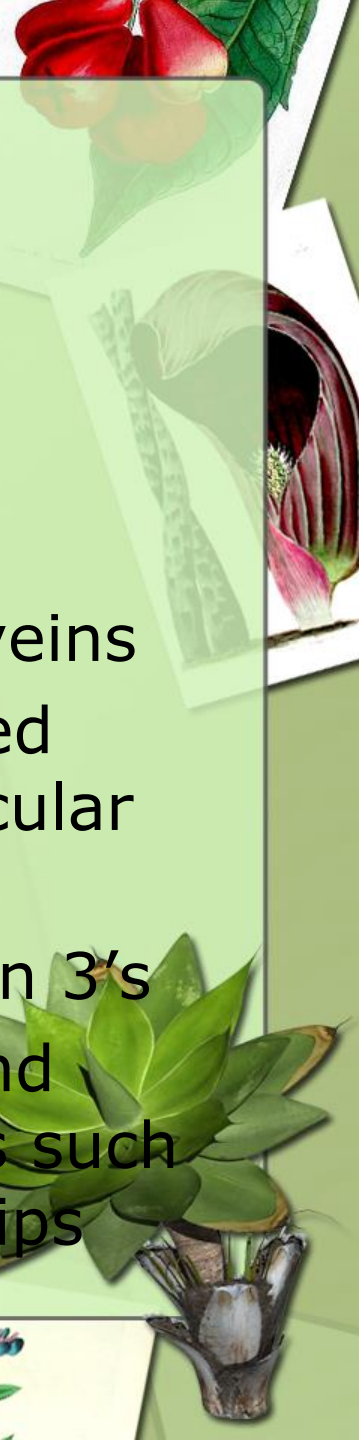


Angiosperms –



monocots

- seed parts – 1 cotyledon
- leaf – parallel veins
- stem – scattered bundles of vascular tissue
- flower parts – in 3's
- corn, wheat, and rice, and plants such as lilies and tulips



Plant Responses –

Q: What is a tropism?

A: a plant's growth response toward or away from a stimulus

3 important stimuli that plants respond to –

- touch
- light
- gravity



Plant Responses –

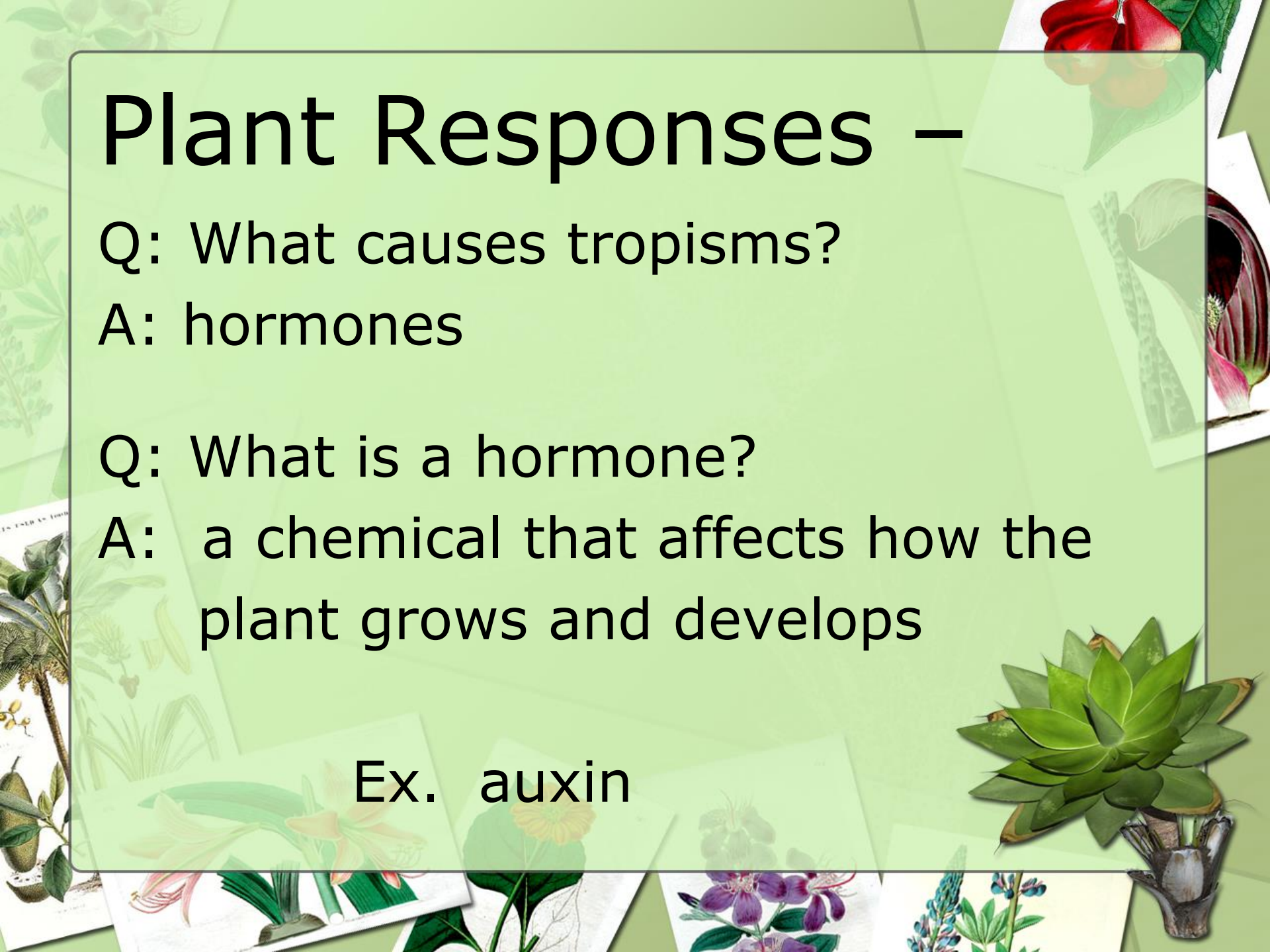
Q: What causes tropisms?

A: hormones

Q: What is a hormone?

A: a chemical that affects how the plant grows and develops

Ex. auxin

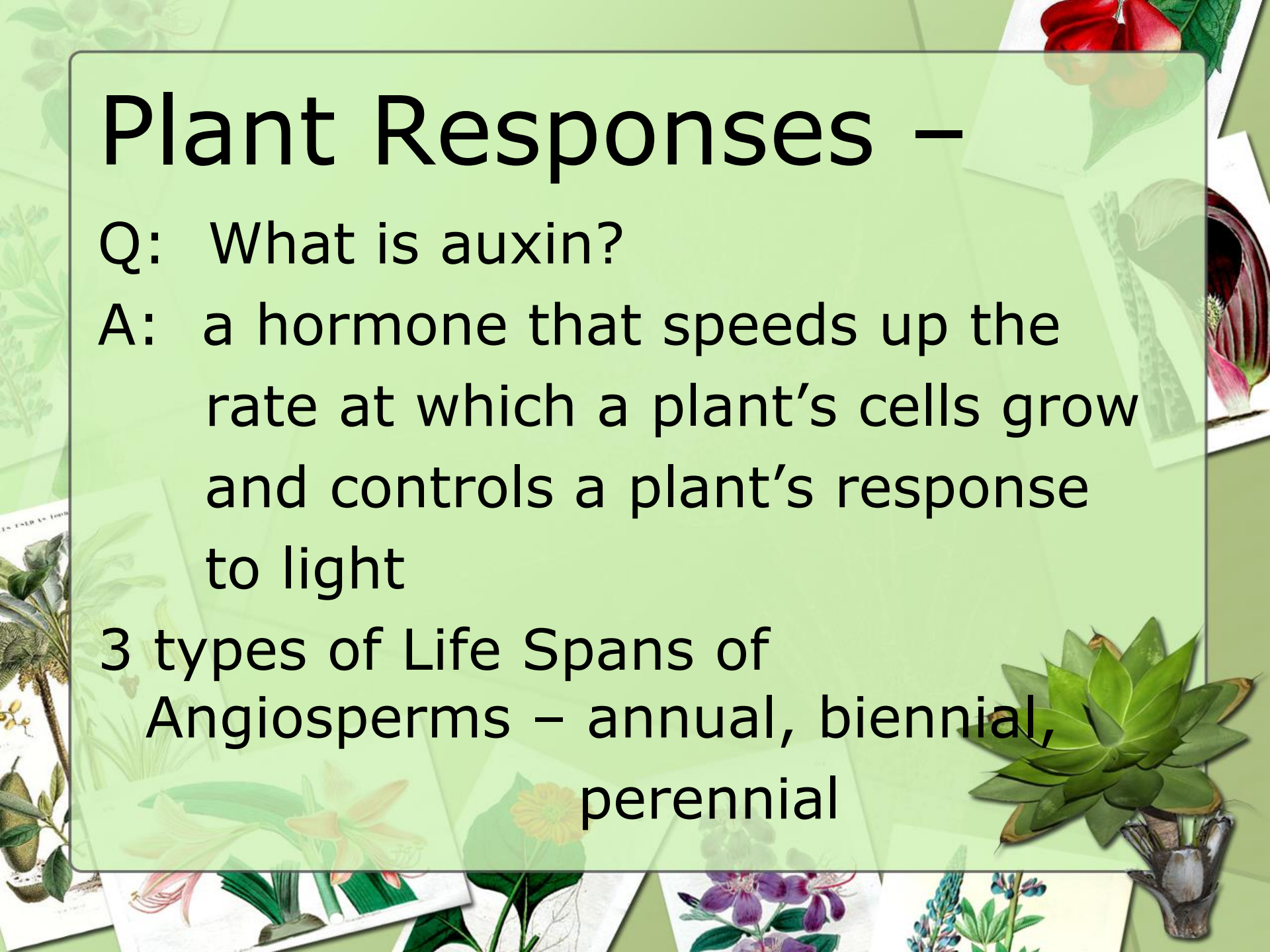


Plant Responses –

Q: What is auxin?

A: a hormone that speeds up the rate at which a plant's cells grow and controls a plant's response to light

3 types of Life Spans of Angiosperms – annual, biennial, perennial

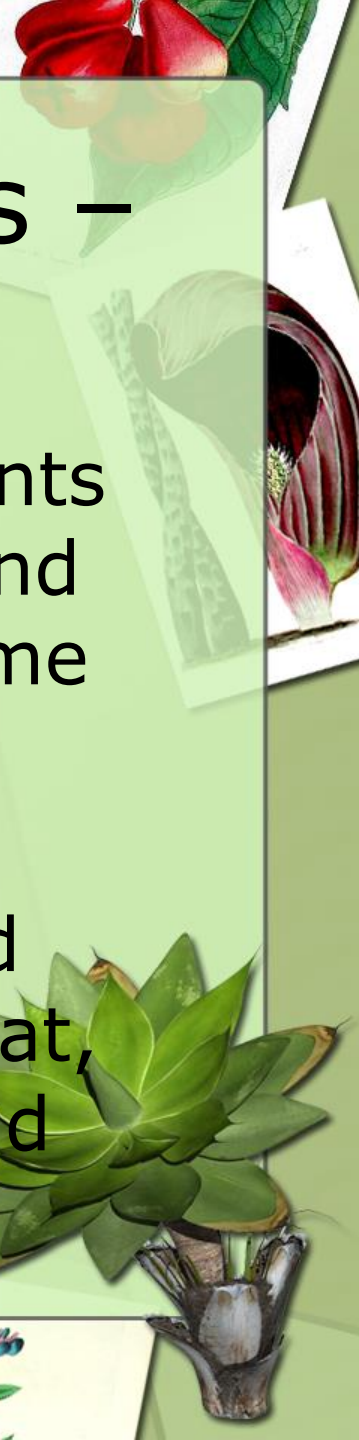


Life Spans of Angiosperms –



Annuals

- flowering plants that flower and die in the same year
- marigolds, petunias, and pansies, wheat, tomatoes, and cucumbers



Life Spans of Angiosperms –



Biennials

- flowering plants that complete their life cycle in two years
- parsley and celery



Life Spans of Angiosperms –



Perennials

- flowering plants that live for more than two years
- oak trees and honeysuckle



Plant Growth –



Tropisms and hormones control germination.

Q: What is germination?

A: the formation of flowers, stems, and leaves, the shedding of leaves, and the development and ripening of fruit

The End

