

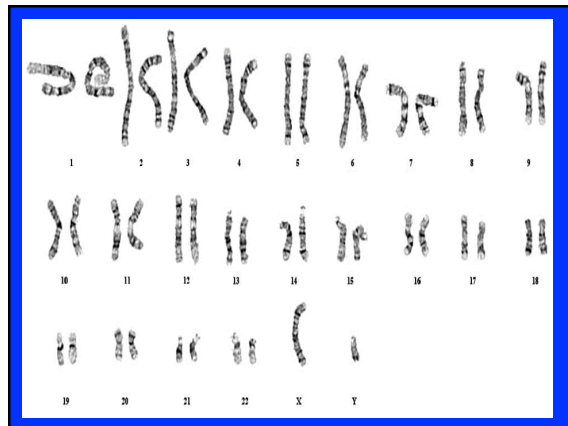
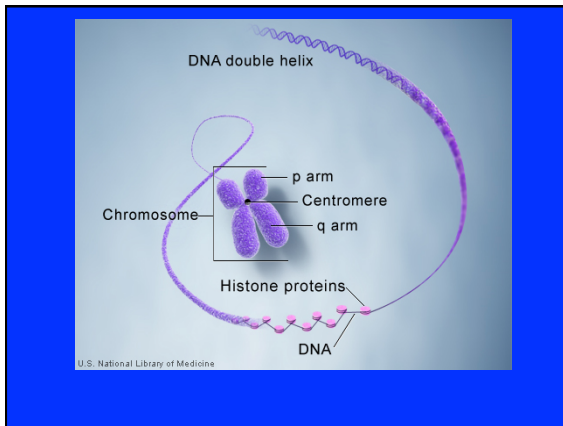
Reproduction

- **Asexual Reproduction**
 - involves only 1 parent
 - offspring **genetically identical** to parent
 - involves regular **body cells**
 - its **quick**
- **Sexual Reproduction**
 - involves 2 parents
 - offspring **genetic mix** of both parents
 - involves specialized **sex cells**
 - its **slow**



Chromosomes

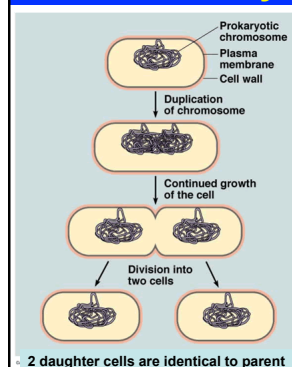
- Carries genetic info from generation to generation.
- A **chromosome** is an organized structure of DNA.
- DNA would stretch up to 6 ft if it wasn't packaged this way.
- Chromosomes make it is to copy genetic material, so reproducing is easier.



Asexual Reproduction


- Binary fission
- Budding
- Spore Formation
- Vegetative Reproduction
- Regeneration

Binary Fission



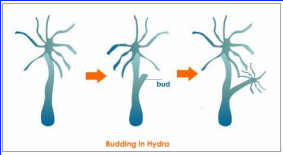
–happens in bacteria, amoeba, some algae
 –one parent cell splits into 2 identical daughter cells

Budding



Insert video

- happens in yeast, hydra, corals
- parent produces a bud
- bud gets detached and develops into offspring which is identical to parent



Budding in Hydra

Spore Formation

- happens in fungi, green algae, molds and non flowering plants (e.g. ferns)
- spores are produced and each spore develops into offspring which are identical to parent




Fungi




Fern

Vegetative Reproduction

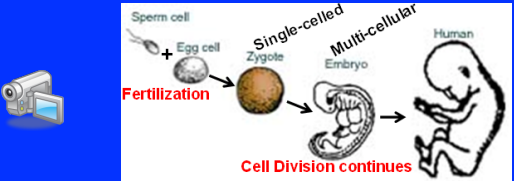
- does not involve seeds
- some offspring can grow from cuttings, runners (e.g. strawberries), tubers (e.g. potatoes) or bulbs (e.g. tulips)... which are part of the parent plant





Sexual Reproduction in Animals


- involves specialized sex cells called **gametes**
- the union of a male and female gamete results in the formation of a **zygote** that develops into a new individual

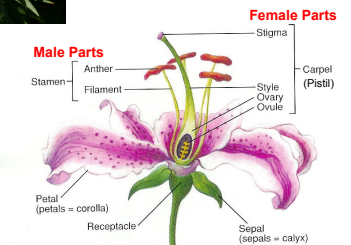


Gamete vs Somatic Cells

- **Somatic** cells are body cells. Humans have 46 chromosomes in each somatic cell.
- **Gametes** are sex cells. Males have sperm cells while females have ovum (egg cell). Gametes carry half the genetic information of an individual. Humans have 23 chromosomes in a gamete.
- Dogs have 21 chromosomes somatic cells, how many chromosomes are in a dog's gametes?

Sexual Reproduction in Plants






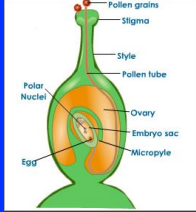
pollen (male) + ovule (female) → single-celled zygote → multi-celled embryo (contained in a seed) → new individual

Sexual Reproduction in Plants

- **stamen** is the male part and contains pollen
- **carpels or pistil** is the female part and contains **ovule** (eggs)
- pollen grains from the **anther** are transferred to the **stigma** by the process of **pollination**
 - self pollination (plant pollinates its own eggs)
 - cross pollination (pollen from one plant pollinates another plants eggs)

Pollination

- flowers are designed to lure insects to help with the pollination process
 - also wind, animals, birds can transport pollen


Sexual Reproduction Summary

	Male Gamete	Female Gamete	Type of Union	Result of Union	Final Result
Plants	pollen	ovule (egg)	pollination	single cell zygote	multi-cell embryo (in seed)
Animals	sperm	egg	fertilization	single cell zygote	multi-cell embryo


Some Organisms do Both

- most plants that produce seeds (sexual reproduction) can also reproduce asexually by things like cuttings or runners
- this gives them an advantage for survival

sponges and hydra



mosses



Which is Better?

It depends!

<u>Asexual Reproduction</u>	<u>Sexual Reproduction</u>
<ul style="list-style-type: none"> • advantages <ul style="list-style-type: none"> – does not require special cells or a lot of energy – can produce offspring quickly – in a stable environment creates large, thriving population • disadvantages <ul style="list-style-type: none"> – limited ability to adapt – face massive die-off if environment changes 	<ul style="list-style-type: none"> • advantages <ul style="list-style-type: none"> – lots of variation within a species – able to live in a variety of environmental settings – able to adapt to changes in the environment • disadvantages <ul style="list-style-type: none"> – needs time & energy – produce small populations

- 1) All of these are an example of asexual reproduction except:
 - A. A sea star regenerating a new arm
 - B. A mother dog giving birth
 - C. A potato sprouting new plants from its buds
 - D. A strawberry plant forming new plants with runners
- 2) Which of the following can perform regeneration?
 - A. Cats
 - B. Gopher
 - C. Star Fish
 - D. Chicken
- 3) How many chromosomes do gametes contain?
 - A. The same as somatic cells
 - B. Double the amount of somatic cells
 - C. 1/3 of the amount of somatic cells
 - D. Half the amount of somatic cells

4) Some organisms can perform both asexual and sexual reproduction.

-True or False?

5) List 3 types of asexual reproduction

6) How is a zygote formed?