Objective and Catalyst

- Students will: (1) model asexual reproduction (2) compare types of asexual and sexual reproduction by completing a graphic organizer in order to understand how organisms reproduce

Catalyst:

- Take out the half-sheet "What do we know about Reproduction"
- You will also need your ISN
- Fill in the "Before" column with True or False for each question.

Agenda

- Catalyst
- Reproduction Anticipation Guide
- Asexual Reproduction Lab
- Reproduction Notes
- Exit Slip

Homework

- DUE Monday, 1/26….
  - Finish the notes/questions from Chapter 10.1
  - Survival of the Sickest Ch.5
  - Signed Gradesheet and Goals

Using your Resources

- Where can you find copies of old assignments?
- Where can you check your current grade?
- If you are absent where can you check for resources?

Using the Class Website

www.mrsreigelbiology.com

Mrs. Reigel's Biology Class

Carver Vo-Tech HS

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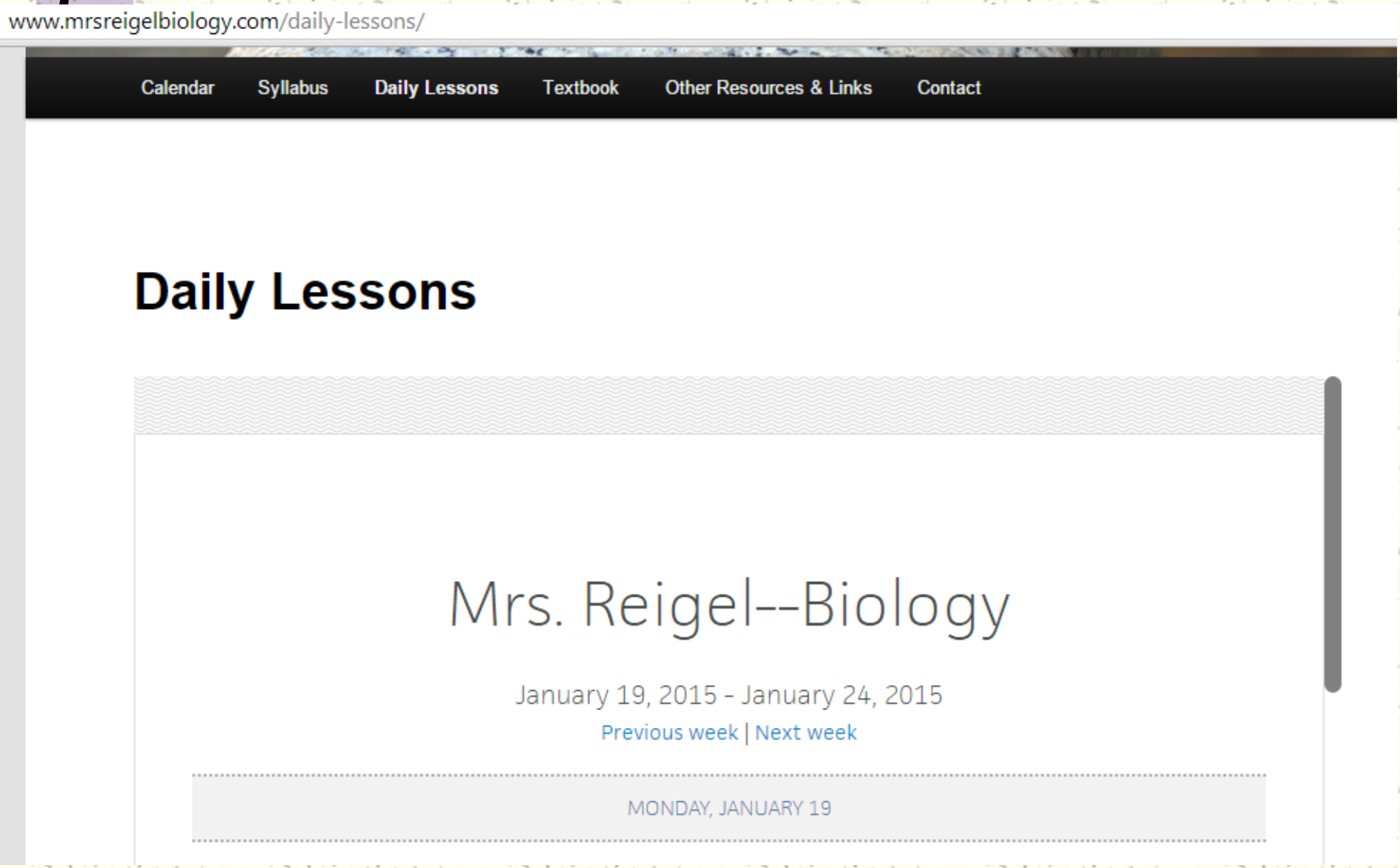
Using the Class Website



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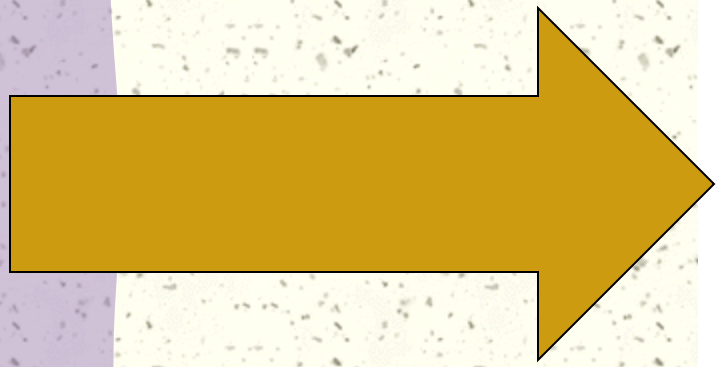


Agenda
15 min–Entry & Catalyst
5 min–Goal Setting Video
20 min–Goal Setting
45–Tissues and Body Systems Notes
5 min–Exit Slip

Homework/Reminders
Midterm/HSA Review Project DUE TODAY
Midterm Exams January 14-17th
2nd Quarter ENDS January 17th

- Biology Midterm_HSA Review Project DUE 1.6.13.pdf

Resources

- 1.6_ Goals_Tissues and Body Systems.pdf
- 1.6_Tissues and Body Systems Handout.pdf
- 1.6_STEPS to Success 2014 Goals.pdf
- One Step at a Time VIDEO
- Cells and Tissues Video

Anticipation Guide

- Answer the following questions with "True" or "False."
- We will fill in the "Before" column before we begin our Reproduction Unit, and the "After" column when we finish to see if our ideas changed after learning!
- Throughout the unit, keep track of your questions and the answers as you find them!

My Questions

- What other questions do you have?

What process?

Characteristics of Life REVIEW!

- Must be made of 1 or more cells ☑
- Must obtain and use energy ☑
- Must maintain homeostasis ☑
- Must Grow Develop and Reproduce
- Must be able to respond to stimuli
  - Adapt

Reproduction

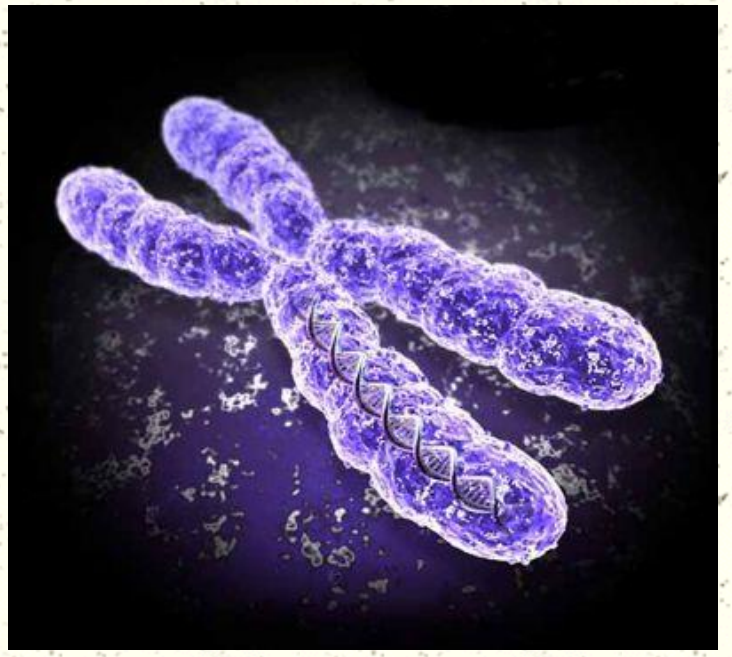
- Process by which offspring (children) are created by parent organisms.
- In plain terms: It is producing more cells
  - Types: Asexual and Sexual
  - Processes: Mitosis and Meiosis (we'll learn this one later)

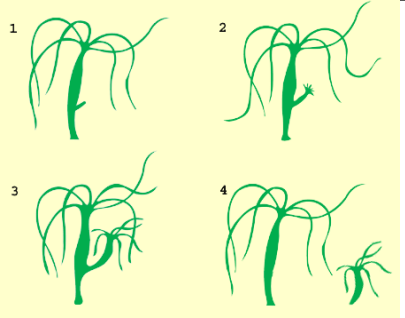
Reproduction

- Passing on genetic material in order to make new organisms
- Genetic Material contains the blueprint for development. It is their DNA
  - In Eukaryotes, like humans and other animals, the DNA is contained in the nucleus of the cell.

Chromosomes

- DNA strands are all coiled and compacted into structures called chromosomes



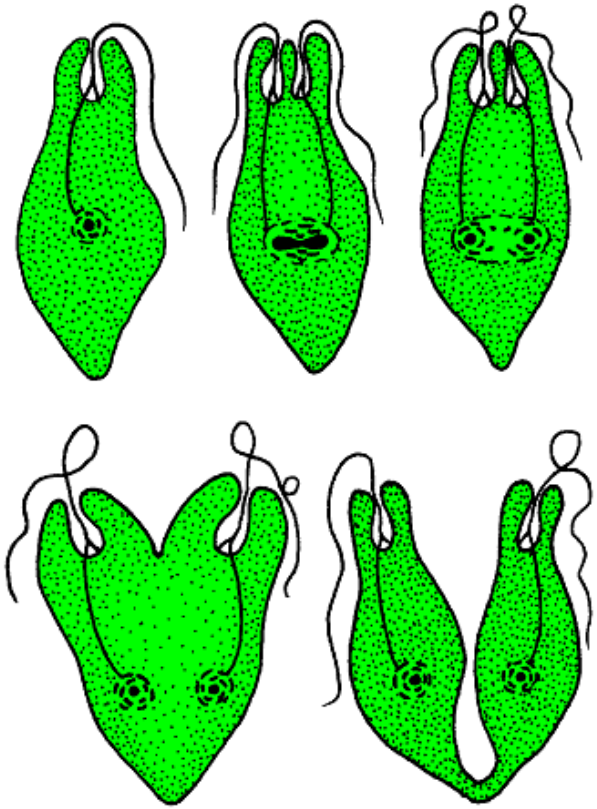


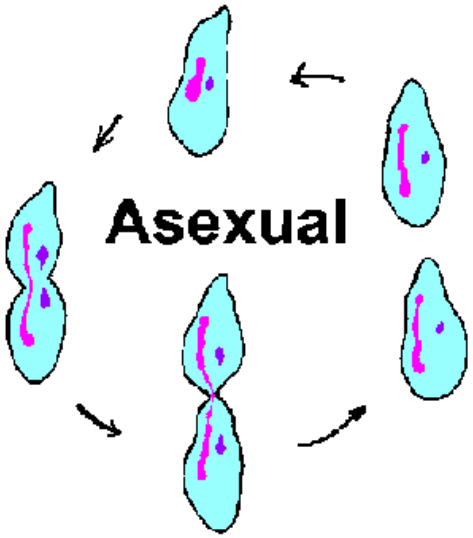
Amoeba

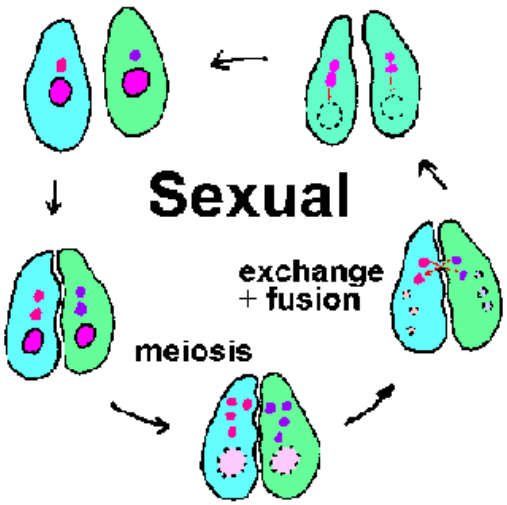
YEAST CELLS

Asexual vs. Sexual Reproduction

FLOWER







Asexual reproduction

- A form of reproduction which does not involve meiosis or fertilization.
- Asexual reproduction = one parent.
- The primary form of reproduction for single-celled organisms such as bacteria.
- Many plants and fungi reproduce mostly asexually as well.

Asexual Reproduction

- Mitosis is the process used by organisms to MAKE MORE IDENTICAL CELLS
  - Cells are Diploid – Di = 2
  - Diploid = 2 of each chromosome or chromosomes are paired
  - Humans have 46 chromosomes or 23 pairs
- Asexual offspring are Clones of their parents
  - What is a clone?
- Clones are organisms with identical genetic material

Model Asexual Reproduction

- Retrieve bags of colored "paramecium" for your group.
- Separate the circles into four colors: **purple, pink, white, and brown**. Each circle represents one *Paramecium* (a unicellular organism). The different colors represent different types of *Paramecia* with different genes.
- Count 3 of each color and place the circles on your desk. The desk will represent the pond the *Paramecia* live in. The twelve circles will be the original population (Generation 0). Record how many of each color you have in the data table below.
- Follow the population of *Paramecia* through five generations by reading the Events. Be sure to record the number of each color after each event.

Model Asexual Reproduction

	Event	# Purple	# Pink	# White	# Brown
0	Original population. Record what you have on your desk when you start.				
1	Each paramecium reproduces once except the white paramecium because a chemical in the pond water kills all of them.				
	A disease strikes, killing all pink *Paramecia*				
2	Each surviving *Paramecium* reproduces once.				
	A predator strikes, killing all brown and $\frac{1}{2}$ purple *Paramecia*				
3	Each paramecium reproduces once.				
	There is not enough food so $\frac{3}{4}$ of the remaining *Paramecia* die.				
4	Each Paramecium reproduces once.				

Draw Conclusions

- 1) What type of *Paramecium* had the best "genes"? _____ How do you know?
- 2) If something happens to kill off a specific type of organism (ex. all red *Paramecia)*, will that type of organism ever appear again? _____ Why or why not?
- 3) Based on your results of this lab, why do you think most multicellular organisms perform sexual reproduction?
- 4) You just learned why asexual reproduction is bad for organisms, but many unicellular organisms like bacteria perform binary fission. Why is this?
- 5) What would happen if humans reproduced asexually? Explain what humans would look like and think about what would happen to society. (Hint: Would all of the jobs we need in society be taken care of? Would humans survive if a deadly bacterium infected people?)

Sexual Reproduction

- Results in increasing genetic diversity of the offspring.

- What do you think genetic diversity is?

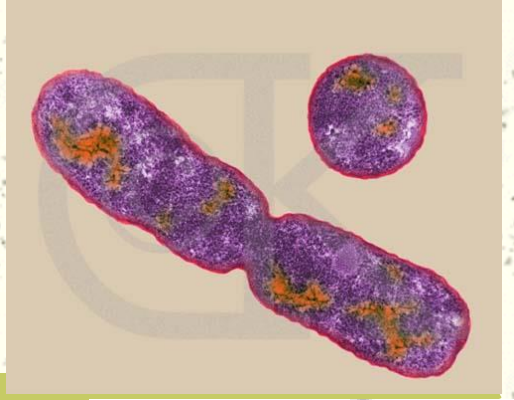
Sexual Reproduction

- Characterized by two processes:
  - meiosis, halving of the number of chromosomes
    - Haploid = 1 set of chromosomes hap = half
    - Sex cells (egg and sperm) each contain 23 chromosomes NOT 46
  - fertilization, combination of two gametes (sex cells sperm, egg) and the restoration of the original number of chromosomes
- Primary method of reproduction for the vast majority of visible organisms, including almost all animals and plants.

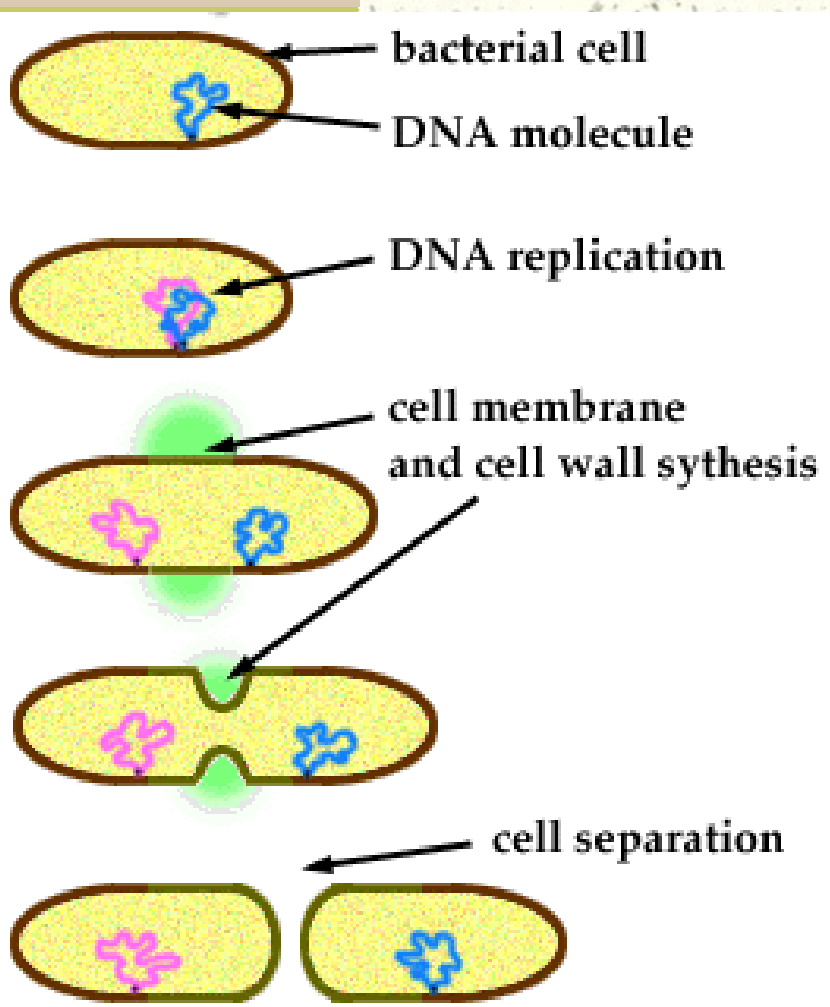
BB: Asexual vs. Sexual Reproduction

Name	Type (asexual or sexual)	What happens ?	Organisms that use this type	+ Positives	- Negatives
1. Binary Fission					
2. Bacterial Conjugation					
3. Fragmentation					
4. Budding					
5. Pollination					
6. Sexual Reproduction					

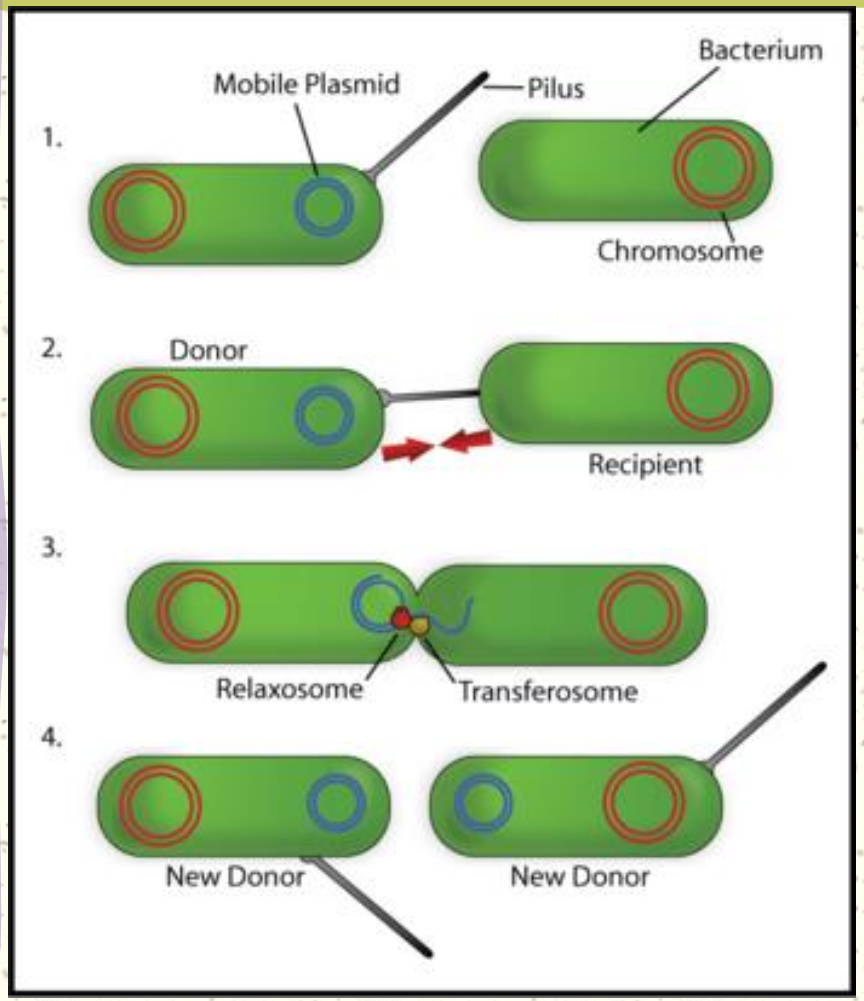
Binary Fission



- Asexual
- Cell splits and replicated DNA goes with each part
- Prokaryotes, Bacteria
- + Fast and easy
- - Everybody has the same DNA



Bacterial Conjugation

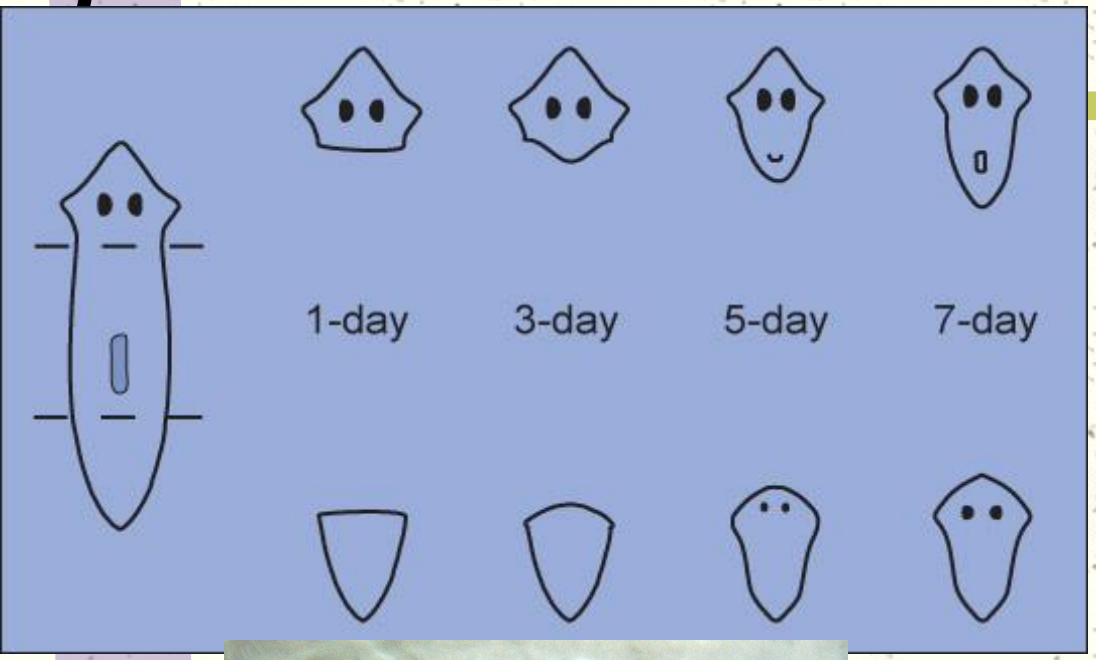


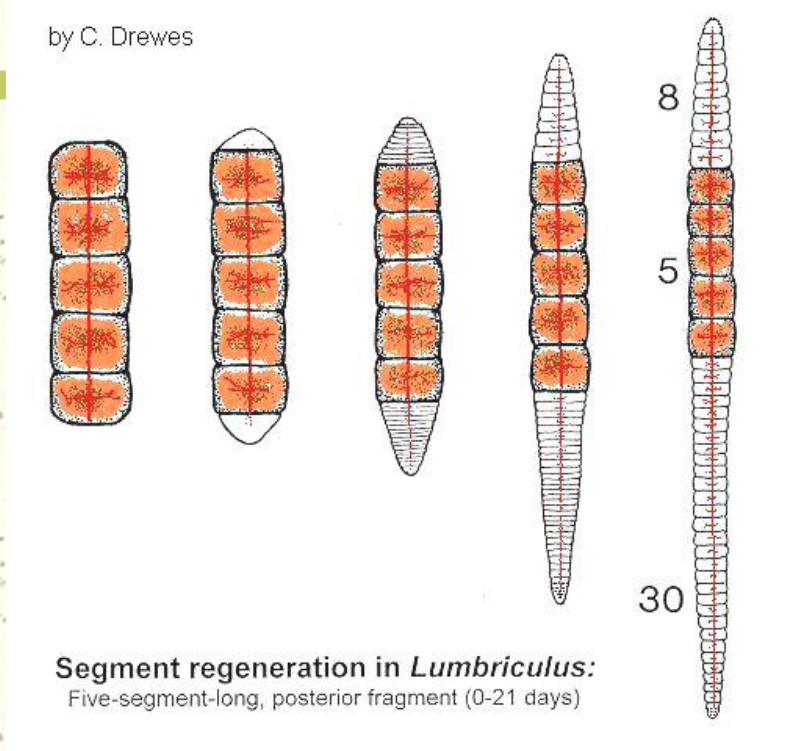
- Asexual, "Sexual"
- A bacteria shoots out a tube and sends a piece of its DNA to another bacteria
- Bacteria
- + Mixes DNA
- - "Parent" loses a little piece of DNA

Fragmentation/ regeneration

- Asexual
- Body of parent breaks and produces offspring
- Fungi, moss, sea stars, planarian
- + Easy
- - Parent broken, same DNA

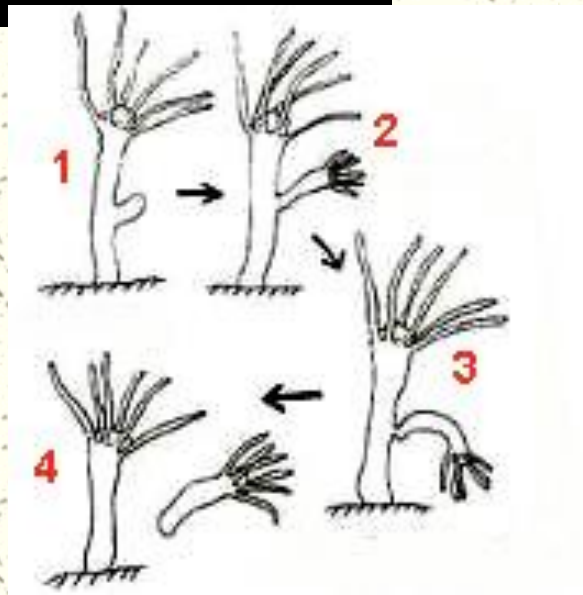
Fragmentation/ regeneration



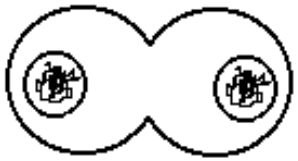


Moss

Budding

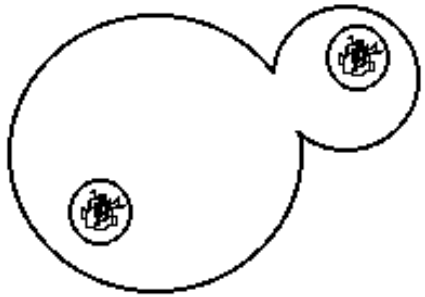


Replicating Yeasts: Fission vs. Budding



yeasts undergoing fission

Schizosaccharomyces spp.



budding yeasts

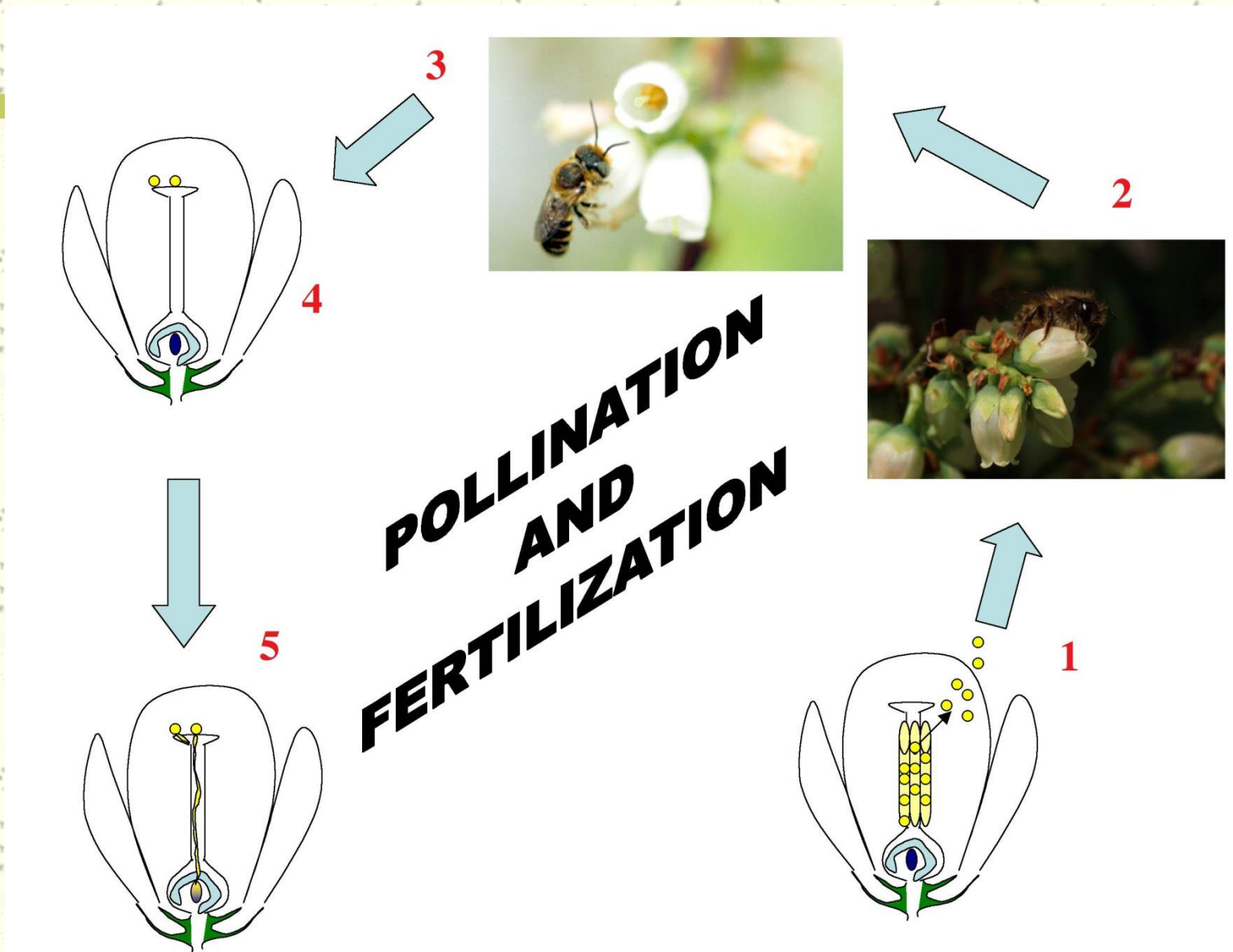
Saccharomyces spp.

- Asexual
- Offspring grows out of parent
- Yeast, hydras
- + Fast, somewhat easy
- - Same DNA

Pollination

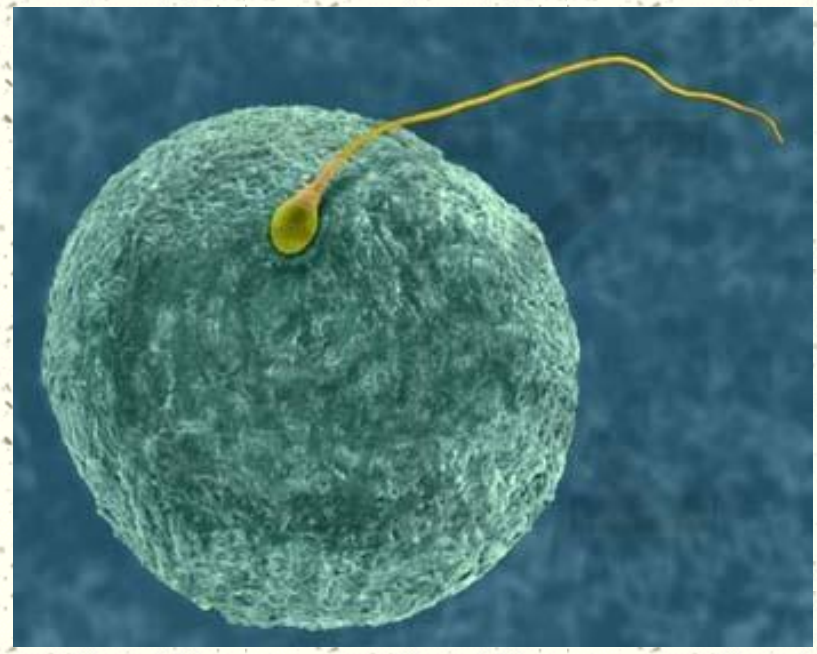
- Sexual
- Pollen is delivered to female part of plant
- Flowering plants
- + Plants don't have to move, mixes DNA
- - Need external source for pollination to take place; wind, bee, bat, butterfly etc.

Pollination



Sexual Reproduction

- Sexual
- DNA from 2 individuals merge to form one
- Animals, Plants
- + Diverse DNA
- - Takes a long time, 2 individuals needed



Objective Check!

- How did we do today?
- Did we:
  - Compare asexual and sexual reproduction?
- Can we explain the differences?

Exit Slip

- Complete the chart based on your new knowledge of sexual and sexual reproduction

	Asexual	Sexual
# of parents		
Process(es)		
Offspring unique or identical?		
Fast or slow		
Examples		