REPRODUCTION

And Meiosis

- Today we will discuss the theme of **stability and change**.
- The process of meiosis is necessary for sexual reproduction and ensures that there is **variation among organisms**.
- Variation within an organism helps the **stability of the species**.
- We will compare and contrast the characteristics of eggs and sperm cells. We will also compare and contrast chromosome numbers in what's called body cells, versus sex cells.

Terms to know:

- **Body cells:**
- These are cells that make up most of your body.
- They reproduce themselves by making exact copies of themselves by **mitosis**.
- (One parent cell forms 2 identical new cells. The instructions tell the cells what to be: blood cells, skin cells etc...
- **All body cells of the human contain 46 chromosomes.**

Lab: Does a relationship exist between chromosome number and the complexity of an organism:) (see appendix G, pg 664)

- The question: Are you more complex than a fruit fly? What about a gold fish? Does complexity of an organism depend on the number of chromosomes in its body cells.
- 1. Next to each organism, indicate the kingdom to which it belongs.
- 2. Which organism listed have the same chromosome number?
- 3. Are the organisms in Question 1 in the same kingdom?
- 4. What can you conclude about a relationship between chromosome number and complexity of an organism.

	Kingdom	Chromosomes in Body Cells	#in eggs	# in sperm
Grasshopper				
giant sequoia				
fruit fly				
tomato				
guinea pig				
goldfish				
spider plant				
dog				
human:				

Terms to know:

- **Sex cells:** In order for organisms to produce off spring, they must produce sex cells.
- If you are a **male**, your body produces sex cells called **sperm.**
- If you are a **female**, your body only produces sex cells called **eggs.**
- Offspring can only be produced when these two types of sex cells are united.

Terms to know:

- **Sperm cells are very tiny** and can only be seen under a microscope.
- Where as **eggs** are one of the cells that can be seen with the naked eye, (they are about the **size of a pencil point.**
- Eggs contain a food supply in the form of a yolk.
- Sperm cells do not.

Meiosis Makes sex cells:

- Sex cells contain **1/2 the number of chromosomes** found in body cells.
- Sex cells are not formed by mitosis, but by a process called **meiosis**.
- The number produced vary greatly.
- Where as a bull can produce as many as 5 billion sperm at once, most cows only produce 1 egg at a time (This is very similar to humans)

Meiosis Makes sex cells:

- Cells produced my meiosis contain 1/2 the number of chromosomes found in the original cell because sperm and eggs are produced by meiosis. They have 1/2 as many chromosomes as body cells from the same organism
- in males: **sex cells are (sperm)** and are produced in **testes**
- in females: **sex cells are (eggs)** and are produced in **ovaries**

Sexual Maturity

- males: meiosis begins when sexual maturity begins: between 10-14
- females: meiosis begins before birth. Chromosomes duplicate themselves, but remain in this stage until female sexual maturity at age 10-14
- **for males:** sex cells will be produced the **rest of their lives**. They do decrease in number with age.
- **for females:** ovaries produce eggs **until 45-55.**

Sexual Maturity

- Sexual maturity differs between organisms
- human: 10-14 years
- mouse: 2 months
- corn plant: 3-4 months
- dandelion: 4-5 weeks

Why is meiosis needed??

- did you ever wonder why you resemble some of your family members more than other people??
- You probably share physical traits with each of your parents because you inherited genetic material from each of them.
- 1/2 of the 46 chromosomes resemble
- **1/2 of your mom's** chromosomes and
- **1/2 resemble 1/2** of your father's.

REMEMBER:

- Meiosis produces sex cells with 1/2 the total number.
- Together the cell that they produce, once again equals 46 chromosomes.

Results

	Kingdom	Chromosomes in Body Cells	#in eggs	# in sperm
Grasshopper	Animal	24	12	12
giant sequoia	Plant	22	11	11
fruit fly	Animal	8	4	4
tomato	Plant	24	12	12
guinea pig	Animal	64	32	32
goldfish	Animal	94	47	47
spider plant	Plant	24	12	12
dog	Animal	78	39	39
human:	Animal	46	23	23

Results

- 1: Next to each organism, indicate the kingdom to which it belongs.
- 2. Which organism listed have the same chromosome number?
- (grasshopper, tomato, spider plant)
- 3. Are the organisms in Question 1 in the same kingdom?
- (The grasshopper is in a different kingdom from the other two)
- 4. What can you conclude about a relationship between chromosome number and complexity of an organism.

Results

- (The number of chromosomes is not related to its apparent complexity.)
- **Grasshopper: 24** (Animal Kingdom:),
- **giant sequoia: 22** (Plant Kingdom:),
- **fruit fly: 8** (Animal Kingdom:),
- **tomato-24** (Plant Kingdom:) ,
- **guinea pig-64** (Animal Kingdom:),
- **goldfish-94** (Animal Kingdom:),
- **spider plant-24**, (Plant Kingdom)
- **dog-78** (Animal Kingdom:),
- **human-46** (Animal Kingdom:)