

Genetics Unit -Warm Up

- 1.) Where is your DNA found? In the nucleus of your cells
- 2.) Who do you get your DNA from? You get half from Mom and half from Dad
- 3.) How do you think the cells in your body reproduce? Most of your body cells reproduce by splitting in half --but some undergo a process called mitosis, while others use meiosis

Genetics Think-Pair-Share



What Does the Father Look Like?

Observe the colors of the kittens in the photo. Record the kitten's coat colors and pattern. Include as many details as you can.

Observe the mother cat in the photo. Record her coat color and pattern.

Think It Over

Based on your observations, describe what you think the kitten's father might look like. Identify the evidence on which you based your inference.

If the parents have another kitten, will it be identical to the kitten in the picture? Why or why not?

DNA and Genetics



DNA -Notes (Deoxyribonucleic Acid)



A HISTORY OF DNA

Discovery of the DNA double helix

*Rosalind Franklin - X-ray photo of DNA.
(1952)

* Watson and Crick - described the DNA molecule from Franklin's X-ray.
(1953)



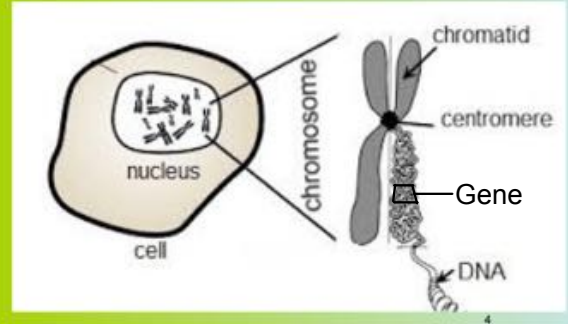
Genetic material of cells...

- **GENES** – small sections of your DNA that **CODES FOR A SPECIFIC TRAIT.**
- **CHROMOSOME** is a **strand of DNA.**
– Humans have 46 chromosomes: 23 pairs-1 from mom, one from dad.
- All 46 chromosomes (23 pairs) are called your **Genome.**

Warm Up

1. Is changing the DNA of a living thing ever okay? Why or why not?

Please Draw this Picture in your Notes:

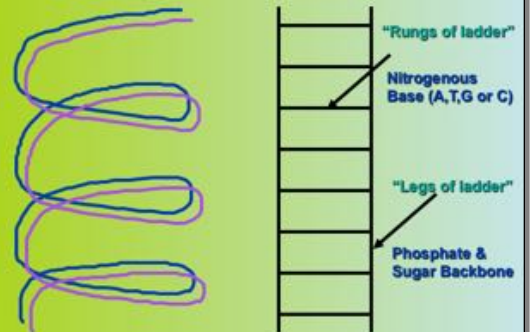


Watson & Crick proposed...

•DNA had specific pairing between the nitrogen bases:



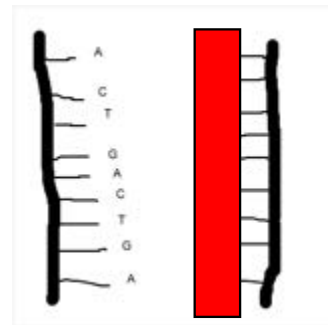
DNA Double Helix



DNA Video: Stated Clearly



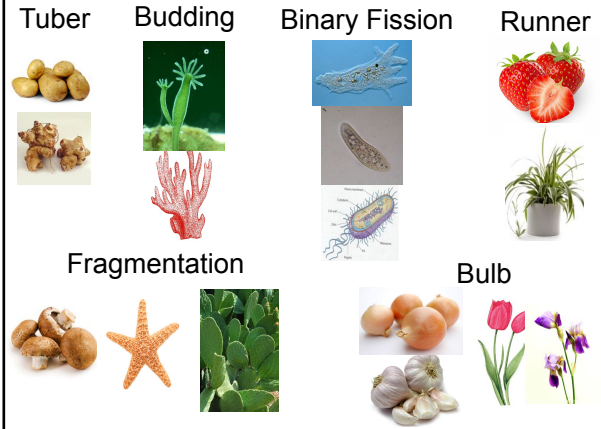
Draw and write the letters of the LEFT half of the DNA. Then, complete the Right side of the DNA:



Warm Up

- 1.) What are the four nitrogen base pairs that make up DNA?
 - adinine, cytosine, guanine, thymine
 - adinine --> thymine
 - cytosine --> guanine
- 2.) Which bases pair together?
- 3.) What is the shape of DNA?
 - double helix

Check Your Work



Warm Up

1. How do bacteria reproduce?
 - binary fission- grow big and split in half.
2. How do flowering plants reproduce?
 - After pollination occurs, fertilization happens and the ovules grow into seeds within a fruit.
3. What are some similarities and differences between these 2 types of reproduction?

Asexual and Sexual Reproduction Vocab

| | |
|----------------------|--|
| Alleles | The different forms of a gene. |
| Asexual reproduction | A form of reproduction in which a new organism is created from a single parent and inherits the genes of that parent only. |
| Binary Fission | Binary fission is the subdivision of a cell into two or more parts and the regeneration of those parts into two separate cells. |
| Budding | A form of asexual reproduction in which a new organism grows on another one. The new organism remains attached as it grows, separating from the parent organism only when it is mature. The newly created organism is a clone and is genetically identical to the parent organism. |
| Egg Cell | The "female" sex cell; contains 1/2the genetic information of the female parent. |
| Fertilization | The process in which the sex cells of different organisms of the same species combine to produce a new organism. |
| Gamete | A cell that fuses with another cell during fertilization (conception) in organisms that reproduce sexually; also known as the sex cells. |
| Gene | A gene is the set of information that controls a trait; a segment of DNA on a chromosome that codes for a specific protein. |
| Sexual reproduction | A form of reproduction in which a new organism is created by combining the genetic material of two organisms of the same or similar genetic species. |
| Sperm Cell | The "male" sex cell; contains 1/2the genetic information of the male parent. |

Warm Up

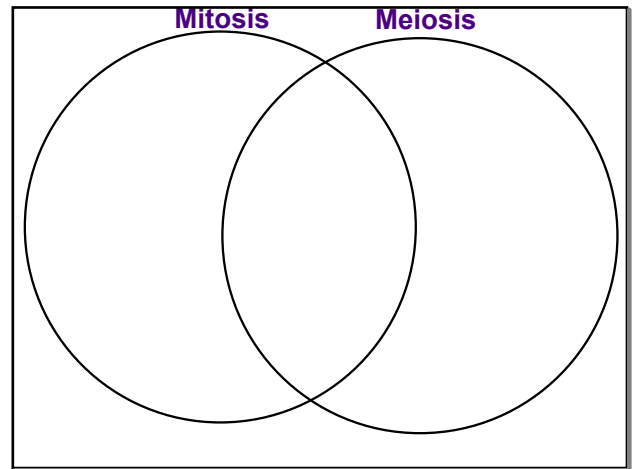
- 1.) What are the male and female gametes?
 - sperm and egg cells
- 2.) What is the difference between sexual and asexual reproduction?
 - sexual repro requires two parent organisms; asexual repro only needs one parent organism
- 3.) Which type of reproduction, sexual or asexual, results in more variation of offspring? Why?
 - sexual repro because the offspring is getting DNA from two different parents

Warm Up

- 1.) Which type of reproduction do most of our body cells undergo in order for us to grow?
 - asexual
- 2.) Which cells in our body undergo a division process that results in half of the genetic makeup of the original cell?
 - the gametes, or sex cells
- 3.) What is a chromosome and where are they found?
 - an organized structure composed of DNA and proteins; found in the nucleus of cells

Warm Up

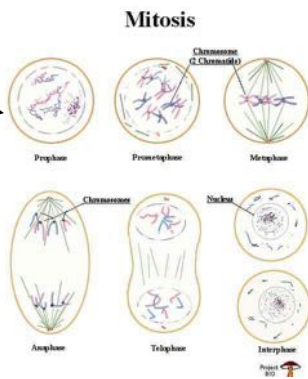
- 1.) How many cells result from 1 cycle of mitosis? 2
- 2.) How many cells result from 1 cycle of meiosis? 4
- 3.) Which process, mitosis or meiosis, creates daughter cells that are genetically unique? meiosis



Mitosis VERSUS Meiosis

Mitosis is the process that creates new body cells. For example: One liver cell divides to create two identical liver cells.

Meiosis is the process your body uses to produce sex cells (sperm and eggs). This process creates special cells that only have half of your DNA.



Mitosis VERSUS Meiosis

| | Mitosis | Meiosis |
|---|---------|---------|
| # of cells produced | 2 | 4 |
| Rounds of cell division | 1 | 2 |
| Haploid or Diploid | Diploid | Haploid |
| Daughter cells identical to parent cells? | Yes | No |
| Daughter cells identical to each other? | Yes | No |

Mitosis

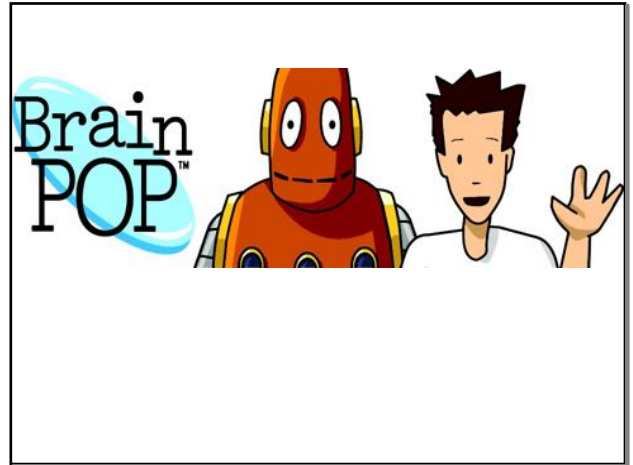


Meiosis



Warm Up

- 1.) What is the biggest difference between mitosis and meiosis?
 - mitosis results in 2 genetically identical cells; meiosis results in 4 genetically unique cells
- 2.) What is the difference between asexual and sexual reproduction?
 - asexual only requires 1 parent; sexual requires 2 parents
 - deoxyribonucleic acid
- 3.) What does DNA stand for?



DNA: The Secret of Life

Follow along with the video and answer the questions as you go. They should be in order. Make sure your name is on the worksheet!



DNA Homework

Put your name on the homework worksheet and work on it in class. Put it into the class tray if you finish before the end of class. Due by tomorrow!

Warm Up -study for your quiz

Let's check the DNA: Secret of Life worksheets

Quiz -write your answers on a separate half-sheet of paper. Cover your work and turn over your sheet when finished.

Work on the Genetics Frayer Model Vocab sheet.
Due by Wednesday!