

Name: _____

Date: _____

Asexual Reproduction by Mitosis

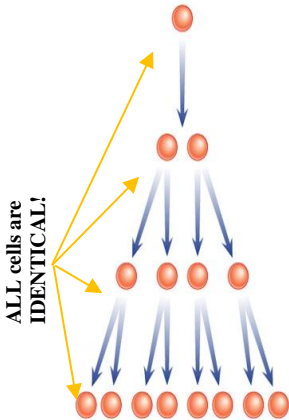
By M. Napier

Objective: Explain the difference between asexual and sexual reproduction.

Organisms reproduce to form new offspring. This is done in one of two ways, asexually and sexually. During **asexual reproduction**, one cell makes two identical cells. **Mitosis** is a process of asexual reproduction. In mitosis one cell divides into two identical cells.

Mitosis is how body cells make new cells to grow or to replace lost cells. It is also how some unicellular organisms reproduce. When prokaryotic bacteria reproduce, they simply divide in half, making

Original "parent" cell



two new identical bacteria cells. When eukaryotic

amoeba reproduce, they can divide in half making two identical amoeba

cells. In both cases, the new organism looks just like the original organism.

There is no change in DNA and therefore no way the organism can **evolve**

or change to better survive in its environment.

Power Words:

asexual reproduction – one cell divides into two cells

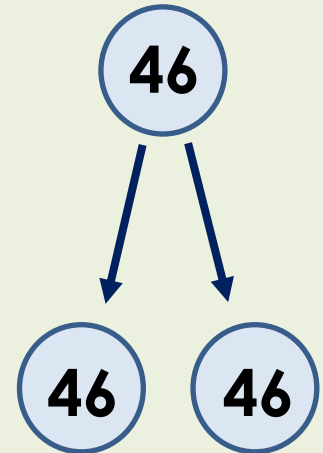
mitosis – asexual reproduction making identical cells

evolve – change over time through many generations

QUESTIONS:

1. What is another name for asexual reproduction? _____
2. How many cells are made from asexual reproduction? _____
3. How do the new organisms (cells) compare to the original organism (cell) in asexual reproduction (mitosis)? _____

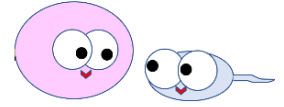
Mitosis



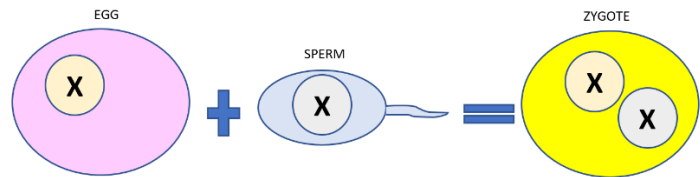
Mitosis in human cell
with 46 chromosomes

Sexual Reproduction

By M. Napier



During **sexual reproduction**, also called meiosis, two **gametes** (sex cells) called an egg and a sperm are made. A sperm and egg combine to form a cell that will become an offspring. So, two cells make one new cell. Sex cells are formed in reproductive organs of the male (**testes**) and female (**ovary**). The testes produce **sperm**. The ovaries produce **eggs**. The joining of a sperm and an egg makes a single cell called a **zygote** which grows into the offspring.



Power Words:

sexual reproduction – two cells combine to make one cell

gamete – a reproductive cell that can make an offspring by combining with another reproductive cell

testes – male reproductive organ

ovary – female reproductive organ

sperm – male gamete

egg – female gamete

zygote – a fertilized egg cell after the sperm enters it, will grow into offspring

QUESTIONS:

4. What is another name for sexual reproduction? _____
5. What two cells join to make one cell in sexual reproduction? _____
6. In sexual reproduction, two cells unite to make _____ (#) zygote cell.
7. What is the male gamete made during sexual reproduction? _____
8. What is the female gamete made during sexual reproduction? _____
9. How do offspring compare to parents in sexual reproduction? _____

Sexual Reproduction by Meiosis - 1

By M. Napier

Objective:

Explain what two types of cells are in your body and how they compare.

Your body is made of body cells called **somatic cells**. Somatic cells form all your body parts and contain a full count of chromosomes (half are from your mom and half are from your dad). A human body cell has 46 chromosomes (23 from mom and 23 from dad). This means that a body cell has 23 *pairs* of chromosomes. Cells that have pairs of similar chromosomes are called **diploid** (2n) cells. The diploid number for humans is 46.

Your body also has sex cells called **gametes**. These are eggs in females and sperm in males. A gamete has half the number of chromosomes found in a body (somatic) cell. A human sperm has 23 chromosomes and a human egg has 23 chromosomes. A cell that has half the number of chromosomes is called a **haploid** (n) cell. This way when the egg and sperm unite to form a zygote, the offspring's cells will have the correct number of chromosomes in each cell (the diploid number).

haploid + haploid = diploid
egg + sperm = zygote
n + n = 2n

Power Words:

somatic cell – the cells that make up the body of an organism

diploid – the full number of chromosomes in somatic cells of an organism

haploid – half the number of chromosomes in somatic cells of an organism

QUESTIONS:

1. What are somatic cells? _____
2. What are gamete cells? _____
3. Where do your chromosomes come from? _____
4. How many chromosomes are in a human gamete cell? _____
5. How many chromosomes are in a human somatic cell? _____
6. Gamete (23) + Gamete (23) = Zygote (____)

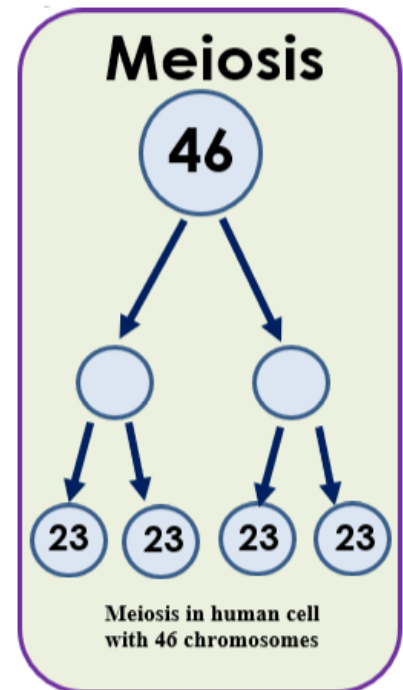
Sexual Reproduction by Meiosis - 2

By M. Napier

Objective:

How does crossing over in meiosis affect genetic makeup of gametes and therefore offspring?

A process called **meiosis** produces gametes, sex cells. During meiosis, two divisions of the original cell occur. These divisions result in creating cells with half the number of chromosomes as the parent cell. The egg and sperm need to have half (haploid) the number of chromosomes so when they combine with each other the zygote (a fertilized egg cell) will have the full number of chromosomes. A zygote develops into the offspring organism. During meiosis, a process called **crossing over** occurs which leads to **genetic variation**. Crossing over results in the new cells (the gametes) having different DNA combinations from each other. This way the new offspring look different from each other. This genetic variation allows for the best genes and traits to be passed on and improves survival of the offspring with those traits.



Power Words:

meiosis – sexual reproduction making non-identical gamete cells

crossing over – pairs of chromosomes exchanging genes to increase genetic differences

genetic variation – the difference in the genes of organisms of the same species

QUESTIONS:

7. Which process produces gametes for sexual reproduction? _____

8. What happens during crossing over? _____

9. What does crossing-over result in at the end of meiosis? _____

10. Why is genetic variation an advantage in reproduction? _____

Name: _____

Date: _____

Reproduction Vocabulary

Match the terms on the left with the correct definition on the right.

- | | |
|-------------------------------|---|
| _____ 1. haploid | A. asexual reproduction making identical cells |
| _____ 2. diploid | B. half the number of chromosomes in somatic cells of an organism |
| _____ 3. sexual reproduction | C. the full number of chromosomes in somatic cells of an organism |
| _____ 4. somatic cell | D. change over time through many generations |
| _____ 5. meiosis | E. the cells that make up the body of an organism |
| _____ 6. evolve | F. two cells combine to make one cell |
| _____ 7. asexual reproduction | G. one cell divides into two cells |
| _____ 8. mitosis | H. sexual reproduction making non-identical gamete cells |

Match the terms on the left with the correct definition on the right.

- | | |
|-----------------------------|---|
| _____ 9. crossing over | A. female gamete |
| _____ 10. genetic variation | B. female reproductive organ |
| _____ 11. gamete | C. a fertilized egg cell after the sperm enters it, will grow into offspring |
| _____ 12. testes | D. pairs of chromosomes exchanging genes to increase genetic differences |
| _____ 13. ovary | E. male reproductive organ |
| _____ 14. sperm | F. the difference in the genes of organisms of the same species |
| _____ 15. egg | G. a reproductive cell that can make an offspring by combining with another reproductive cell |
| _____ 16. zygote | H. male gamete |