Curriculum Outcomes

304-11 illustrate and describe the basic process of cell division, including what happens to the cell membrane and the contents of the nucleus

- illustrate and describe the basic processes of mitosis and meiosis

305-5 discuss factors that may lead to changes in cell's genetic information.

- compare factors that may lead to changes in a cell's genetic information:
  - mutations caused by nature
    - mutations caused by human activities (305-5)

Student Friendly:

- How are the sperm and eggs made
- What happens if a sperm or an egg gets too much, or too little material.

Chromosomes in Babies

→ 23 chromosomes from mother
→ 23 chromosomes from father

Father determines the sex of an offspring

Female Baby → will have X X pair of chromosomes
(X came from mom, X came from Dad)
22 other pairs (44 other chromosomes)

Male Baby → will have X Y
(Dad gave 'Y')
→ 22 other pairs
↳ 44 total chromosomes not related to your sex

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Questions 4-8

4)

	Mitosis	Meiosis
cell division	1	2
#Daughter cells	2	4
#chromosomes	diploid full identical to mother somatic	haploid → half amount of chromosomes as parent Reproduction

1) How do somatic cells are reproductive cells differ from each other? How are they similar?

Somatic cells have a full complement of chromosomes(46 humans) vs. reproductive cells have half complement of chromosomes(23).
Similar - have some chromosomes incommon.

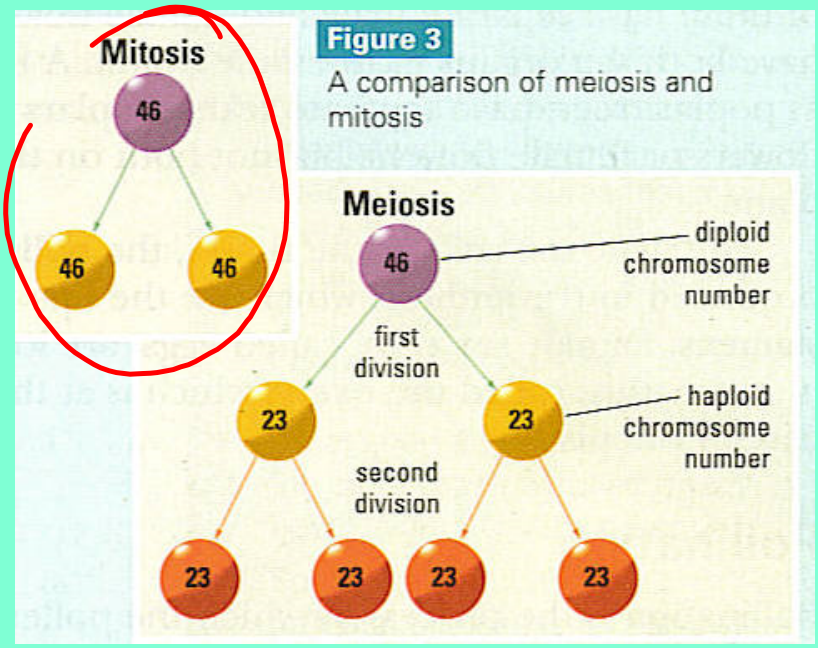
2) What are homologous chromosomes?

Homologous chromosomes - chromosomes that are similar in size, shape, and gene arrangements. Each one of the 23 chromosomes that you receive from your dad matches one from your mom.

3) Describe the two divisions of meiosis.

During the first division, called meiosis I, the homologous chromosomes move to opposite poles. It is during this division that diploid cells separate into two haploid cells. Meiosis I is often called reduction division because the chromosomes number is reduced by half. The diploid or 2n chromosome number following the first division. The second phase, called meiosis II, is marked by the division of the double-stranded chromosome.

4) Use Figure 3 to compare meiosis and mitosis.



Mitosis	Meiosis
One division	Two division
Two cells produced	Four cells produced
Cells are identical to parent	Cells contain half the chromosome number of the parent

5) Why is meiosis necessary?

If meiosis didn't occur, the combination of sex cells would produce a zygote with double the chromosomes, next generation would double again and so on...

Human needs 46

if egg and sperm had both 46

46 + 46 = 92

Chromoson baby

6) A dog has 78 chromosomes in each somatic cell. How many chromosomes would you find in each of its sex cells?

Dog cell 78 chromosomes -
sex cell 39 chromosomes

7) Do homologous chromosomes have the same number of genes? Explain why or why not.

Yes, they have the same number of genes. In addition, genes that code for the same characteristics are located in the same position along homologous chromosomes. Each parent contributes one of the homologous chromosomes.

8) Do homologous chromosomes have identical genes? Support your answer.

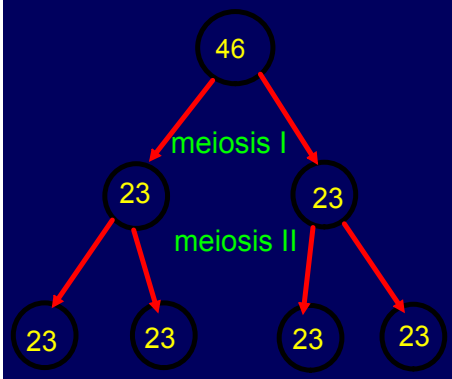
Genes code for the same characteristic but they may not be identical. For example, if the genes on homologous chromosomes of a fruit fly zygote are mapped, you find the gene coding for eye colour is located in the same position on a chromosome contributed by the male and female sex cells. However, the gene itself may be different. The male might contribute a gen for red eye-colour while the female contribute a gene for white eye-colour.

Making a Baby

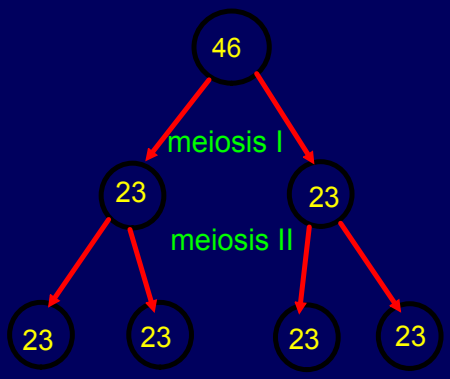
Please copy down

When a reproduction occures correctly:

Male



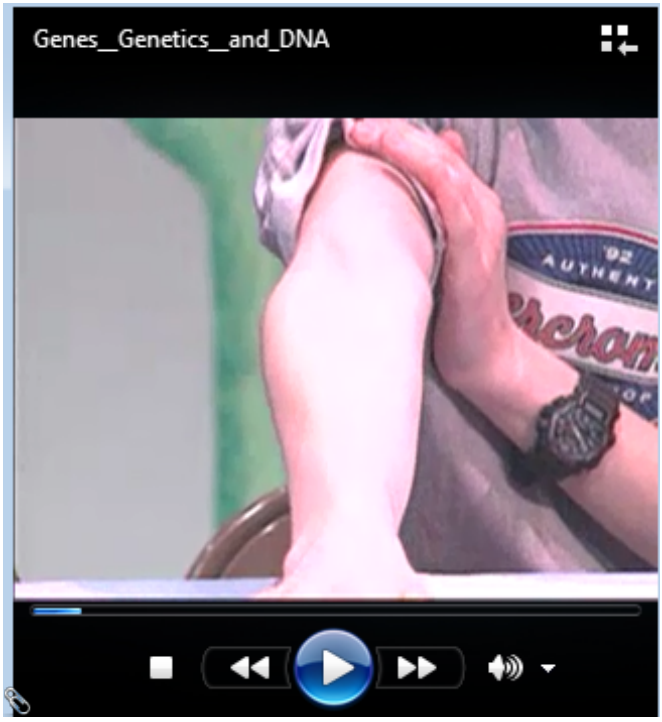
Female



So when parents reproduce only one egg and one sperm is required

Baby

46

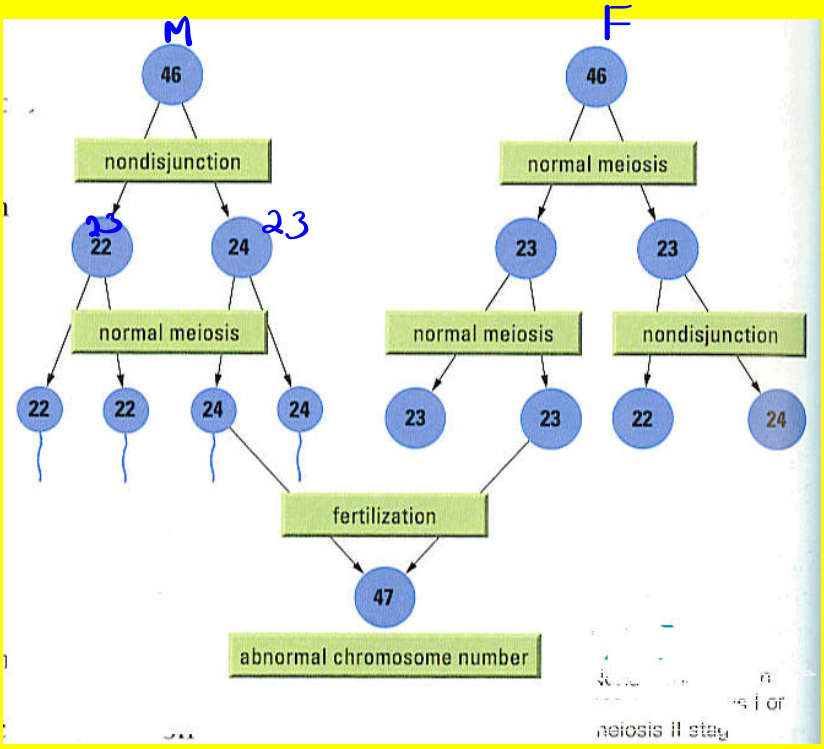

Genes__Genetics__and_DNA

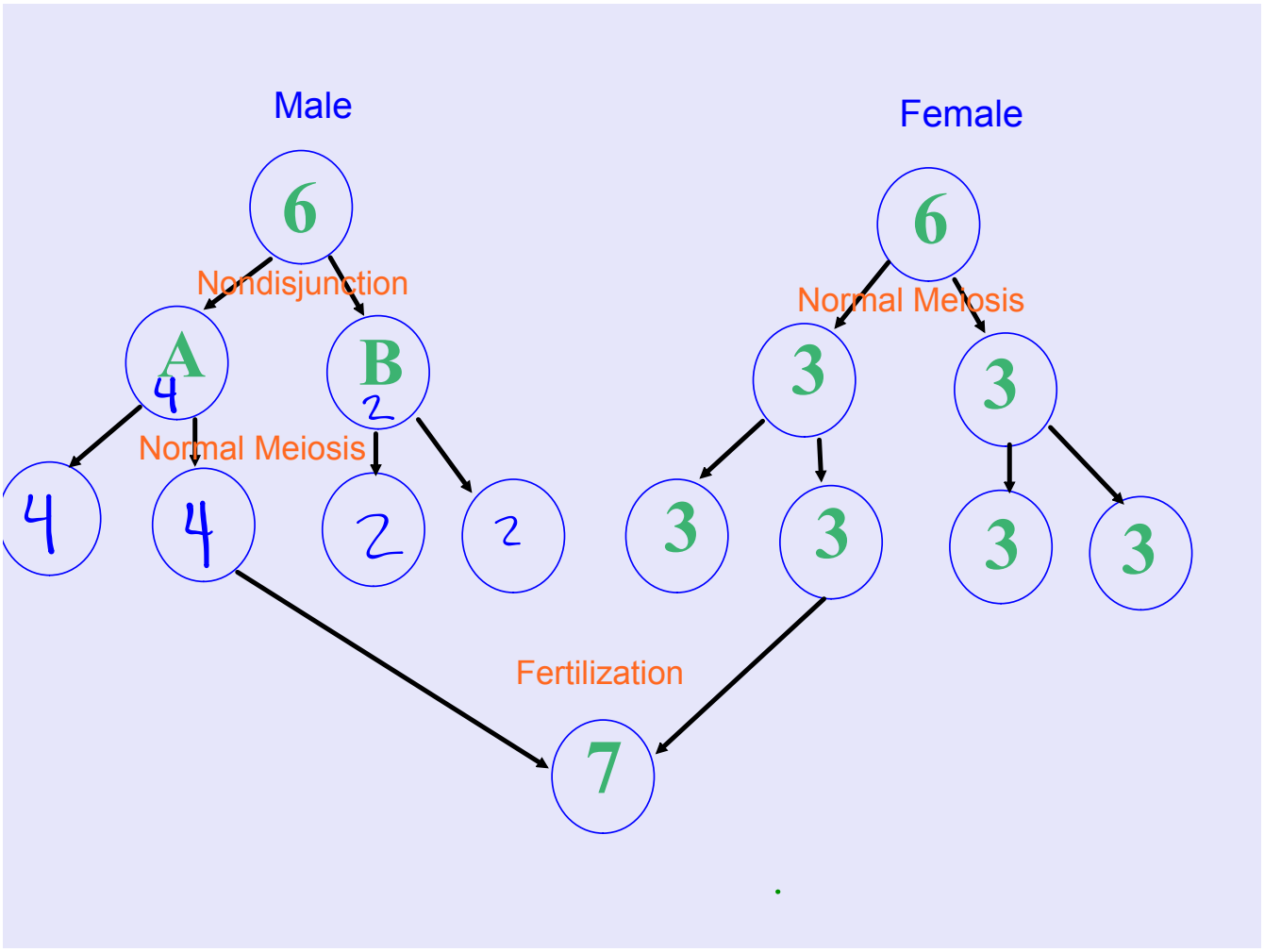
Atypical Meiosis

Most processes of the body can go wrong, including cell division. If errors occur during division of somatic cells, such as a skin cell or liver cell, it may not harm he organism, which has many other cells.

However, if something goes wrong during meiosis in a reproductive cell, the resulting embryo is in serious trouble: all of its cells will be affected

Sometimes during meiosis, a mistake happens, in which chromosomes get stuck and do not seperate. As a result the reproductive cells don't get the right number of chromosomes. This is called nondisjunction.




Male
6
Nondisjunction
A
4
B
2
Normal Meiosis
4
4
2
2
Female
6
Normal Meiosis
3
3
3
3
3
3
Fertilization
7

Note:
Cells that lack genetic information or have too much information will not function properly

This type of problem can come from either the mother or the father. The resulting imbalance of genetic material gives the fertilized egg too little or too much genetic information.

Examples of nondisjunction include

DOWN SYNDROME: an extra 21st chromosome, a trisomic disorder where a person has too much genetic information. Many varying traits such as full face, short, large forehead. Affects 1 in 600 babies. Mothers over 40 years of age have a 1 in 40 chance of having a Down Syndrome baby.

Danaya is my Best Student

Attachments

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