Name _____ Date _____ Period _____

ZornScience
zornscience.org

Chromosomal Disorders and Karyotypes

Biology

Show your work in the blank space. Use complete sentences where asked.

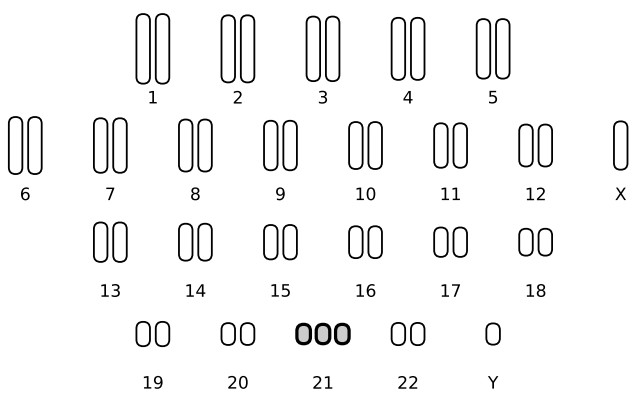
1. During meiosis in a sperm-producing cell, nondisjunction of chromosome 21 happens in the second division. A typical egg has 23 chromosomes.

(a) How many chromosomes are in each of the four sperm cells?

(b) If a sperm with 24 chromosomes fertilizes a typical egg, how many chromosomes are in the zygote?

2. The drawing is a karyotype (a drawn model).

Schematic karyotype (a drawn model)



(a) How many chromosomes does the cell have?

(b) Which pair has a different number of chromosomes from the others? How many copies are there?

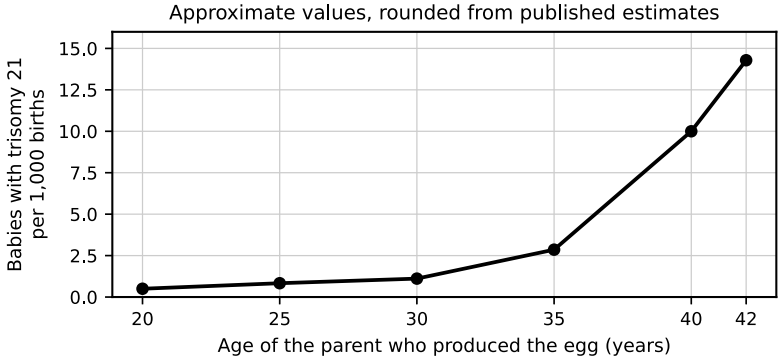
(c) Write the karyotype in the form total number, sex chromosomes, change.

CC BY-NC-SA 4.0 | zornscience.org

3. Write the karyotype for a person with 47 chromosomes who has two X chromosomes and one Y chromosome.

A different person has the karyotype 45,X. Which chromosome is missing compared with 46,XX?

4. The graph shows approximate, rounded values for the chance of a baby with trisomy 21 by the age of the parent who produced the egg.



(a) About how many babies with trisomy 21 per 1,000 births are expected at age 35?

(b) Write a claim, evidence, reasoning statement about how the chance changes with age.

5. Explain what nondisjunction is and why it changes the chromosome number of the zygote.

CC BY-NC-SA 4.0 | zornscience.org