

Construct a Karyotype of Tasmanian Devil Chromosomes

A tasmanian devil is a small carnivorous marsupial that lives in Australia. Marsupials are animals that have pouches where they raise their young. They have 14 chromosomes which occur in 7 pairs which includes the sex chromosomes, X and Y.



The chromosomes below are unsorted, as might be seen on a slide contained tasmanian devil cells that are undergoing mitosis. Your task is to construct a **KARYOTYPE** of these chromosomes.

Task 1: Build the Karyotype

1. Cut the chromosomes with scissors (to save time, you don't need to cut them exactly)
 2. Find the matching **HOMOLOGS**. These are pairs of chromosomes that are the same size and have the same banding pattern.
 3. Arrange the pairs in order from largest set to smallest and number them from 1 to 7.
 4. Glue or tape them to a blank page and place your name on the page with the title "Tasmanian Devil Karyotype." Staple it to the questions attached to this page.
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Modeling Chromosomes with the Tasmanian Devil

Use your model to answer the following questions.



1. What is the **DIPLOID** number for the tasmanian devil? _____
This is the total number of chromosomes found in body cells.

2. How many **homologous pairs** are there? _____
 Describe how you find the matching homologous pairs. What details of the chromosome did you use?

3. Tasmanian devils have **sex chromosomes** similar to humans. The last set is the sex chromosomes where females have two similar chromosomes, XX, and males have an X and a Y. The Y chromosome is much smaller than the X chromosome.

Look at the last set of chromosomes, #7. Do you have a male or a female? _____

How do you know? _____

4. Body cells go through **meiosis** to create sex cells which are HAPLOID.
 How many chromosomes would be found in a sperm or an egg of a tasmanian devil? _____
5. During the process of meiosis, chromosomes are divided evenly, so that the sex cell receives ONE chromosome from each homologous set. Sketch what a sperm cell would look like which includes the chromosomes. Use your karyotype as a guide.

Task 2: Modeling TRISOMY

In humans, trisomy of chromosome #21 causes **Down syndrome**. This occurs when there is an extra chromosome in a set. Tasmanian devils don't get Down syndrome but it is possible that errors in cell division could result in **TRISOMY**, when there are three chromosomes in a set instead of two.

6. The following chromosome was located in a karyotype, cut it out and place it on your normal karyotype. Place the extra chromosome on your model at the appropriate place.

What chromosome # is it? _____

8. Why is this condition called TRISOMY?