

↑ cell during cytokinesis

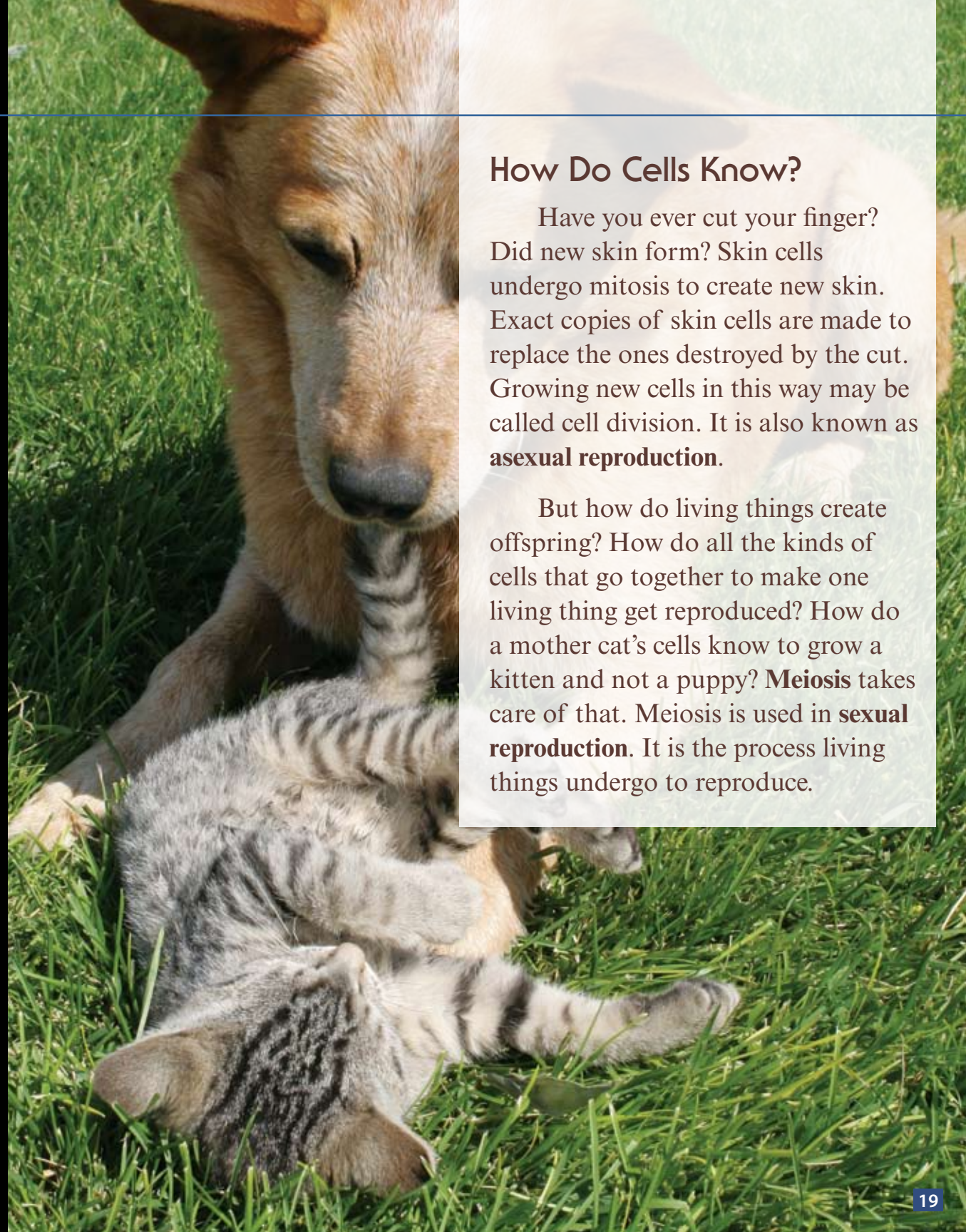
Cytokinesis

Cytokinesis is the final phase of mitosis.

Remember the dent in animal cells at the end of telophase? It is actually a fiber ring made of a protein. The protein is called **actin**. This ring pinches the cell into two **daughter cells**.

In plant cells, a cell plate forms down the center of the cell. The cell breaks apart along the cell plate. This forms two daughter cells.

Nearly all cells go through mitosis. It helps cells grow. It helps repair and replace cells. But something very important is missing.



How Do Cells Know?

Have you ever cut your finger? Did new skin form? Skin cells undergo mitosis to create new skin. Exact copies of skin cells are made to replace the ones destroyed by the cut. Growing new cells in this way may be called cell division. It is also known as **asexual reproduction**.

But how do living things create offspring? How do all the kinds of cells that go together to make one living thing get reproduced? How do a mother cat's cells know to grow a kitten and not a puppy? **Meiosis** takes care of that. Meiosis is used in **sexual reproduction**. It is the process living things undergo to reproduce.

What Is Meiosis?

Meiosis is the division of special kinds of cells. It is also called sexual reproduction.

Unlike mitosis, meiosis produces four cells. They are called **gametes**. Each daughter cell contains half the DNA from the parent cell. You can think of gametes as half-cells.

There are many organisms that have cells that undergo meiosis. Seaweed, fungi, and plants do. Animals do, too. Meiosis makes human egg cells in females and sperm cells in males. Flowering plants undergo meiosis. Meiosis makes **megaspore** cells in the flower's ovaries. It makes **microspore** cells in the stamens.

Sperm and egg cells are gametes. →
They are made through meiosis.

How Many Chromosomes?

Mitosis creates new cells. In humans, each cell contains all 46 chromosomes. Meiosis creates cells, too. But these cells each have only 23 chromosomes. Then, two sex cells can join together. They create a new organism. It will have a new set of 46 chromosomes that no one has ever had before.



Gila monster



seaweed

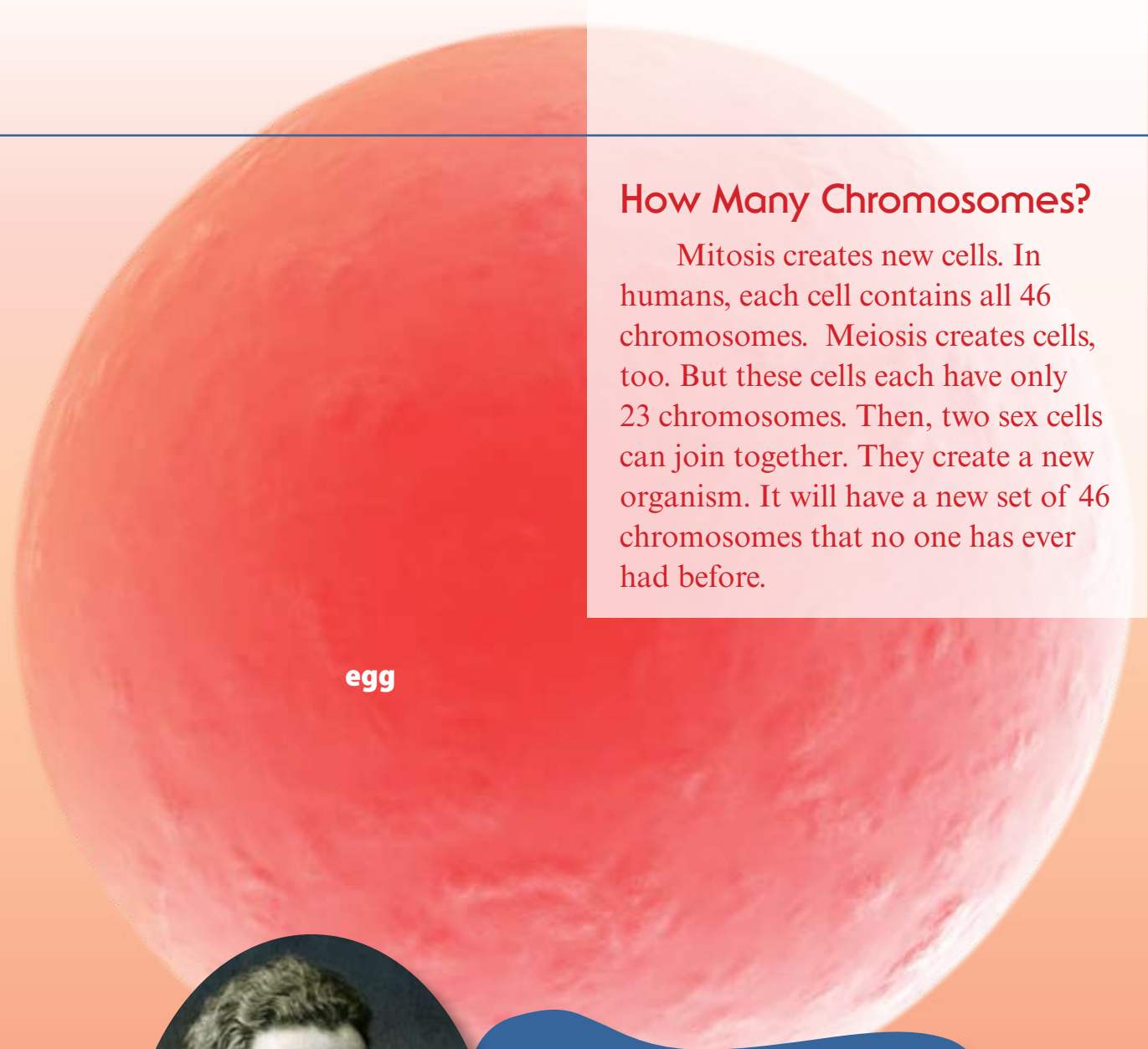


fungus



horse and foal

↑ Many different species use sexual reproduction to create new, unique offspring.

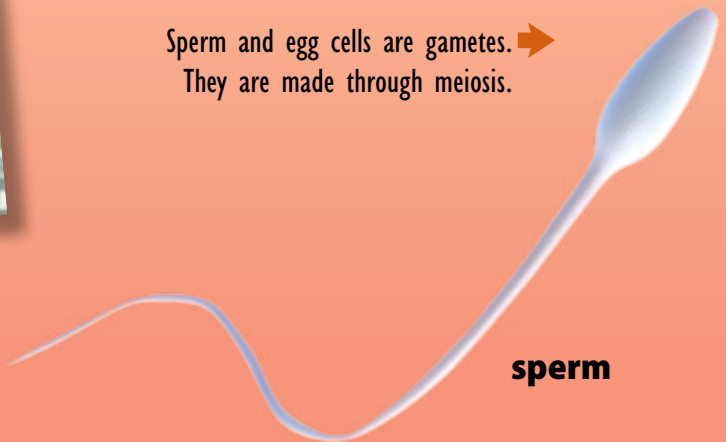


egg



August Weismann

August Weismann was a scientist. He studied cell division of sex cells. He was the first to realize it had to be different than mitosis. If not, how could they end up with just half the total number of chromosomes? He called this special division of sex cells "reduction division."



sperm