

Traits Travel Forward

Read how meiosis prepares inherited information for a new generation.

LS.10.b "the role of meiosis is to transfer traits to the next generation; and"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the fifth sentence in paragraph 2 and the last sentence in paragraph 3. These sentences explain how meiosis helps a parent's genes reach the next generation.

From Parent Cells to Offspring

- ① Traits such as seed color in pea plants are influenced by genes, pieces of DNA found on chromosomes. Before a pea plant makes reproductive cells, it has pairs of chromosomes, one chromosome of each pair from each parent. Meiosis is a special cell division that reduces the chromosome number by half. It produces reproductive cells called gametes. In flowering plants, pollen carries male gametes, while ovules contain female gametes. Each gamete receives one chromosome from every original pair.
- ② When fertilization occurs, a male gamete and a female gamete join. Their chromosomes combine, restoring the usual paired chromosome number in the new plant cell. That cell can grow into an offspring. Because each parent contributed a gamete, the offspring receives genes from both parents. Thus, meiosis prepares the cells that carry inherited information forward without doubling the chromosome number in every generation. The genes in those gametes can affect traits the offspring may show, such as flower color or plant height.
- ③ Meiosis also creates genetic differences among gametes. Before chromosome pairs separate, matching chromosomes can exchange small DNA sections. In addition, each gamete receives a different combination of chromosomes from the parent. These processes mean that sibling offspring usually do not receive identical sets of genes. Meiosis does not decide which trait an offspring will show by itself. Environmental conditions and interactions among genes can also affect traits. Still, meiosis is essential because it places a parent's genes into gametes that can become part of the next generation.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What happens to chromosome number during meiosis, and what type of cells does meiosis produce?

2 What happens to chromosome number when a male and female gamete join at fertilization?

3 How does an offspring receive genes from both parents?

4 Name two processes described in the passage that can make gametes genetically different from one another.

3 YOUR TURN _____ Your own words

Invent a fictional animal species and explain how meiosis and fertilization allow two parents' genes to reach one offspring. Write 3 or 4 sentences that include gametes, the half chromosome number, fertilization, and one possible inherited trait.

PART 1 • READ AND MARK

Underline the fifth sentence in paragraph 2 and the last sentence in paragraph 3. These sentences explain how meiosis helps a parent's genes reach the next generation. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What happens to chromosome number during meiosis, and what type of cells does meiosis produce?	Meiosis reduces the chromosome number by half and produces gametes, or reproductive cells.
2	What happens to chromosome number when a male and female gamete join at fertilization?	Their chromosomes combine, restoring the usual paired chromosome number in the new cell.
3	How does an offspring receive genes from both parents?	Each parent contributes a gamete, and the gametes join at fertilization.
4	Name two processes described in the passage that can make gametes genetically different from one another.	Matching chromosomes can exchange small DNA sections, and each gamete can receive a different combination of chromosomes.

PART 3 • YOUR TURN (SAMPLE ANSWER)

In a made-up species called gliders, each parent uses meiosis to make gametes with half its chromosome number. At fertilization, one gamete from each parent joins, restoring pairs of chromosomes in the first offspring cell. The offspring receives genes from both parents and may inherit a trait such as striped fur.

Accept equivalent wording that accurately describes meiosis making haploid gametes and fertilization restoring paired chromosome number. For the open response, accept any fictional organism and plausible trait if all required meiosis and fertilization ideas are included.