# What Is Sexual Reproduction?

Worksheet

Sexual reproduction combines a sperm and an egg (gametes), each carrying half the normal chromosome number, through fertilization to produce a genetically unique offspring with traits from both parents.

## Questions

1. How many parents are needed for sexual reproduction?

A) One
B) Two
C) Three
D) None

2. What cell division process produces gametes?

A) Mitosis
B) Binary fission
C) Meiosis
D) Budding

3. Why are offspring from sexual reproduction genetically unique?

A) They are exact clones of one parent
B) Gene shuffling in meiosis plus random fertilization create new combinations
C) Mutation is the only source of variation
D) Offspring only inherit genes from the mother

4. If a sperm (n=23) fertilizes an egg (n=23) in humans, what is the chromosome number of the zygote?

A) 23
B) 46
C) 69
D) 92

5. A human sperm cell (23 chromosomes) fertilizes an egg cell (23 chromosomes). How many chromosomes does the resulting zygote have?

6. Two pea plants are crossed: one is tall (dominant, T) and one is short (recessive, t), both heterozygous (Tt). What fraction of offspring are expected to be tall?

7. Why do full siblings from the same two parents still look different from each other?

8. Define: What is sexual reproduction?

9. Define: What is a gamete?

10. Define: Why does sexual reproduction increase genetic variation?

# Answer Key

1. B) Two - Sexual reproduction requires gametes from two parents to combine.

2. C) Meiosis - Meiosis halves the chromosome number, producing haploid gametes.

3. B) Gene shuffling in meiosis plus random fertilization create new combinations - Independent assortment, crossing over, and random fertilization combine to create genetic variety.

4. B) 46 - 23 + 23 = 46, restoring the full diploid chromosome number.

5. 1) Each gamete is haploid, produced by meiosis: 23 chromosomes 2) Fertilization fuses sperm and egg nuclei 3) 23 (sperm) + 23 (egg) = 46 chromosomes 4) The zygote is diploid with the full human chromosome number (46), ready to develop into an embryo.

6. 1) Each Tt parent produces gametes T and t in equal proportion 2) A Punnett square cross of Tt Tt gives genotypes: TT, Tt, Tt, tt 3) TT and Tt (3 out of 4) show the dominant tall trait; tt (1 out of 4) is short 4) About 3/4 (75%) of offspring are expected to be tall.

7. 1) During meiosis, each parent shuffles their chromosomes (independent assortment and crossing over) 2) Each egg or sperm cell ends up with a different combination of genes 3) Fertilization randomly pairs one sperm with one egg 4) This combination of shuffling and random fertilization means each sibling inherits a unique mix of genes from both parents.

8. Reproduction where two parents' gametes fuse during fertilization to form a genetically unique offspring.

9. A haploid sex cell (sperm or egg) produced by meiosis, carrying half the normal chromosome number.

10. Because meiosis shuffles genes and fertilization randomly combines gametes from two different parents.