

Inside Strawberry Cells

Trace how DNA instructions connect parents and offspring.

SC.7.L.16.1 "Understand and explain that every organism requires a set of instructions that specifies its traits, that this hereditary information (DNA) contains genes located in the chromosomes of each cell..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each sentence that explains how genes, DNA, and chromosomes are organized. Write 1 and 2 beside the two ways a new strawberry plant receives hereditary instructions.

Instructions From Plant to Plant

- ① Every living organism needs hereditary instructions for building, running, and repairing its body. These instructions help specify traits, such as leaf shape in a strawberry plant or fur pattern in a fox. The instructions are stored in DNA, a molecule found in most cells. DNA does not float as one loose strand. In a cell, DNA is tightly coiled and packaged into chromosomes. A gene is a section of DNA that contains instructions related to a trait. Many genes are located along each chromosome.
- ② When a strawberry plant makes seeds, a new plant receives hereditary information from the parent plants. The offspring's cells contain chromosomes with DNA and genes, so the new plant can develop its own traits. Strawberries can also make new plants from runners, horizontal stems that grow into plantlets. A runner-grown plant receives DNA from the parent plant and is usually genetically identical to it. Both seed production and runner growth show heredity, the passage of hereditary instructions from one generation to the next.
- ③ Traits are not passed because an offspring simply looks like its parent. Instead, DNA is copied and passed on when new organisms form. During seed production, each parent contributes hereditary information. In runner growth, the new plant develops from the parent plant's tissues and receives a copy of that parent's DNA. Environments can affect how some traits appear, but they do not replace the DNA instructions inherited by the new plant. Heredity connects the instructions in parents to traits in offspring.

2 ANSWER WITH EVIDENCE Use the passage

1 How are a gene, DNA, and a chromosome related?

2 What are the two ways described that a strawberry plant can produce a new plant?

3 Why is a runner-grown strawberry plant usually genetically identical to its parent plant?

4 According to the passage, how can the environment affect traits without replacing heredity?

3 YOUR TURN Your own words

Invent an organism and one trait. Write exactly three sentences: name the trait, explain that its gene is a section of DNA packaged in a chromosome, and describe how DNA instructions pass from a parent to an offspring through either sexual or asexual reproduction.

PART 1 • READ AND MARK

Underline each sentence that explains how genes, DNA, and chromosomes are organized. Write 1 and 2 beside the two ways a new strawberry plant receives hereditary instructions. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How are a gene, DNA, and a chromosome related?	A gene is a section of DNA. DNA is tightly coiled and packaged into chromosomes, and many genes are located along each chromosome.
2	What are the two ways described that a strawberry plant can produce a new plant?	A strawberry plant can make a new plant through seeds or through runners that grow into plantlets.
3	Why is a runner-grown strawberry plant usually genetically identical to its parent plant?	It receives DNA from the parent plant as it develops from the parent's tissues.
4	According to the passage, how can the environment affect traits without replacing heredity?	The environment can affect how some traits appear, but it does not replace the DNA instructions inherited by the new plant.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A desert lizard has a trait for striped skin. The instructions for stripes are in a gene, which is a section of DNA packaged in a chromosome in the lizard's cells. When lizard parents reproduce sexually, hereditary DNA instructions pass to their offspring.

Accept equivalent explanations that correctly state that genes are sections of DNA and that DNA is packaged into chromosomes. In the open response, accept any accurate organism, trait, and sexual or asexual heredity example.