19.1 Genes Genetics and Chromosomes

Biology

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction

Summarize your understanding of each paragraph.

Genetics is the study of genes, genetic variation, and heredity in living organisms. It is generally considered a field of biology. The father of genetics is Gregor Mendel, a late 19th-century scientist and Augustinian friar

Trait inheritance and molecular inheritance mechanisms of genes are still primary principles of genetics in the 21st century. Genetics has given rise to a number of subfields. Organisms studied span the domain of life, including bacteria, plants, animals, and humans.

Genetic processes work in combination with an organism's environment and experiences to influence development and behavior, often referred to as nature versus nurture.

A classic example is two seeds of genetically identical corn, one placed in a temperate climate and one in an arid climate. The one in the arid climate only grows to half the height of the one in the temperate climate due to lack of water and nutrients.

https://en.wikipedia.org/wiki/Genetics

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Allele

1

2

An allele is a variant form of a given gene. Sometimes, different alleles can result in different observable phenotypic traits, such as different pigmentation. A good example of this trait of color variation is the work Gregor Mendel did with the white and purple flower colors in pea plants; discovering that each color was the result of a “pure line” trait which could be used as a control for future experiments. However, most genetic variations result in little or no observable variation.

The word "allele" is a short form of allelomorph which was used in the early days of genetics to describe variant forms of a gene detected as different phenotypes.

https://en.wikipedia.org/wiki/Allele

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

America's Elite Cows Don't Give Birth — Their Surrogates Do

Embryo transfer, which maximizes the number of offspring a female can reproduce, was first successfully reported in rabbits in 1890. Walter Heape, a pioneer in reproductive biology from England, collected embryos from a black rabbit and inserted them into a white rabbit. A month later, the white rabbit gave birth to a litter of black bunnies. The first ET calf, born in Wisconsin, came along in 1951.

Panda, standing six feet tall and weighing almost a ton, is everything a show cow should be: broad-backed and round-rumped, with sturdy legs holding up her heft. Her hide — thick and black, with splotches of creamy white — fits her name.

"She's a big-time cow," says Dan Byers, owner of Byers Premium Cattle, Inc. "She's a freak of nature is what she is.“

Because of her impeccable physique, Panda's descendants sell for a high price. Byers, an elite-cattle breeder in Roseville, Ill., owns several of Panda's daughters. He sold one of her grand calves last year for $10,000 to a family in Oklahoma that shows cattle at state fairs and national competitions.

Cows, like humans, take about nine months to carry a calf to term. At 8 years old, Panda should have seven calves. But in the 1970s, American cattlemen began bucking the reins of nature's limitations by performing a procedure called embryo transfer, or ET, as it's referred to in the industry.

Now, elite-cattle breeders and commercial beef and dairy producers use ET to reproduce dozens of calves a year from their genetically superior heifers, who never actually have to birth a single calf. Surrogates carry the embryos to term.

The process can be time consuming and costly. But Byers, who has bred his genetically superior cattle this way for six years, says it can pay off in the long run.

ET entails several steps. First, the cow's owner injects her with a series of hormones, so she'll produce multiple eggs.

Next, she's bred by a choice stud bull — either the old-fashioned way or, more typically, through artificial insemination. The fertilized eggs, or embryos, are complete genetic packages carrying the bull and dame cow's traits.

http://www.npr.org

Draw Illustration

Copy and Label the Illustration in the Space Provided

Illustration

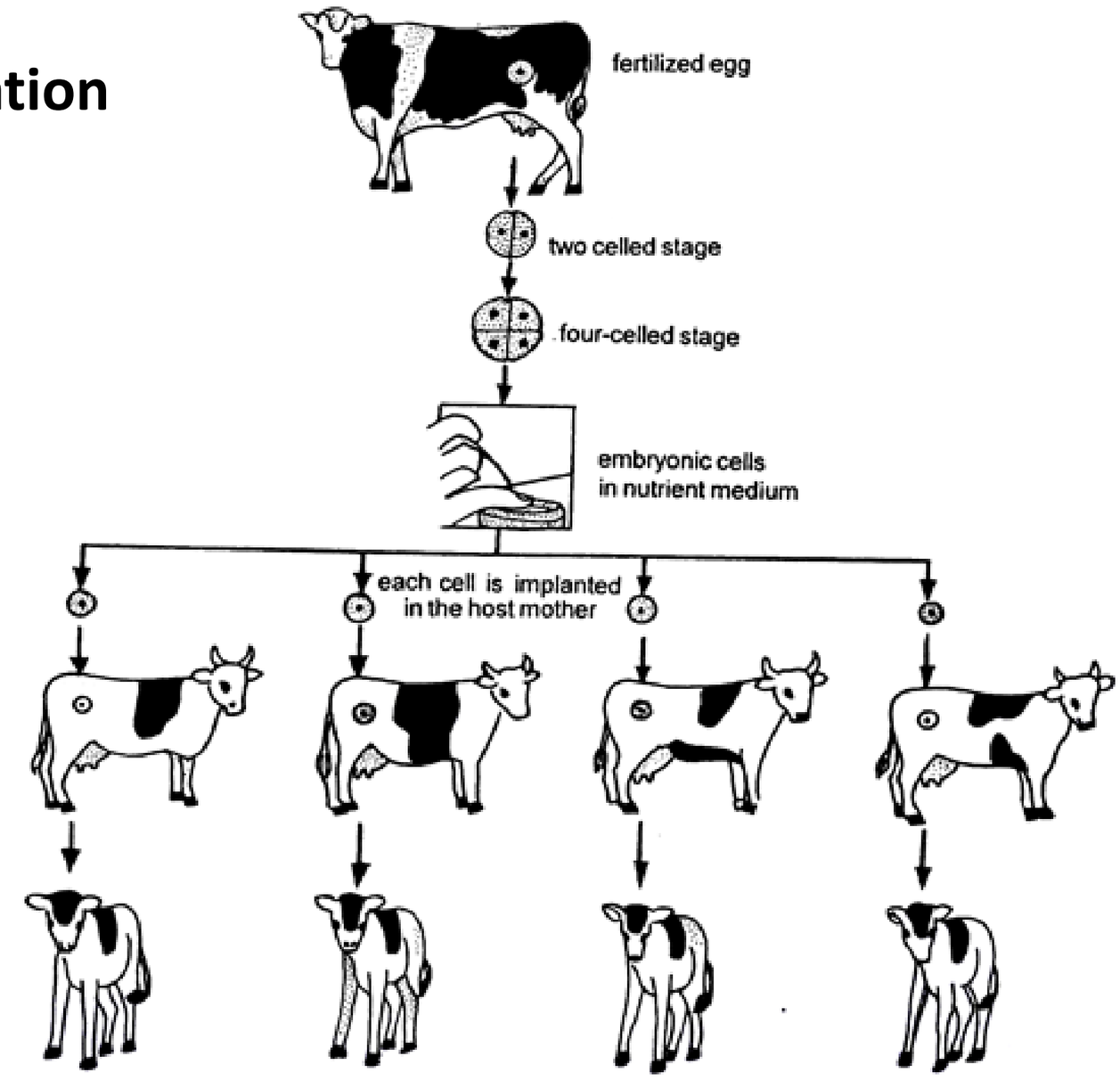


Fig. 8.16. Japanese method of cloning cattle.

http://www.biologydiscussion.com/

Draw (Copy) the Illustration Here

Interpret a Graph

Write the title of the graph _____

Circle the type of chart this represents

Bar Chart *Line Chart* *Pie Chart* *Other*

If applicable,

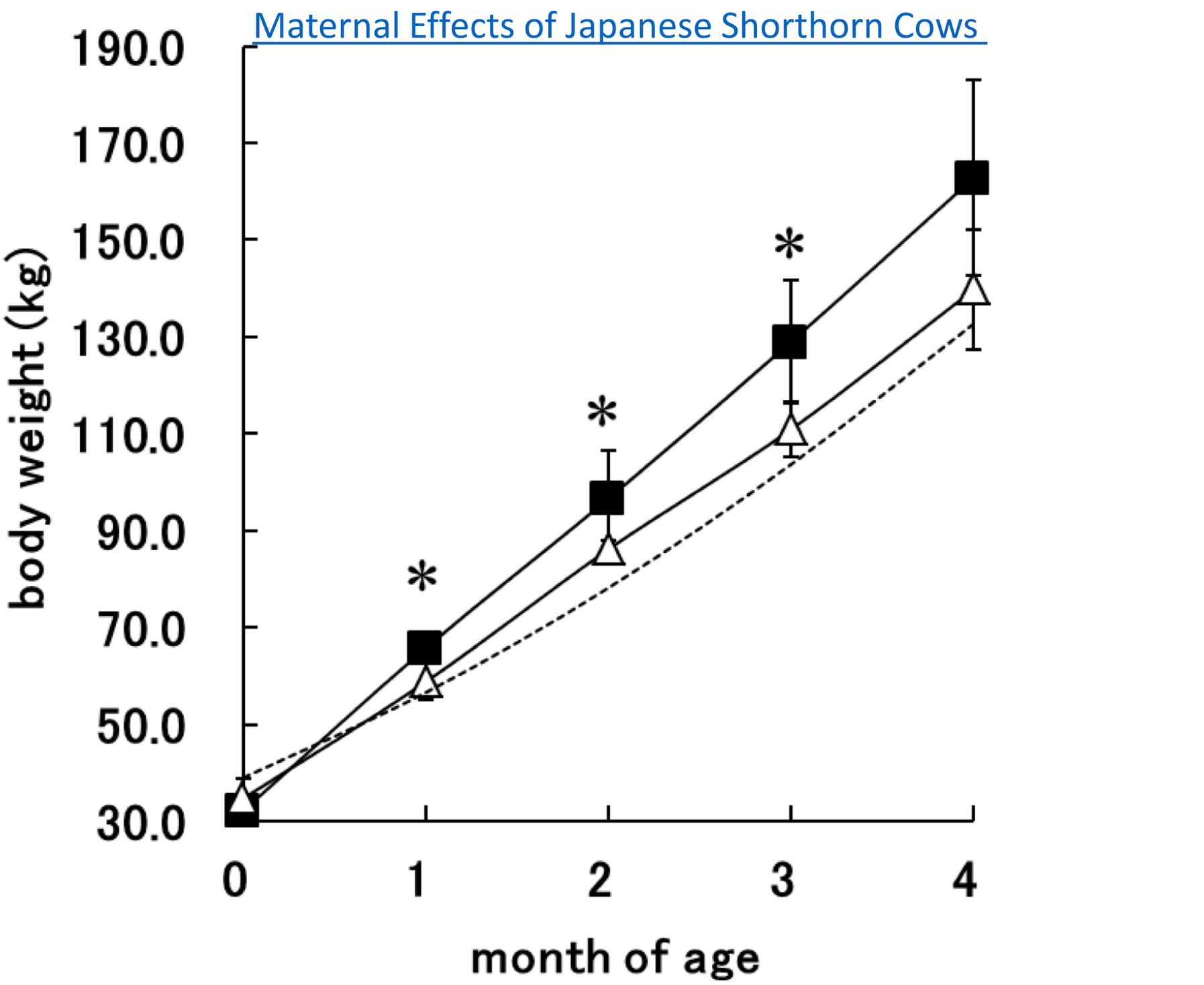
What does the X-axis represent _____

What does the Y-axis imply _____

Summarize what this graph represents or conveys

_____

https://www.ajas.info/upload//thumbnails/ajas-26-7-930-5f2.gif



Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

1.
2.
3.
4.
5.
6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.