

## Lesson 11 Study Guide

1. In the 1860s Gregor Mendel discovered “factors” that determined inheritance of traits in plants (notice how many great discoveries appear first from work on plants) and by 1906 Thomas Hunt Morgan showed that ‘genes’ are the “factors” that Mendel had discovered, and that genes are located on chromosomes. Then in 1944 Oswald Avery showed that genes are made of DNA! (We have come a long way). We now know all the genes in:

- (A) humans, gorillas and chimpanzees
- (B) zebrafish and pufferfish
- (C) mice, rats, and dogs
- (D) rice, tomato and corn plants
- (E) all of these examples, and more

2. Nearly all the plants available in US grocery stores do not grow in ‘the wild’. Most of our cultivated plants are the result of intensive human intervention over many generations to select for desirable traits, and most of these plants would not even exist without humans. Hybrid corn was first commercialized on a large scale in the US in the 1930s and now, because of vastly improved yields hybrid corn varieties dominate the \$52 billion yr corn crop in the US. Hybrid corn:

- (A) is the product of genetic engineering by insertion of foreign DNA
- (B) was first developed in the Fertile Crescent ~20,000 yrs ago
- (C) is the product of conventional plant breeding involving the use of controlled crosses and in some plants, like corn, by developing inbred parental lines
- (D) is a method used by the large seed companies only to prevent farmers from re-planting their seed and thus used to control the corn seed industry
- (E) is all GMO and should be labeled

3. Most of the plants we eat as fruits, vegetables, and grains:

- (A) grow in the wild, but do better under agricultural situations
- (B) do not occur in the wild, but have been developed exclusively by humans through selection and domestication
- (C) have proven harmful to humans because domestication has increased their allergenicity
- (D) have been genetically modified using biotechnology approaches
- (E) have been robbed of their basic nutritional value compared with their wild relatives

4. The domestication and breeding of dogs is similar in some ways to the domestication of crop plants. The Asian wolf is now accepted as the most likely ancestor of all domestic dogs. There are over four hundred described breeds of dogs today, which can be all genetically traced back to a wild Asian species that lived between 15,000 and 40,000 years ago, before the first agricultural human societies. Similar to the varieties produced of most major crop species, variations in dog breeds:

- (A) came about through natural selection in the wild
- (B) derived from wild ancestors and are the direct consequence of selection by humans
- (C) have been proven to be the result of intelligent design
- (D) occurred naturally in the wild before humans
- (E) demonstrates that new species have not recently occurred on earth

5. Where do the plants we eat come from? Which of the following processes has not been applied to crop plant development during the history of agriculture?

- (A) domestication, varietal selection, and genetics
- (B) direct application of the Theory of Special Relativity and particle physics to induce plant variation
- (C) wide crosses between varieties or species that normally do not mate to produce fertile seeds
- (D) Mutagenesis - the use of chemicals or radiation to induce mutation and genetic variation
- (E) Gene Transfer - the use of cloned DNA fragments for genetic improvement

6. Which trait is considered to be most important to most plant breeders?

- (A) plant height
- (B) color
- (C) fruit taste
- (D) yield
- (E) nutrition