58

DNA Reading Guide

Use pages 207-208 in the paperback textbook with a fly on it.

1.Practically everything a cell does, be it a liver cell, a skin cell, or a bone cell, it does because

of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It is your proteins that make a bone cell act like a bone cell, a liver cell act like

a liver cell, or a skin cell act like a skin cell. In other words, it is the \_\_\_\_\_\_\_\_\_\_\_\_\_ that give an

organism its traits.

2. It is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the protein that determines what it does. And it is the order and type of \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that determine the structure of the protein. And that order and type of amino acids that make up the protein are determined by your DNA \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. The relatively large ­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that never leave the nucleus are made of DNA. And, as

proteins are made on the ribosomes in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, how does the information encoded

in the DNA get to the site of protein synthesis? That’s where RNA comes into this four-player act.

\_\_\_\_\_\_\_\_\_\_\_ → \_\_\_\_\_\_\_\_\_\_\_ → \_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. For almost \_\_\_\_\_\_\_\_ years, scientists have known plenty about proteins. They have known that

proteins of all different \_\_\_\_\_\_\_\_\_\_\_, sizes, and functions exist. For this reason, many scientists

believed that proteins were the \_\_\_\_\_\_\_\_\_\_ material. It wasn’t until 1928, when Frederick

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ identified the process of transformation, that individuals started to question this

concept. Griffith demonstrated that transformation occurs, but couldn’t identify the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ substance. The transforming substance must be the genetic material!

5. Over the next decade, scientists, led by Oswald \_\_\_\_\_\_\_\_\_\_\_\_\_, tried to identify the material

involved in transformation. Avery, together with his colleagues Maclyn McCarty and

Colin MacLeod, performed many \_\_\_\_\_\_\_\_\_\_\_\_\_\_. They discovered that \_\_\_\_\_\_\_\_ was the

heredity material In 1944.

 6. This finding was \_\_\_\_\_\_\_\_ widely accepted, partly because so \_\_\_\_\_\_\_\_\_\_\_\_\_ was known about DNA. It was still thought that proteins were better candidates to be the heredity material. The\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of DNA was still unknown, and many scientists were not convinced that genes from bacteria and more complex organisms could be similar.

7. In 1952, Alfred \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Martha \_\_\_\_\_\_\_\_\_\_\_\_\_ put this skepticism to rest. They conclusively demonstrated that \_\_\_\_\_\_\_\_\_\_ is the genetic material. Hershey and Chase used a \_\_\_\_\_\_\_\_\_\_ that infects \_\_\_\_\_\_\_\_\_\_\_\_\_\_, to prove this point. A virus is essentially DNA (or RNA) surrounded by a protein \_\_\_\_\_\_\_\_\_\_\_\_\_. To reproduce, a virus must \_\_\_\_\_\_\_\_\_\_\_\_\_ a cell and use that host cell’s machinery to make more viruses.

8. Draw and label the figure at the bottom of page 208

9. Hershey and Chase performed a series of classic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, taking advantage of the fact

that a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is essentially just DNA and \_\_\_\_\_\_\_\_\_\_\_\_\_. In the experiments, a virus with either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_DNA or radioactive protein were used to infect bacteria. Either the radioactive proteins or radioactive DNA would be transferred to the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Identifying which one is transferred would identify the genetic material. Only the radioactively labeled DNA was found inside the bacteria. These experiments demonstrated that DNA is the genetic material and that protein does not transmit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ information.