Lesson 5.2 Protein Synthesis: Transcription

Name

Date

Period

Key Terms			
Messenger RNA	Transcription	Ribonucleic Acid	Uracil
Protein Synthesis			

Engage I: Your instructor will pass out cards, which represent the process of transcription. With your group members, determine the sequence of events shown on the card and write the sequence below.

	Step #1	Step #2	Step #3	Step #4	Step #5	Step #6	Step #7	Step #8	Step #9
Corresponding Letter									

Explore I: Your instructor will now show you the video. (http://www.lew-port.com/10712041113402793/lib/10712041113402793/Animations/Protein%20Synthesis%20%20long.swf) Check to make sure your sequence is in order. If it is not in order, put the cards into the correct order as shown on the video. Sketch and write the information shown on each of the cards in the correct order in the appropriate box below.

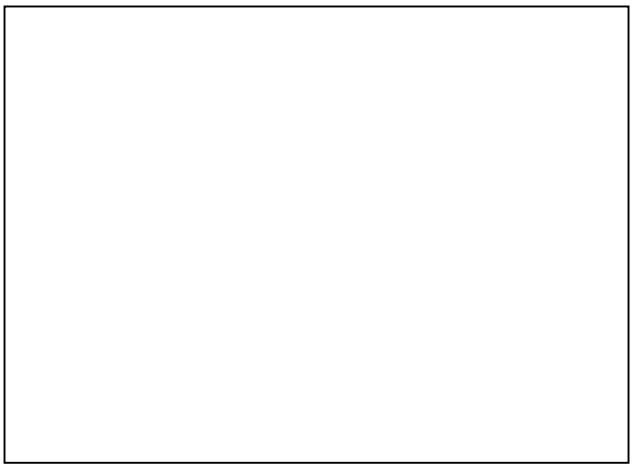
Step 1

Step 2

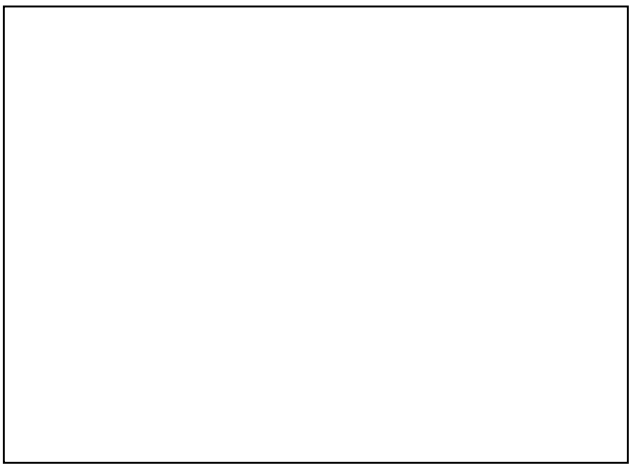
Step 3

Step 4

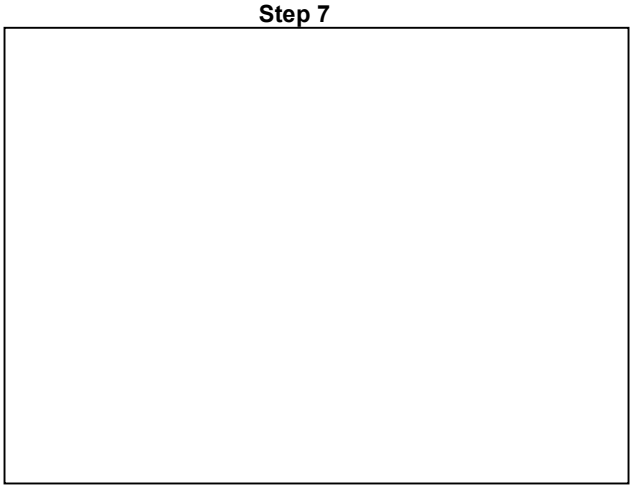
Step 5



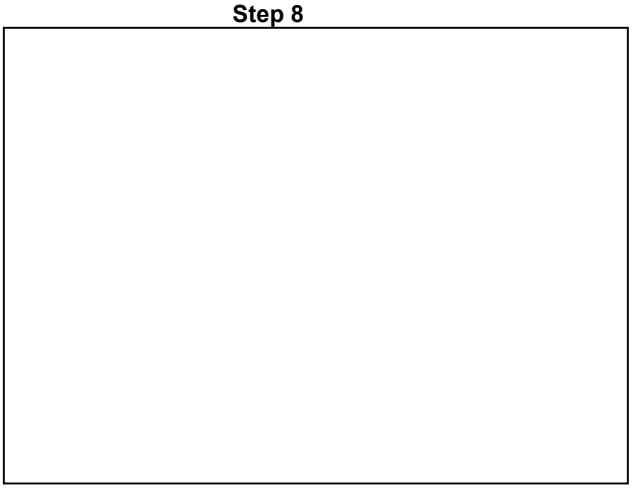
Step 6



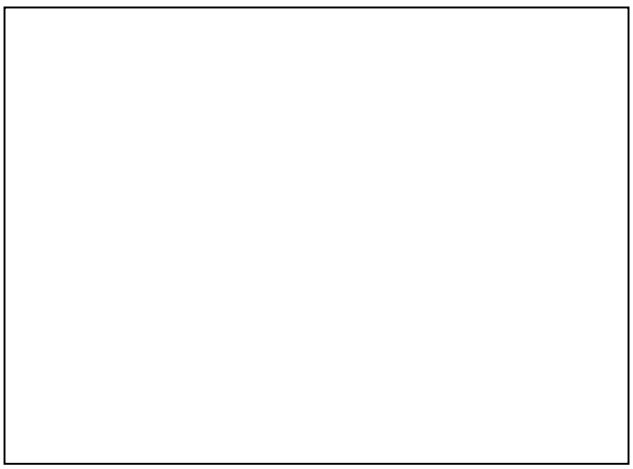
Step 7



Step 8



Step 9



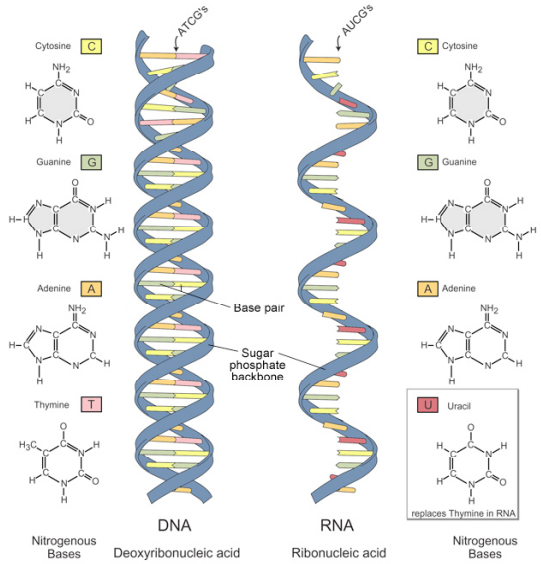


Image adapted from: National Human Genome Research Institute.

DNA and RNA compared

DNA is a twisted double helix with a deoxyribose sugar phosphate backbone. It contains the nitrogenous bases *adenine, thymine, guanine* and *cytosine.*

RNA is a single-stranded helix with a ribose sugar phosphate backbone. It contains the nitrogenous bases *adenine, uracil, guanine* and *cytosine*.

Explain I

1. Which nitrogen base is used in RNA but is not used in DNA? Which DNA nitrogen base does it replace?

2. What are three major differences between DNA and RNA?

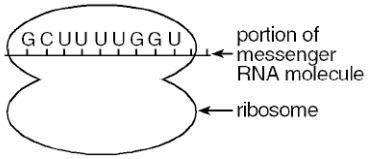
3. Briefly describe in your own words the process of transcription. Use diagrams to aid in your explanation. Be sure to include the location of each of the important steps.

4. Listed below is a sequence of DNA for a normal segment of a hemoglobin gene.

A. Transcribe this sequence into an RNA base sequence.
GTG CAC CTG ACT CCT GAG GAG

B. Now transcribe the sickle cell sequence into RNA.
GTG CAC CTG ACT CCT GTG GAG

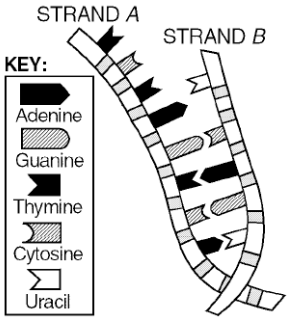
The diagram below represents a portion of a messenger RNA molecule associated with a ribosome. Use this diagram for questions 5-7.



5.The presence of which nitrogen base indicates that the molecule associated with the ribosome is RNA?
a) cytosine
b) adenine
c) uracil
d) guanine

6. The sequence of nucleotides on the RNA molecule was determined by the
a) sequence of amino acids that will be linked together to for a polypeptide chain
b) base sequence of the original DNA molecule that served as a template
c) base sequence of the original messenger RNA molecule that served as a template
d) sequence of nucleotides on transfer RNA molecules

7. The association between the ribosome and the messenger RNA molecule occurs in the
a) nucleolus
b) cytoplasm
c) nucleus
d) centrosome



8. If strand B represents messenger RNA, it would transport the genetic code from the
a) mitochondria t the nucleus
b) ribosome to the nucleus
c) nucleus to the ribosome
d) nucleus to the mitochondria