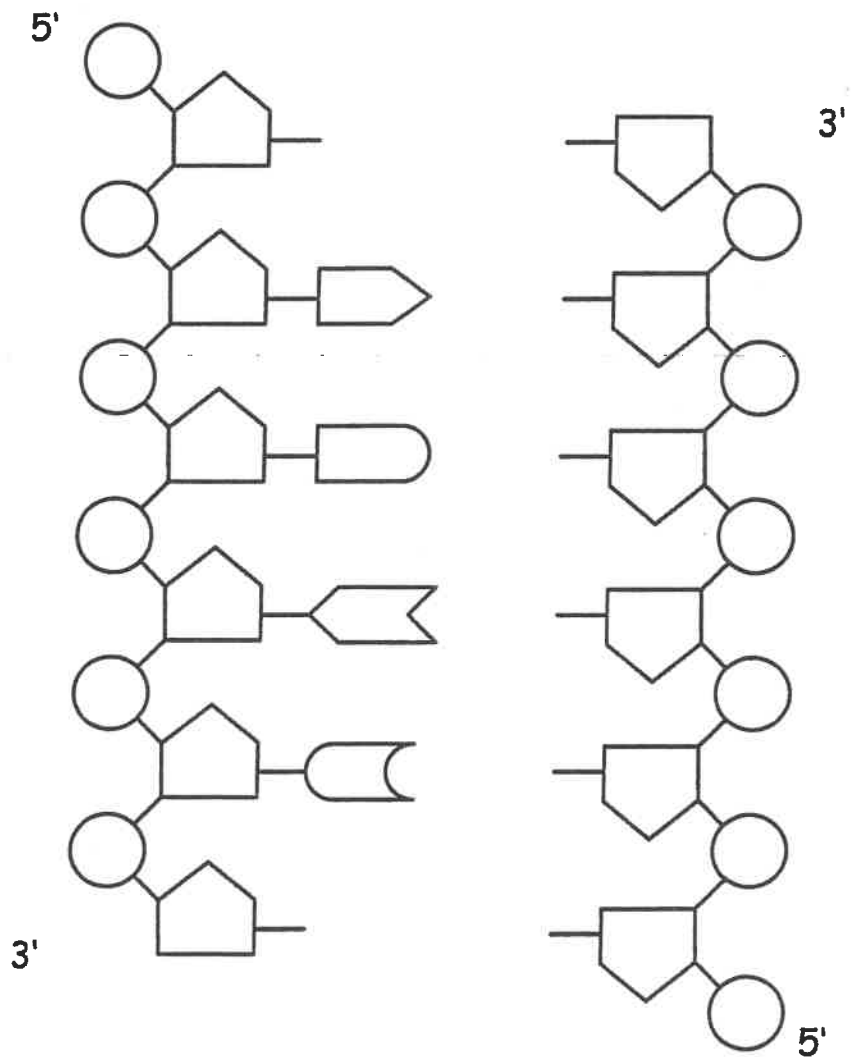
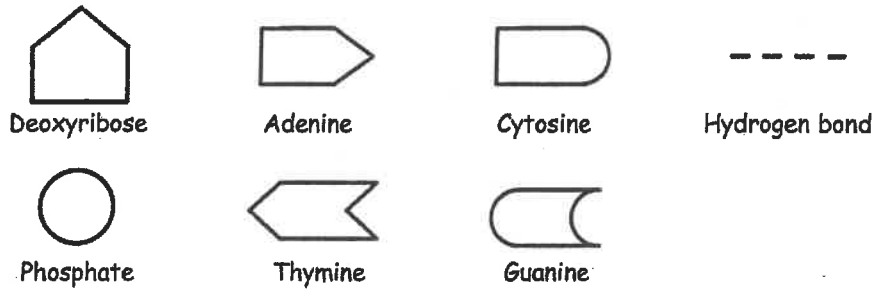


DNA, mRNA and Protein Synthesis (paper/pencil)

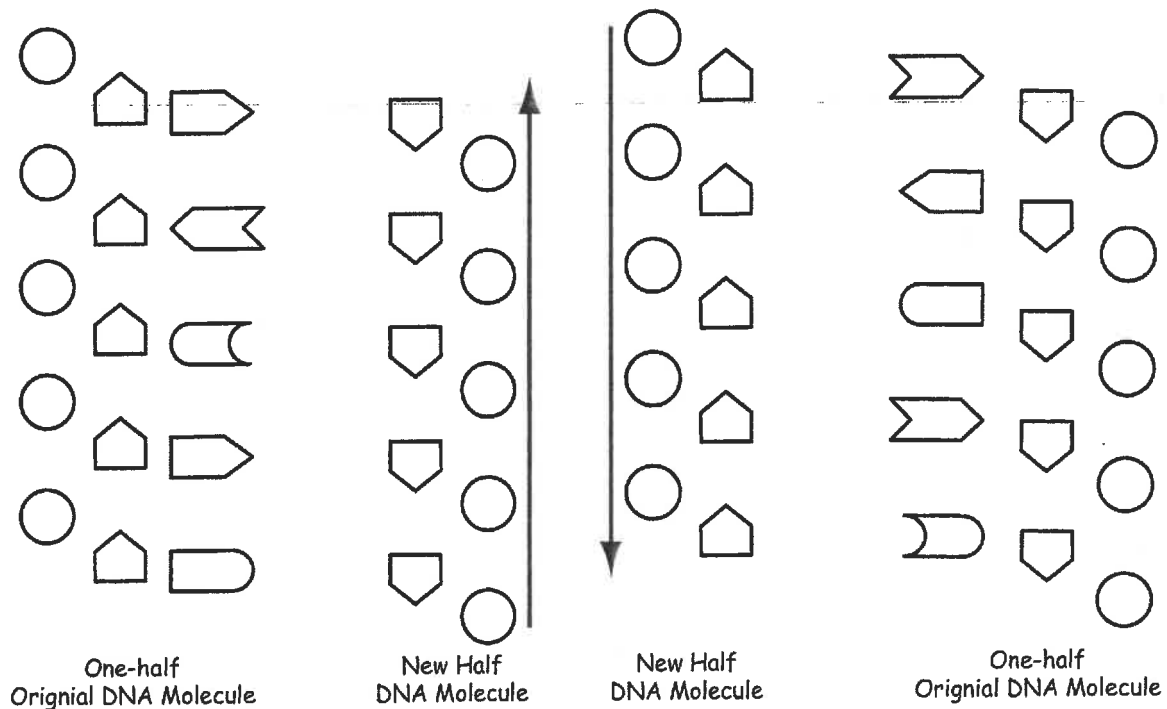
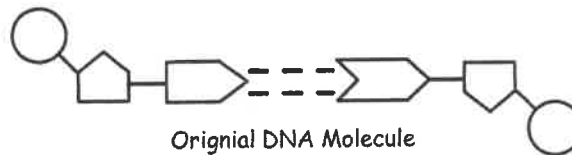
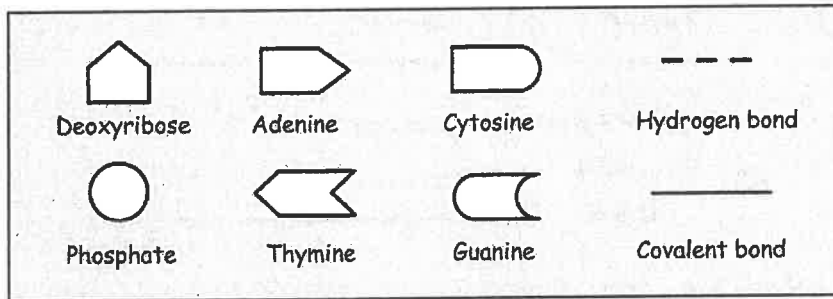
Complete the model of DNA below by drawing the missing nitrogen bases in the nucleotides. Label the structures, design an identification key, and then color the DNA structures based on the key.



DNA Replication

Use the same DNA sequence from the DNA model on the first page to simulate how DNA replicates itself. During replication, the hydrogen bonds between the nitrogen bases are broken and the molecule splits apart at various points along the ladder. Nucleotides attach to the complementary base of the original strand. This continues until all segments of DNA have been copied. The result is two DNA molecules, each composed of an original strand and a newly formed strand.

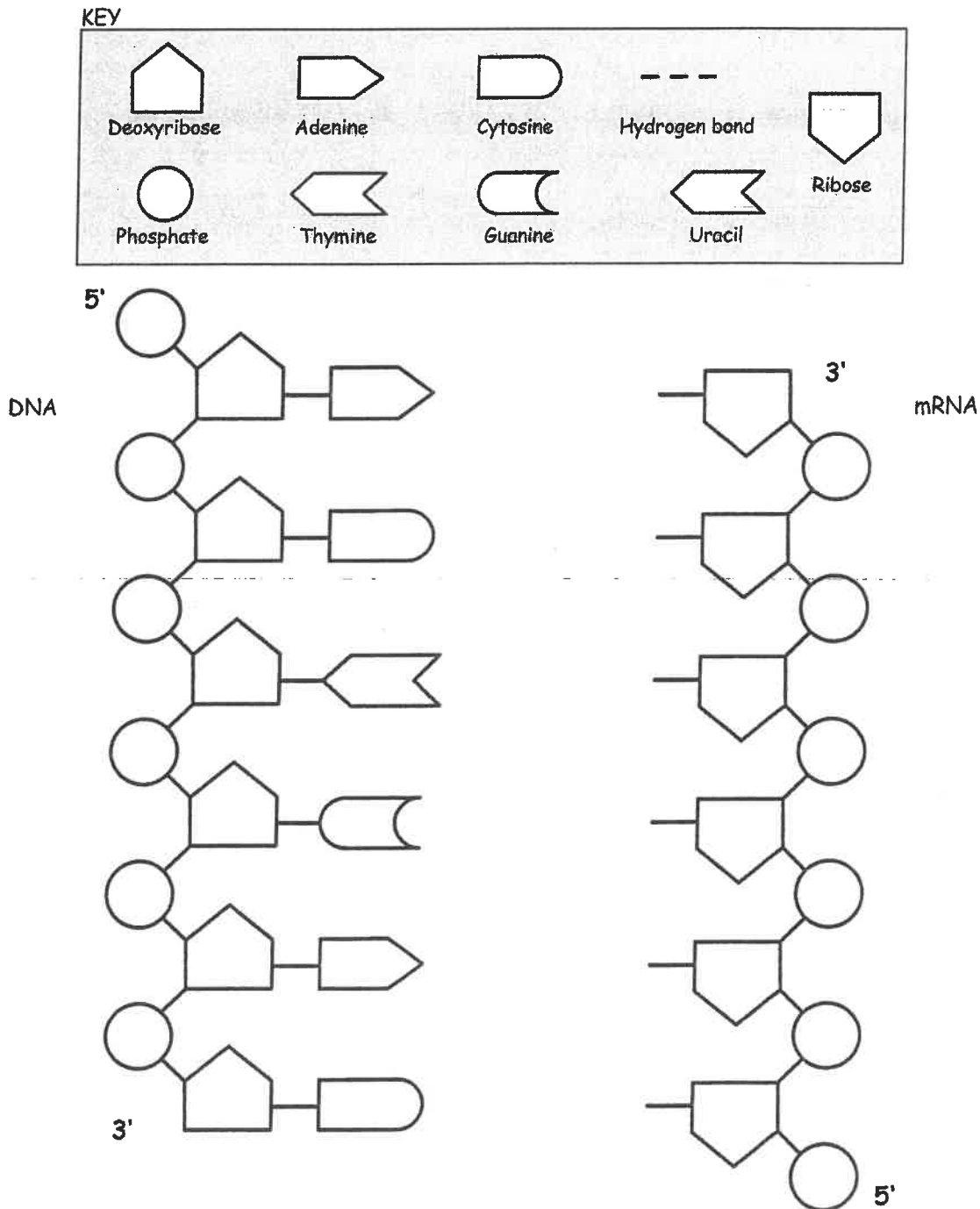
Complete the model of DNA replication below by drawing the missing nitrogen bases in the nucleotides. Show covalent bonding between the phosphate and deoxyribose, and the deoxyribose and the base. Show hydrogen bonding between the nitrogen bases. There are two hydrogen bonds between adenine and thymine, and three hydrogen bonds between cytosine and guanine. Label and color each part of the DNA replication using the same identification key you designed for the DNA model.



Transcription

It is the function of another nucleic acid, called messenger RNA (mRNA), to relay genetic information to the ribosomes. RNA is made when a strand of DNA is used as a template. This process is called transcription. The transcription process is basically the same as replication, except that nucleotides have ribose (R) instead of deoxyribose (hence, RNA instead of DNA), and the nitrogen base uracil (U) is substituted for thymine. The transfer of genetic information is relayed out of the nucleus by messenger RNA (mRNA). The RNA is modified to become an mRNA molecule.

Complete the model of transcription below by drawing the missing nitrogen bases in the mRNA nucleotides. Show hydrogen bonding between the nitrogen bases. There are two hydrogen bonds between adenine and uracil, and three hydrogen bonds between cytosine and guanine. Label and color each part of the transcription process using the same identification key you designed for the DNA model.



Complete Data Table 1 using your knowledge of DNA transcription and the mRNA Genetic Code Wheel or Chart. It is very important that you are comfortable using both the wheel and chart.

Data Table 1

DNA	mRNA	AMINO ACID
TCA	AGU	Serine
CCC		Glycine
		Methionine
GGA	CCU	
	GAG	Glutamic acid
TAA		Isoleucine
		Tryptophan
CGC	GCG	
CGT	GCA	
ATT		
AAA	UUU	
TTA		Asparagine
CCA		Glycine
TTT		

