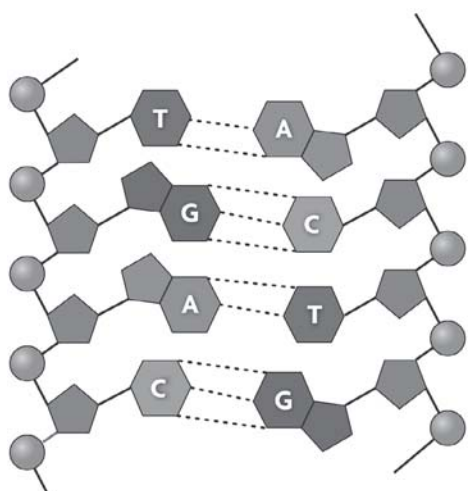


Genetics (Biotechnology)

5 The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells. As a basis for understanding this concept:



5.a *Students know* the general structures and functions of DNA, RNA, and protein.

5.b *Students know* how to apply base-pairing rules to explain precise copying of DNA during semiconservative replication and transcription of information from DNA into mRNA.

5.c *Students know* how genetic engineering (biotechnology) is used to produce novel biomedical and agricultural products.

5.d* *Students know* how basic DNA technology (restriction digestion by endonucleases, gel electrophoresis, ligation, and transformation) is used to construct recombinant DNA molecules.

5.e* *Students know* how exogenous DNA can be inserted into bacterial cells to alter their genetic makeup and support expression of new protein products.

WHAT IT MEANS TO YOU

From studying cancer to producing crops that are resistant to frost, biotechnology is an important part of our society. Biotechnology allows new genes to be added to an organism's DNA. As you can probably imagine, this technology poses some ethical questions. And as biotechnology continues to advance, you may be faced with some of these questions yourself.

STANDARD	CHAPTERS	PUPIL EDITION
5.a	8	226–233, 239–242
5.b	8	235–242
5.c	9	275–279
5.d*	9	264–267, 275–279
5.e*	9	275–279

SAMPLE QUESTIONS

1.



Which of the following identifies the processes shown in the flowchart above in the correct order?

5.a

- A replication, transcription, translation
- B transcription, translation, replication
- C replication, translation, transcription
- D translation, replication, transcription

2. G A A T C T

Given the DNA sequence shown here, what would be the sequence of the complementary mRNA strand?

5.b

- A C T T A G A
- B C U U A G A
- C C T T U G U
- D C U U A U A

Answers: 1a, 2b