AP BIO INSTA-REVIEW

TOPIC 1.6

Nucleic Acids

IST-1.A.1

DNA and RNA molecules have structural similarities and differences related to their function–

a. Both DNA and RNA have three components–sugar, a phosphate group, and a nitrogenous base–that form nucleotide units that are connected by covalent bonds to form a linear molecule with 5' and 3' ends, with the nitrogenous bases perpendicular to the sugar-phosphate backbone.

AP BIO INSTA-REVIEW

TOPIC 1.6

Nucleic Acids

IST-1.A.1

DNA and RNA molecules have structural similarities and differences related to their function–

b. The basic structural differences between DNA and RNA include the following:

i. DNA contains deoxyribose and RNA contains ribose.

ii. RNA contains uracil and DNA contains thymine.

iii. DNA is usually double stranded; RNA is usually single stranded.

iv. The two DNA strands in double-stranded DNA are antiparallel in directionality

AP BIO INSTA-REVIEW

TOPIC

1.6

What are the three components that make up a nucleotide?

AP BIO INSTA-REVIEW

TOPIC 1.6

What are the three components that make up a nucleotide?

> Pentose sugar

> Nitrogenous Base

> Phosphate

AP BIO INSTA-REVIEW

TOPIC

1.6

How are all of the components of a nucleotide oriented?

AP BIO INSTA-REVIEW

TOPIC 1.6

How are all of the components of a nucleotide oriented?

The pentose sugar has three sites that are important to binding:

1'- nitrogenous base
3'- hydroxyl (but this is a functional group on the pentose sugar not an additional component)
5'- phosphate

AP BIO INSTA-REVIEW

TOPIC

1.6

How does the pentose sugar differ between DNA and RNA?

A. DNA= deoxyribose, RNA= ribose

B. DNA= dextrose, RNA= ribose

C. DNA= deoxyribose, RNA= ribozyme

D. DNA= dextrose, RNA= ribozyme

AP BIO INSTA-REVIEW

TOPIC 1.6

How does the pentose sugar differ between DNA and RNA?

A. DNA= deoxyribose, RNA= ribose

DNA is deoxyribonucleic acid while RNA is ribonucleic acid. DNA has deoxyribose and RNA has ribose. The deoxyribose is missing an oxygen on the 2nd carbon of the sugar.

AP BIO INSTA-REVIEW

TOPIC 1.6

How does the nitrogenous base differ between DNA and RNA?

A. DNA - cytosine, RNA - guanine

B. DNA - uracil, RNA - thymine

C. DNA - guanine, RNA - cytosine

D. DNA - thymine, RNA - uracil

AP BIO INSTA-REVIEW

TOPIC 1.6

How does the nitrogenous base differ between DNA and RNA?

D. DNA - thymine, RNA - uracil

DNA has adenine, thymine, cytosine, & guanine.
RNA has adenine, uracil, cytosine, & guanine.

Adenine will pair with either thymine or uracil depending whether its DNA or RNA.
Test Tip: If you are asked for DNA and there are "U"s in the answer, you can cross those options out.

AP BIO INSTA-REVIEW

TOPIC

1.6

How does the phosphate differ between DNA and RNA?

A. DNA- 1 phosphate,
RNA- 2 phosphate

B. DNA- phosphate acts as acid,
RNA- phosphate acts as base

C. There is no difference

AP BIO INSTA-REVIEW

TOPIC 1.6

How does the phosphate differ between DNA and RNA?

C. There is no difference

All nucleotides have:

> pentose sugar (deoxyribose or ribose)

> nitrogenous base (adenine, thymine, uracil, cytosine, or guanine)

> phosphate

AP BIO INSTA-REVIEW

TOPIC

1.6

Traditionally, how are the strands different?

A. DNA - single, RNA - double

B. DNA - single, RNA - triple

C. DNA - double, RNA - single

D. DNA - triple, RNA - single

AP BIO INSTA-REVIEW

TOPIC 1.6

Traditionally, how are the strands different?

C. DNA - double,
RNA - single

DNA is a double stranded molecule with strands running antiparallel and bound by hydrogen bonds

mRNA is a single stranded molecule formed from base pairing with a split DNA strand.

AP BIO INSTA-REVIEW

TOPIC 1.6

Which nitrogenous base is not found in DNA?

A. Adenine

B. Cytosine

C. Thymine

D. Uracil

AP BIO INSTA-REVIEW

TOPIC 1.6

Which nitrogenous base is not found in DNA?

D. Uracil

DNA has adenine, thymine, cytosine and guanine.

There is no uracil. This is only found in RNA molecules.

AP BIO INSTA-REVIEW

TOPIC

1.6

What is the pentose sugar found in DNA?

A. Deoxyribose

B. Dextrose

C. Ribose

D. Rubisco

AP BIO INSTA-REVIEW

TOPIC 1.6

What is the pentose sugar found in DNA?

A. Deoxyribose

DNA stands for deoxyribonucleic acid and has the sugar deoxyribose. This is the same as the ribose, except it is missing an oxygen on the 2nd carbon in the pentose sugar.

AP BIO INSTA-REVIEW

TOPIC

1.6

What is the pentose sugar found in RNA?

A. Deoxyribose

B. Dextrose

C. Ribose

D. Rubisco

AP BIO INSTA-REVIEW

TOPIC 1.6

What is the pentose sugar found in RNA?

C. Ribose

RNA stands for ribonucleic acid and has the sugar ribose. This is the same as the deoxyribose, except it has an oxygen (specifically a hydroxyl group) on the 2nd carbon in the pentose sugar.

AP BIO INSTA-REVIEW

TOPIC

1.6

Which nitrogenous base is not found in RNA?

A. Adenine

B. Cytosine

C. Thymine

D. Uracil

AP BIO INSTA-REVIEW

TOPIC 1.6

Which nitrogenous base is not found in RNA?

C. Thymine

RNA has adenine, uracil, cytosine and guanine.

There is no thymine. This is only found in DNA molecules.

AP BIO INSTA-REVIEW

TOPIC

1.6

What is the directionality of a DNA strand?

A. DNA is 3' to 5' and antiparallel

B. DNA is 5' to 3' and antiparallel

C. DNA is 3' to 5' and parallel

D. DNA is 5' to 3' and parallel

AP BIO INSTA-REVIEW

TOPIC 1.6

What is the directionality of a DNA strand?

B. DNA is 5' to 3' and antiparallel

DNA is always synthesized in the 5' to 3' direction. The DNA polymerase responsible for synthesis of the DNA polymer can only add to an open 3' end thus it moves 5' to 3'. The two strands run in opposite directions equidistant apart (hence the antiparallel).

AP BIO INSTA-REVIEW

TOPIC

1.6

DNA is usually ___ and RNA is usually ___

A. Double stranded; double stranded

B. Double stranded; single stranded

C. Single stranded; double stranded

D. Single stranded; single stranded

AP BIO INSTA-REVIEW

TOPIC 1.6

DNA is usually ___ and RNA is usually ___

B. Double stranded; single stranded

DNA is a double stranded molecule with strands running antiparallel and bound by hydrogen bonds

mRNA is a single stranded molecule formed from base pairing with a split DNA strand.