1. A single nucleotide is made of:

   ☐ three bases

   ☐ two sugars and a base

   ☐ an amino acid and a phosphate

   ☐ a phosphate, a 5-carbon sugar and a base

2. DNA replication is ”semi-conservative” because each new molecule has:

   ☐ strands that mix old and new sections at random

   ☐ two original strands that have been repaired

   ☐ one original (old) strand and one newly made strand

   ☐ two brand-new strands made from free nucleotides

3. A gene is a sequence of DNA that codes for:

   ☐ one nucleotide

   ☐ one sugar

   ☐ one polypeptide

   ☐ the whole organism at once

4. A gene mutation is:

   ☐ a change in the number of cells

   ☐ a loss of all the DNA

   ☐ a change in the cell membrane

   ☐ a change in the base sequence of DNA

5. ATP releases energy for the cell when:

   ☐ a base is added

   ☐ it joins with DNA

   ☐ its last phosphate group is broken off

   ☐ its sugar changes to deoxyribose

6. In semi-conservative replication, each new DNA molecule keeps one of the original strands.

   ☐ True ☐ False

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_____

8. A substitution can sometimes leave the amino acid unchanged.

   ☐ True ☐ False

9. In DNA, A always pairs with T, and C always pairs with _____.

   _____

10. Free nucleotides line up against the exposed template bases by _____ base pairing.

    _____

1. **a phosphate, a 5-carbon sugar and a base**

   Every nucleotide has three parts: a phosphate group, a pentose sugar, and a nitrogen-containing base.

2. **one original (old) strand and one newly made strand**

   Each daughter molecule conserves one parental strand and pairs it with one new strand.

3. **one polypeptide**

   A gene is a length of DNA that codes for a single polypeptide.

4. **a change in the base sequence of DNA**

   A gene mutation is a change to the sequence of bases in a DNA molecule.

5. **its last phosphate group is broken off**

   ATP has three phosphates; breaking off the terminal phosphate releases energy.

6. **True**

   That is exactly what ”semi-conservative” means – one old strand is conserved in each copy.

7. **codon**

   Three bases = one codon (triplet); the matching three bases on a tRNA are its anticodon.

8. **True**

   Because the code is degenerate, the new triplet may still code for the same amino acid – no change.

9. **G**

   Complementary base pairing: A–T (2 hydrogen bonds) and C–G (3 hydrogen bonds).

10. **complementary**

    Each template base attracts its complement (A–T, C–G), so the new strand is an exact partner.

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