

Making Sentences of DNA

Summary

In this activity students will model protein synthesis using sentences for DNA/RNA codes and words for amino acids. They will transcribe and translate the DNA into a sentence.

Time Frame

1 class periods of 60 minutes each

Group Size

Small Groups

Materials

- [Anti-Codon Cards](#)
(attached) These will be taped to the wall around your room.
- [DNA template cards](#)
(attached) These will be kept on your desk (the "nucleus") at all times. After all, DNA cannot leave the nucleus.
- [student worksheet](#)
(attached)
paper: to write down the mRNA strand and the tRNA molecules and the sentence.
pen / pencil

Instructional Procedures

Make up all the DNA Template Cards and the Anti-codon/word cards--See below for instructions.

Hang up the Anti-codon word cards, so the anti-codons are showing.

Show the student the cards and tell them what they are.

Tell the students that your desk is the nucleus and the DNA templates cannot leave the area.

A student is to pick up a DNA template card, write down the DNA template card number, and transcribe it into mRNA.

With the mRNA sequence, s/he will go back to the group's desk and the ribosomal student will write out the tRNA anti-codon sequence.

The tRNA student will search out the correct anti-codon card and flip the card over revealing the word. S/he will write down the word.

After completing the sentence, a student in the group will tell you his/her group sentence. If not correct, have the group go over the same DNA template. If correct, have the students pick another card. To make a contest, see which group can do the most sentences.

Note:

Students may work alone or in groups (it is better to assign one student to be the mRNA, another student to write down the anticodons (ribosome) and the third student to search out the proper words (tRNA). Every sentence must have a start (ATG) and a stop (TAG) codon.

Keys for making cards:

*Key to tRNA Cards with Words (Note: write the anticodon on one side of the card, and write the word on the other):

UAG = Stop (period) CCG = is CGC = water

AUG = Initiator (Start) CCU = subject CGG = every

AAA = Your CGA = drink CGU = day

AAC = mother . . . AAG = wears . . . AAU = dresses
 ACG = funny . . . ACC = have . . . ACU = dog
 ACA = breath . . . AGA = the . . . AGG = are
 AGU = Beatles . . . AGC = best . . . AUA = rock
 AUC = band . . . AUU = an . . . CAA = old
 CAC = rubber . . . CAG = breaks . . . CAU = pulled
 CCA = when . . . CCC = Biology . . . CUA = I
 CUC = love . . . CUG = roll . . . CUU = music
 GAA = all . . . GAC = demented . . . GAG = puppies
 GAU = and . . . GCA = so . . . GCC = much
 GCG = fun . . . GCU = education . . . GGA = door
 GGC = to . . . GGG = future . . . GGU = father
 GUA = a . . . GUC = dress . . . GUG = brother
 GUU = nothing . . . UAA = we . . . UAC = in
 UAU = this . . . UCA = together . . . UCC = must
 UCG = be . . . UCU = informed . . . UGA = around
 UGC = you . . . UGG = read . . . UGU = little
 UUA = DNA . . . UUC = code . . . UUG = for
 UUU = life

Key to DNA Fragments: (Write these sequences on cards.)

ATGAAAAACAAGGTACACATCTAG
 ATGAAAAACAATTGCACGTAG
 ATGTAAACCACTACATAG
 ATGAGAAGTAGGAGAAGCATAATCTAG
 ATGATTCAACACATCCAGCCACATTAG
 ATGCCCCCGAGAAGCCCTTAG
 ATGCGACGCCGGCGTTAG
 ATGCTACTCATAGATCTGCTTTAG
 ATGTAAAGGGAAGACGAGTAG
 ATGCCCCCGGCAGCCGCGTAG
 ATGGCTCCGAGAGGAGGCAGAGGGTAG
 ATGAAAGGTAAGGTAGTCTAG
 ATGAAAGTGAAGGTTTAG
 ATGTAAAGGGAATACTATTCATAG
 ATGTAATCCTCGTCTCGGCGTTAG
 ATGATAGATCTGCTTCCGAGAAGCTAG
 ATGCCCCCGGAATGATGCTAG
 ATGTGGGTATGTCGGCGTTAG
 ATGTTACCGAGATTCTTGTTTTAG
 ATGTTATCCTCGTGGTTGTTTTAG

Key for the sentences: *20 Sentences:

Your mother wears a rubber band.
 Your mother dresses you funny.
 We have dog breath.
 The Beatles are the best rock band.
 An old rubber band breaks when pulled.
 Biology is the best subject.
 Drink water every day.
 I love rock and roll music.

We are all demented puppies.
Biology is so much fun.
Education is the door to the future.
Your father wears a dress.
Your brother wears nothing.
We are all in this together.
We must be informed every day.
Rock and roll music is the best.
Biology is all around you.
Read a little every day.
DNA is the code of life.
DNA must be read for life.

Assessment Plan

Scoring Guide:

1. Students complete at least 5 sentences correctly.....4
2. Student answer analysis questions correctly.....4

Answers:

Answers will vary.

A mutation

DNA carries genetic information from individual to individual and codes rRNA , mRNA carries

DNA code to ribosome to code tRNA, tRNA line correct amino acids up to form protein molecules.

Bibliography

Lesson Design by Jordan School District Teachers and Staff.

Authors

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