Mechanisms of Genetics

Interesting Items ▶

Which subclusters will we choose for review?	What are common errors and misconceptions we can help students avoid?	Which items will we use?
Components of DNA Readiness: B.6(A) Supporting: B.6(B)	• not understanding the significance of nitrogenous base sequencing in determining organism traits • not understanding that nucleotides only have one base pairing • not understanding the double helix structure of DNA • not understanding the components of DNA as being different among organisms, but the building blocks are the same • thinking that a lack of energy can change the translation of proteins	B.6(A) 2023 item 32 B.6(A) 2019 item 23 B.6(A) 2018 item 24 B.6(A) 2017 item 51 B.6(A) 2015 item 24 B.6(B) 2017 item 18 B.6(B) 2014 item 19
Transcription and Translation Supporting: B.6(C), B.6(D)	• not understanding when to use DNA and RNA base pairs • not understanding the location of where transcription and translation occur • thinking that you should use the tRNA strand to read a codon chart instead of using the mRNA strand • thinking that genes can be regulated by factors such as temperature • not understanding that any traits (e.g., coat color) that change due to environmental factors are controlled by gene expression, not DNA mutations • thinking that gene expression can cause cells to perform specialized activities • thinking that genes in an embryo's DNA can be deleted	B.6(C) 2021 item 27 B.6(C) 2017 item 44 B.6(C) 2016 item 17 B.6(C) 2015 item 10 B.6(D) 2023 item 41 B.6(D) 2018 item 16
Mutations Readiness: B.6(E)	• not associating mutations with changes at the chromosomal level in gametes • not identifying changes in a new DNA segment that results from a mutation • misinterpreting the effects of a mutation on a codon chart • not understanding how to transcribe DNA triplets when mutations have occurred • not understanding how to identify a type of mutation and understanding if that mutation is helpful for genetic variation or harmful to the organism's survival	B.6(E) 2023 item 19 B.6(E) 2022 item 5 B.6(E) 2018 item 52 B.6(E) 2016 item 35 B.6(E) 2013 item 21
Genetic Variation Readiness: B.6(F) Supporting: B.6(G)	• not understanding the construction of monohybrid and dihybrid crosses • not understanding how to calculate percentages and ratios for traits from a Punnett square • not understanding how to determine the genotype that generated physical traits when presented with the phenotype of offspring • not understanding how to create a cross when specific genotypic letters are not provided for the traits • confusing genetic diagrams associated with meiosis and the stages of meiosis • not associating cross-over with creating genetic variation • not understanding how to construct and interpret a Punnett Square when alleles are described	B.6(F) 2023 item 10 B.6(F) 2019 item 26 B.6(F) 2018 item 29 B.6(F) 2017 item 6 B.6(F) 2017 item 29 B.6(G) 2021 item 48 B.6(G) 2018 item 32 B.6(G) 2017 item 39

Which stimuli will we emphasize?

Investigation	Demonstration	Graph*	Chart/Table*	Diagram*	Visual/Image/ Illustration*	Web/Cycle/ Chain	Model*	Informational Text/List*	Map	Formula/ Equation

Which words will we prioritize?

adenine*	codon mRNA*	dominance*	genetic material*	hydrogen bond(ing)*	meiosis	non-Mendelian inheritance	recessive (trait)*
allele*	complementary strand*	dominant trait	genetic sequence*	incomplete dominance	Mendel's laws of inheritance	offspring*	sex cell
amino acid*	crossing over*	double helix*	genetic variety*	independent assortment	monohybrid cross	phenotype*	thymine*
anticodon*	cytosine*	gamete	genotype*	inherited trait	mRNA codon*	phosphate*	trait*
base sequence*	dihybrid cross*	gene expression*	guanine*	inherited*	nitrogen bases	polypeptide chain	transcription*
chromatid*	diploid*	gene mutation*	haploid*	law of independent assortment	nitrogenous base*	principle of dominance	translation*
chromosomal mutation	DNA (deoxyribonucleic acid)*	gene*	heterozygous*		non-disjunction	protein*	tRNA*
chromosome*	DNA codon*	genetic change*	homology*	law of segregation	nucleotide*	Punnett square*	uracil
codominance	DNA triplet*	genetic code*	homozygous*				variation*

Have we prepared students to respond to different item types?

Multipart (2 pts)	Multiselect (2 pts)	Short Constructed Response (2 pts)	Text Entry (1-2 pts)	Hot Spot (1-2 pts)	Drag and Drop (1-2 pts)	Multiple Choice (1 pt)