

Lesson	Main Learning Goal	Focus Question	Science Content Storyline
	nucleotides that codes for a specific protein is called a gene.	that can do its job in the cell?	(code) for assembling amino acids into a specific protein.
5	An intermediate molecule, mRNA, transfers the DNA code for amino acid sequence from the nucleus to the cytoplasm where the protein is made.	How does the information in a DNA sequence found in the nucleus get to the cytoplasm where proteins are made?	DNA, and its code for the amino acid sequence of proteins, is contained in the nucleus of cells. However, proteins are made outside the nucleus in the cytoplasm of cells. RNA is an intermediate molecule that allows DNA to stay protected in the nucleus and proteins to be made in the cytoplasm.
6	The combination of genes that an organism has comes from its parents. These genes determine the version of the trait an organism displays.	Why do two parents sometimes have children that have the same version of a trait as they do and sometimes have children with a different version of the trait?	The fur color of a jaguar is determined by the combination of alleles (different forms of a gene) it receives from its parents. An offspring can be heterozygous or homozygous for a trait. Some alleles seem to be more influential for a trait because they are dominant.
7	DNA is packaged into chromosomes, which allows for new genetic combinations and variation through meiosis.	If individuals have the same version of one trait, will they also have the same version of other traits?	Alleles for a trait are passed from parents to offspring on chromosomes. Although an individual jaguar can be homozygous or heterozygous for a trait, such as fur color, it inherits different alleles in different patterns for other traits. This is possible because jaguars have multiple chromosomes that are sorted independently during meiosis.
8	An individual's traits are determined by the combination of genes they receive from their parents that code for a specific amino acid sequence to make a protein with a specific function.	How can multiple offspring of the same parents can have different versions of the same trait?	In meiosis, chromosome pairs are separated in the production of eggs and sperm. Chromosomes are then recombined through sexual reproduction. An individual's traits are the result of proteins coded for by the combination of genes they receive from their parents.
9	Using information about parental alleles, inheritance, and proteins in cells it is possible to make predictions about the traits of family members.	Is it possible for a family who all show the same version of a trait to have an individual with a different version of the trait? If so, how did that happen? If not, why not?	Pedigrees are a tool that can help analyze the traits of a family. Information from both classical and molecular genetics as well as tools such as pedigrees, provides evidence to explain how variation in a population's traits arise.