

Discovering the Genome: Bioinformatics: What? Why? Who? Module – For Teachers

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Module <i>(Estimated time to cover module sections)</i>	Where can I cover this in my Biology curriculum? Highlights?	Next Generation Science Standards	Other Resources <i>(Websites, related activities, etc.)</i>
<p>Bioinformatics:</p> <p>What? Why?</p> <p>Who?</p> <p><i>Video plus discussion - 20min</i></p> <p><i>45-50 min for all activities that follow (they can be done in 5-15 minute chunks)</i></p>	<p>Introductory video could be used in a DNA Technologies unit. The same is true for all of the activities that follow in this section.</p> <p>Please note that the last problem in the “Real Problems” section renews itself with a different problem when you reload the page!</p>	<p>ETS1.B: Developing Possible Solutions *When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. *Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of purposes, such as running simulations to test different ways of solving a problem or to see which one is most efficient or economical; and in making a persuasive presentation to a client about how a given design will meet his or her needs.</p> <p>HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.</p> <p>LS1.A: Structure and Function *All cells contain genetic information in the form of DNA molecules. *Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1)</p>	

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		<p>HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.</p> <p>HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors</p> <p>LS1.A: Structure and Function *All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins.</p> <p>HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.</p> <p>LS4.A: Evidence of Common Ancestry and Diversity *Genetic information provides evidence of evolution. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence. (HS-LS4-1)</p>	
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