

366810

DNA Structure and Protein Synthesis Lab Activity

Aligned With All Published National Standards



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standards alignment

framework for K-12 science education © 2012

* The Dimension I practices listed below are called out as **bold** words throughout the activity.

DIMENSION 1 Science and Engineering Practices	X	Asking questions (for science) and defining problems (for engineering)		Use mathematics and computational thinking
	X	Developing and using models	X	Constructing explanations (for science) and designing solutions (for engineering)
	X	Planning and carrying out investigations	X	Engaging in argument from evidence
	X	Analyzing and interpreting data	X	Obtaining, evaluating, and communicating information
DIMENSION 2 Cross Cutting Concepts	X	Patterns		Energy and matter: Flows, cycles, and conservation
		Cause and effect: Mechanism and explanation	X	Structure and function
		Scale, proportion, and quantity		Stability and change
		Systems and system models		
DIMENSION 3 Core Concepts	Discipline		Core Idea Focus	
	Physical Science		PS1: Matter and Its Interactions	
	Life Science		LS1: From Molecules to Organisms: Structures and Processes	

X Indicates standards covered in activity

next generation science standards © 2013

Middle School Standards Covered	High School Standards Covered
MS.PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.	HS.LS1-1: Construct an explanation based on evidence on how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

(continued on next page)

standards/learning objectives

national science education standards © 1996

Content Standards (K-12)			
×	Systems, order, and organization		Evolution and equilibrium
×	Evidence, models, and explanation	×	Form and Function
	Constancy, change, and measurement		
Life Science Standards Middle School		Physical Science Standards High School	
×	Structure and Function in Living System	×	Structure and Properties of Matter

× Indicates standards covered in activity

benchmarks for science literacy (AAAS, © 1993)

1. The Nature of Science	1B: Scientific Inquiry
4. The Physical Setting	4D: Structure of Matter
5. The Living Environment	5C: Cells
11.Common Themes	11A. Systems
	11B. Models

activity objectives:

- Visualize DNA and RNA by constructing molecular models.
- Understand the roles of DNA, mRNA, and tRNA in the process of protein synthesis.
- Simulate replication, transcription, and translation through model manipulation.
- Correlate mRNA codons to specific amino acids.

time requirement:

45 minutes