



Unwinding the Complexities of the Central Dogma

The Flow of Genetic Information



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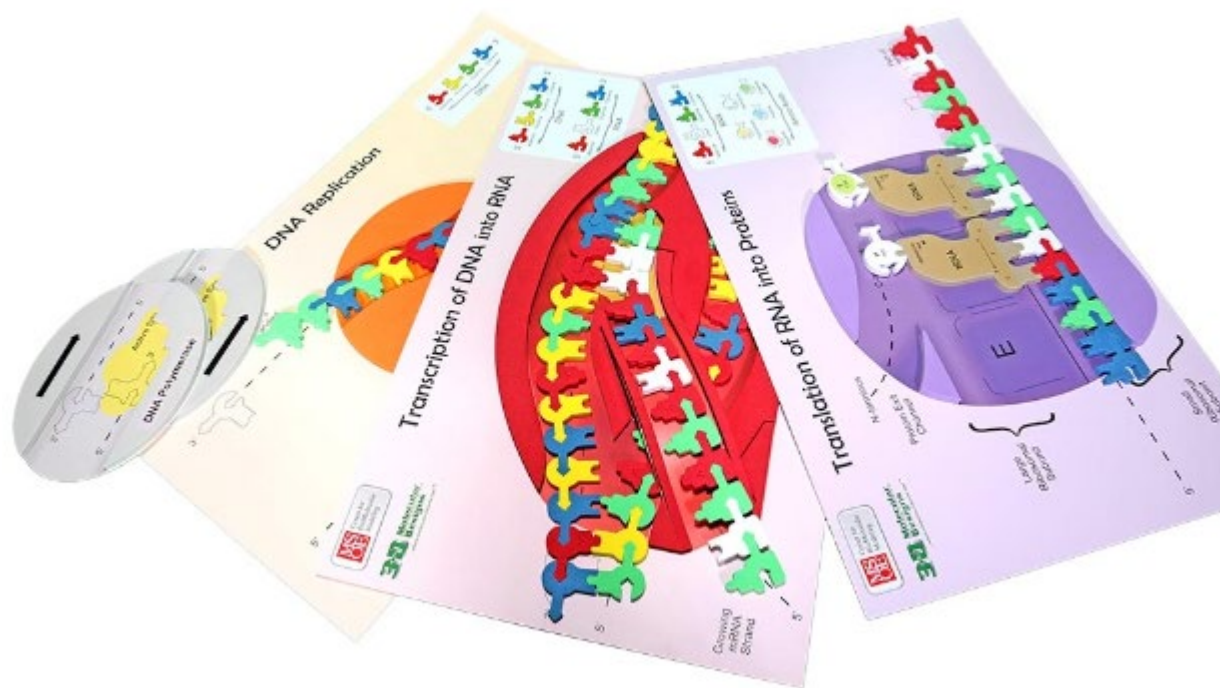
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Workshop Learning Goals

1. What makes a good model?
2. What can we learn from the Flow of Genetic Information Kit?
3. What do you find difficult when you are teaching about 'the central dogma'?
4. Where do multidimensional models help with this topic?
5. How can you show DNA Synthesis, Transcription and Translation?

The Central Dogma

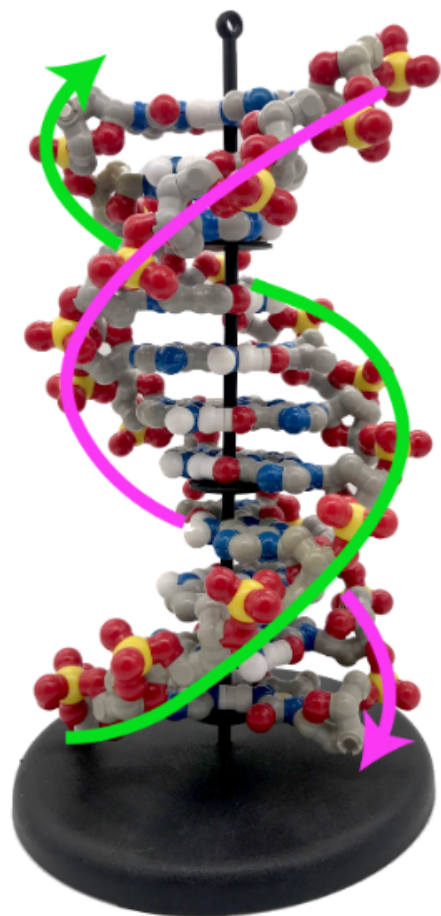
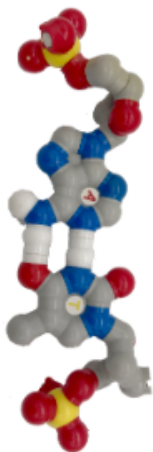


A Note on DNA Directionality

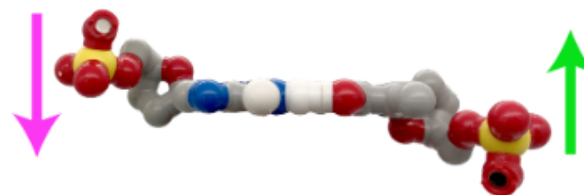
The two strands of nucleotides that make up a DNA double helix are often referred to as **antiparallel**, meaning that they go in opposite directions. This can be seen in schematic representations of DNA base pairs, such as the graphic to the right.



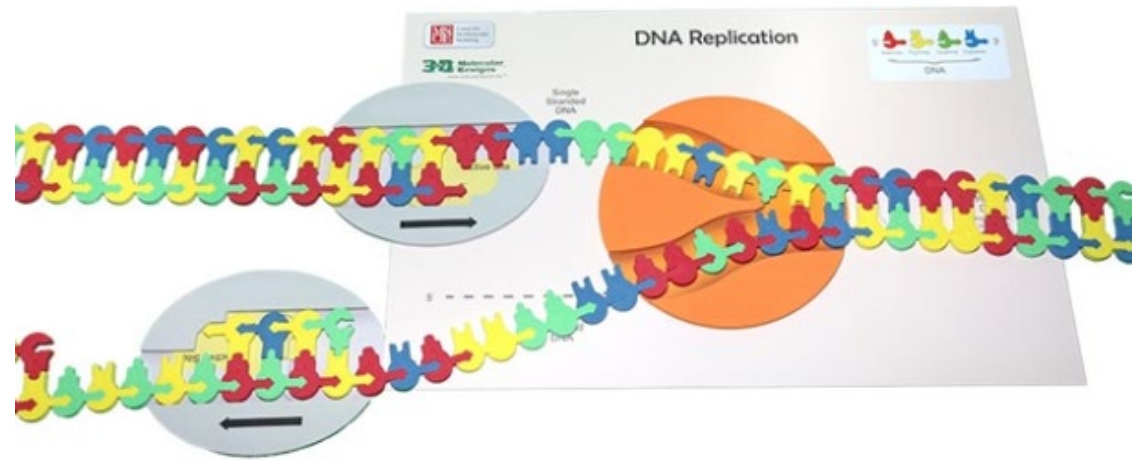
However, it is a bit harder to see this directionality when looking at atom-based representations of DNA base pairs, such as the graphic to the right. At first glance, the backbone regions appear to be going in the same direction!



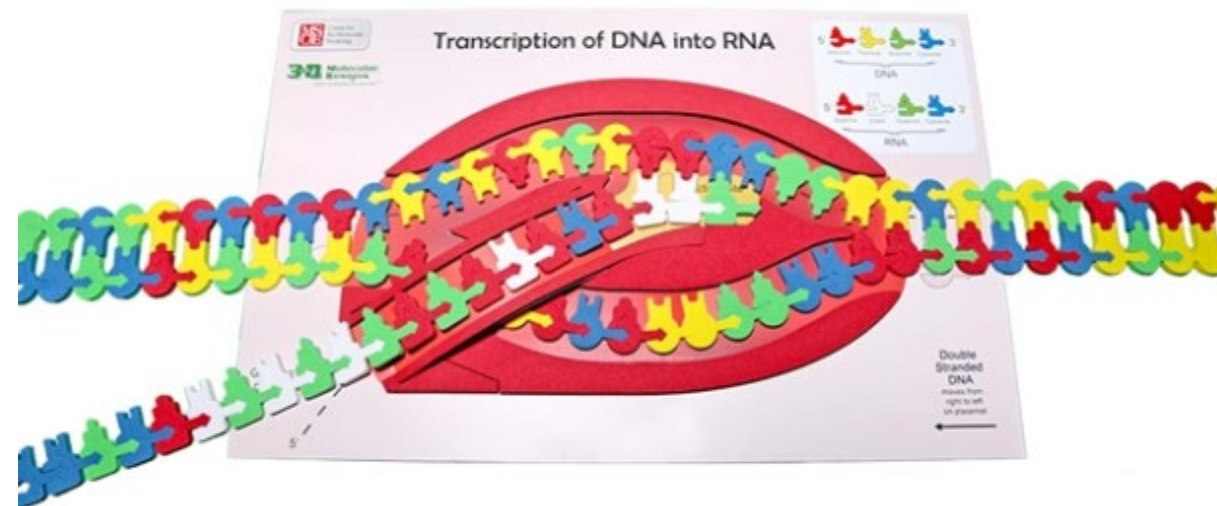
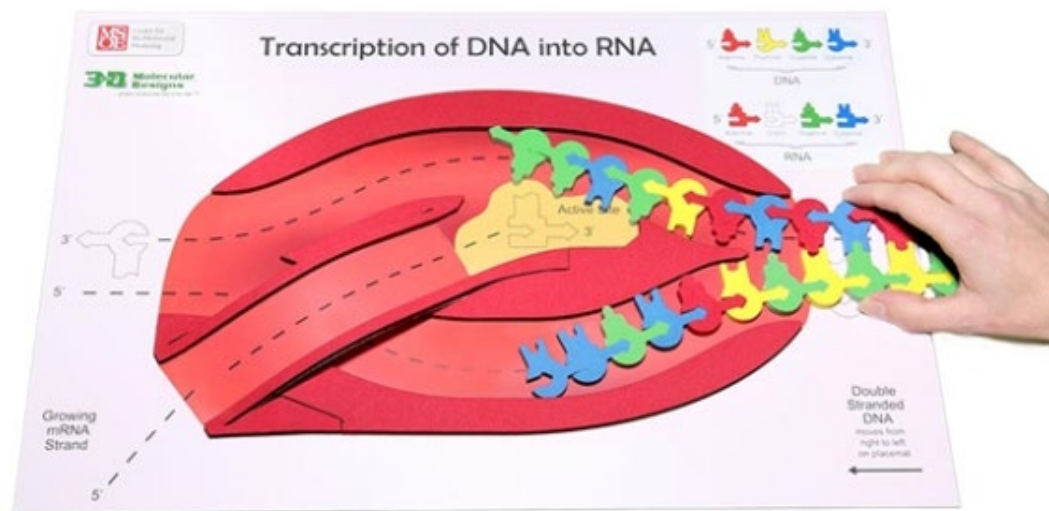
This is because real DNA exists in 3-dimensions, and so it is difficult to capture all of its attributes in a single 2-dimensional image. The direction of the strands can be more easily seen by viewing a DNA base pair from the side, rather than from the top.



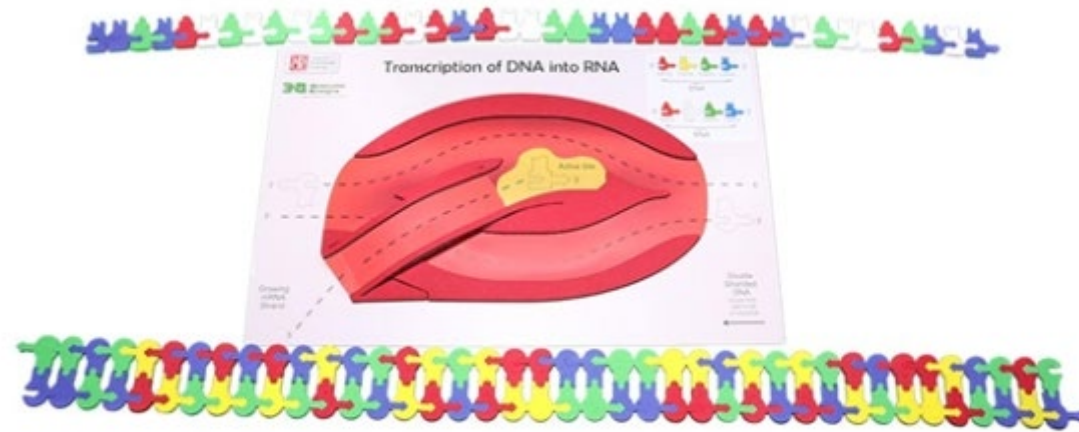
DNA Replication



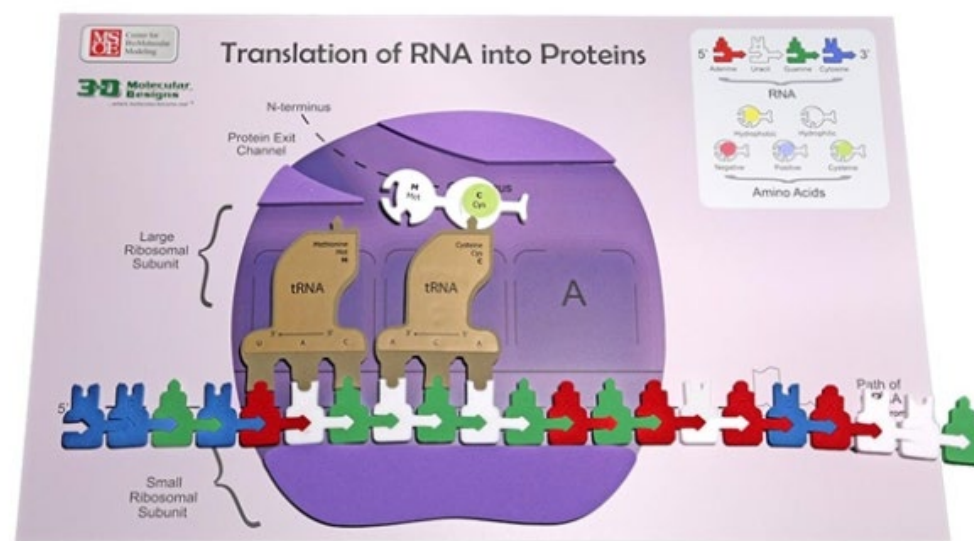
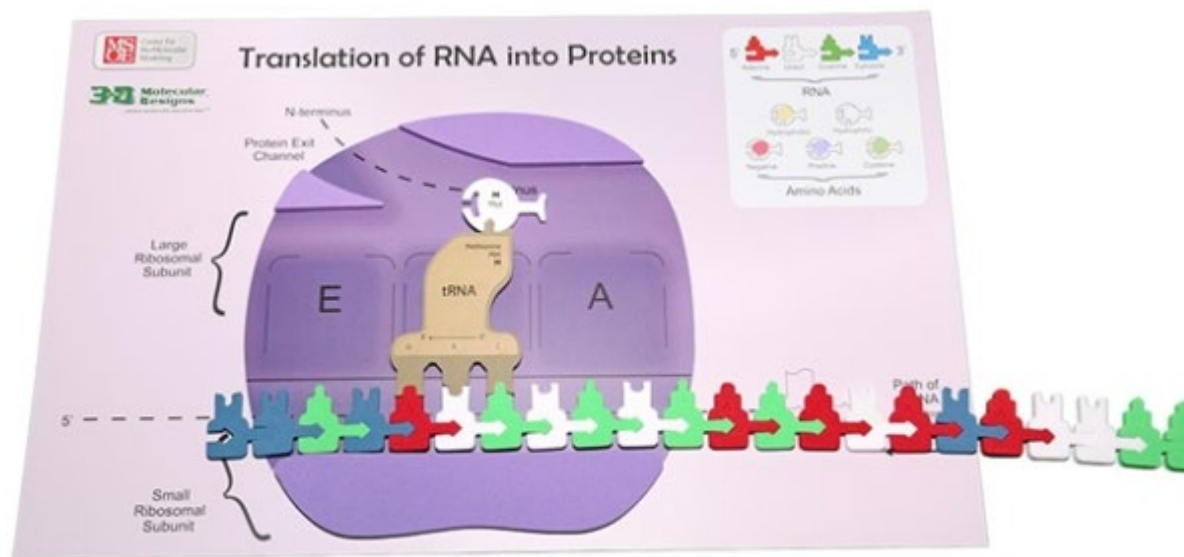
Transcription

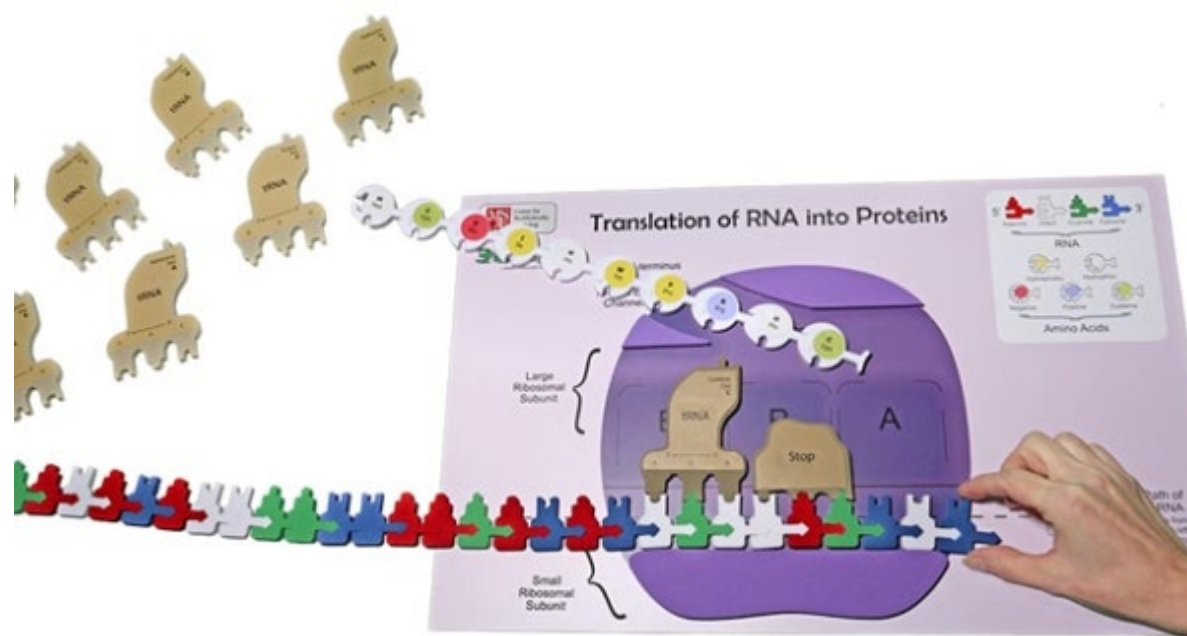


Model Enhancements?



Translation





Workshop NGSS Connections (and/or other applicable standards)

SEPs	CCCs	DCIs
Asking Questions and Defining Problems	Patterns	LS1.A: Structure and Function
Developing and Using Models	Cause and Effect: Mechanism and Explanation	
Constructing Explanations and Designing Solutions	Scale, Proportion, and Quantity	
Engaging in Argument from Evidence	Structure and Function	
Analyzing and Interpreting Data	Stability and Change	

Thank you!

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Transforming Science Learning

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