Operon Model Assignment

Task: Create a functional model of a trp or lac operon of a prokaryotic cell. You will be using pool noodles to represent the DNA strand and duct tape with additional materials to label the parts of the operon. Your group will then present your functioning operon to another group.

	Points Possible	Points Earned – Peer Review	Points Earned
Structure:			
- Regulatory Gene – can include the actual name	6		
- Promoter	6		
- Operator	6		
- Structural Genes – labeled with correct names OR number the genes	6 6		
- Regulatory (repressor) protein	6		
- Tryptophan or Allolactose	6		
- RNA Polymerase	6		
Function: Trp Operon			
- Low trp densities:			
o Shows RNA polymerase (6pts) doing transcription (4pts) and describes that the proteins made are used to make tryptophan (8pts)	18		
o Has the regulatory protein in the inactive form	6		
- High trp densities:			
o Tryptophan binds to the inactive regulatory protein (8pts) and activates the protein (4pts)	12		
o Tryptophan described as a corepressor	6		
o Activated protein gets attached to the operator	8		
o RNA polymerase can no longer do transcription	8		
Lac Operon			
- Low lac densities:			
o Shows RNA polymerase (6pts) blocked from doing transcription (4pts) with the active regulatory protein in the operator (8pts)	18		
- High lac densities:			
o Allolactose binds to the active regulatory protein (8pts) and inactivates the protein by pulling it off the operator (4pts) OR binds to the regulatory protein (8pts) that prevents it from binding to the protein (4pts)	12		
o Has the regulatory in the inactive form	6		
o Allolactose described as an inducer	6		
o Shows RNA polymerase doing transcription (8pts) and describes that the proteins made are used to breakdown lactose (8pts)	16		
Total	100		

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Function:
Be able to show how the operon function in low and high densities of tryptophan or lactose

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