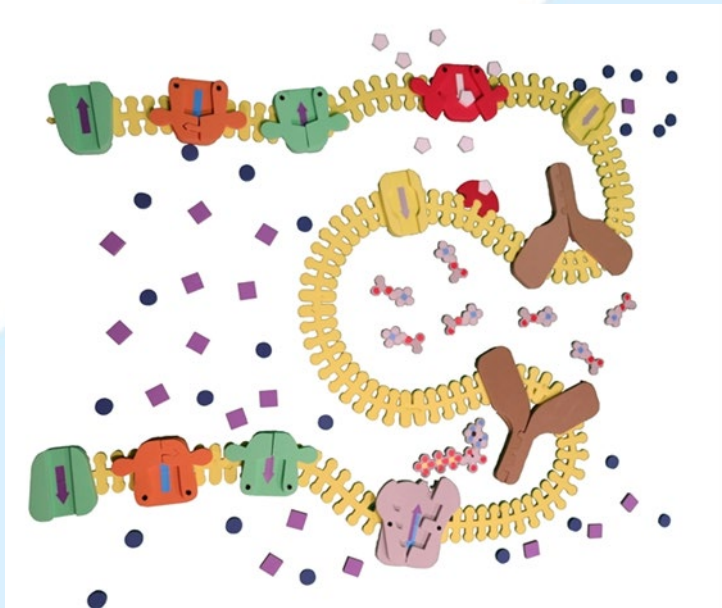




When Cells Talk

Things Happen

The Synapse Construction Kit



Dan Williams

BS, MA Biology

High School Teacher

NYS Master Teacher

Biology SAR - STANYS Suffolk



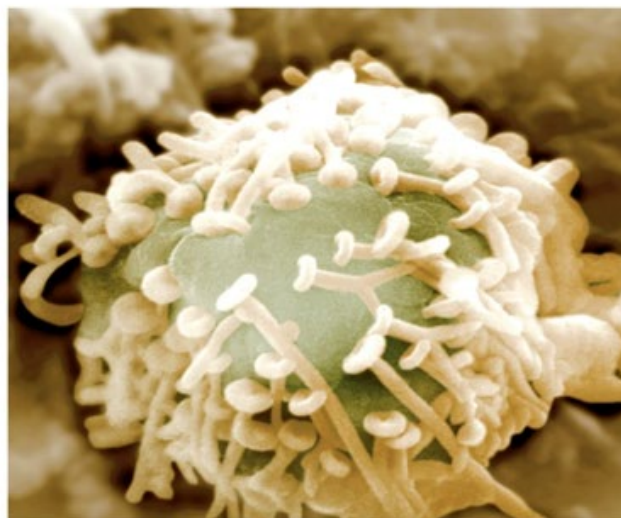
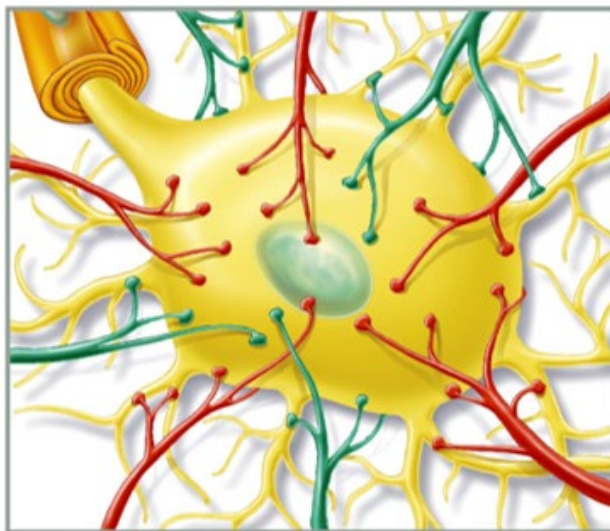
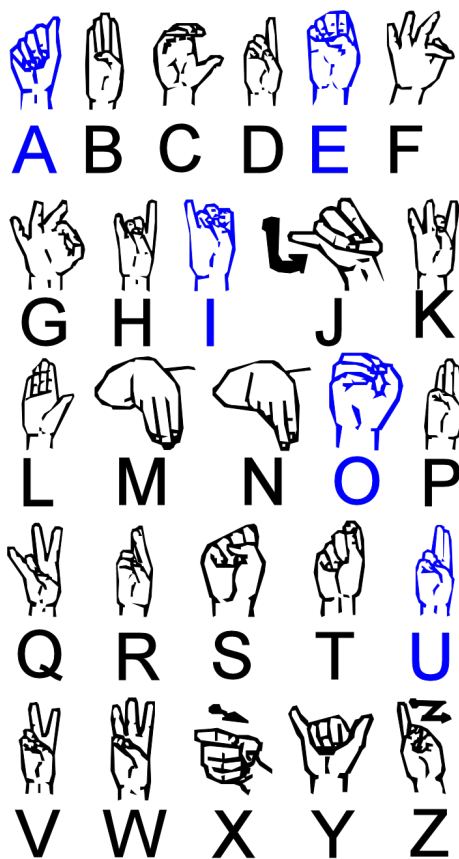
Dan.Williams@shelterisland.k12.ny.us

@Willida25

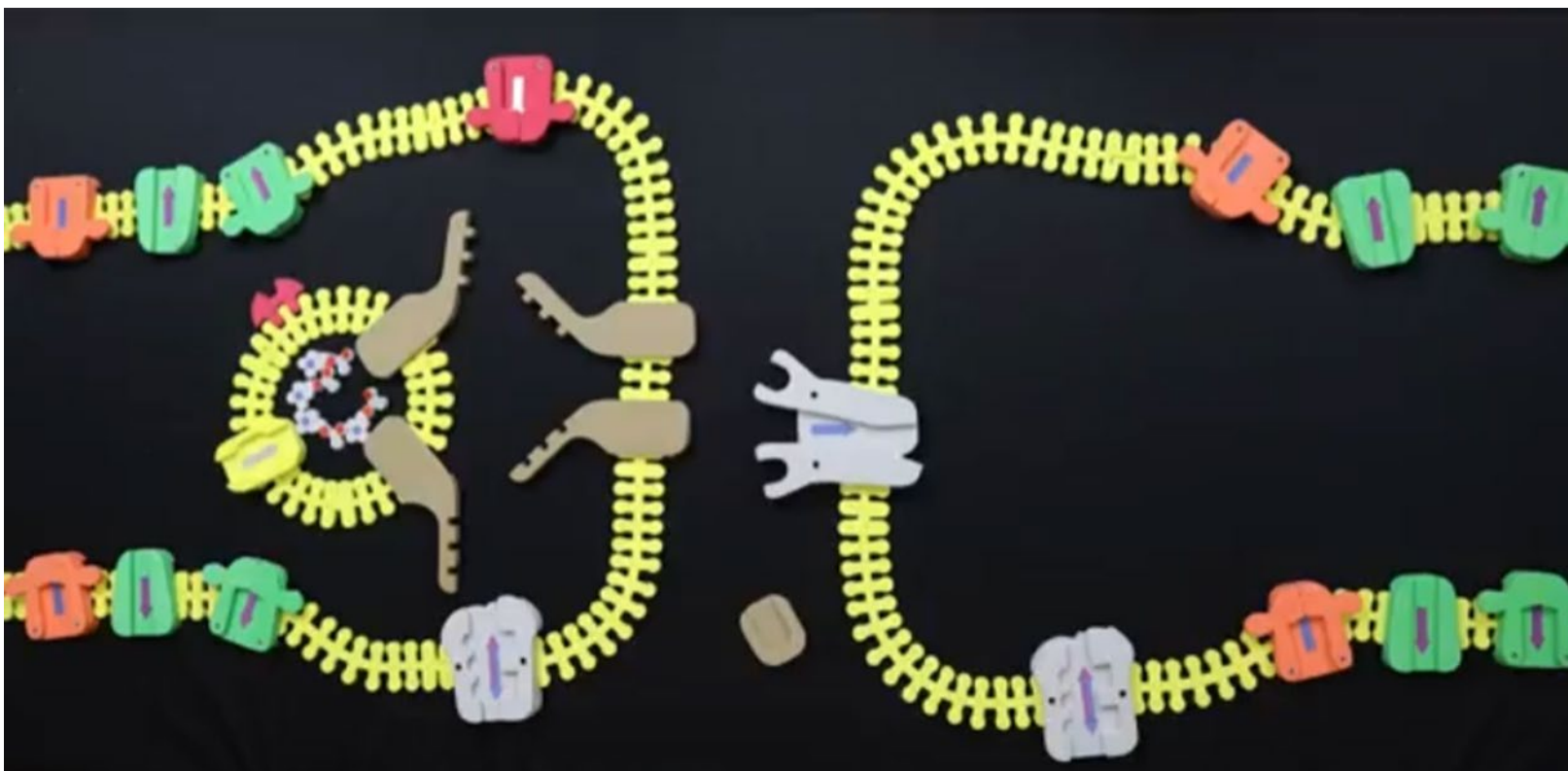


Workshop Learning Goals

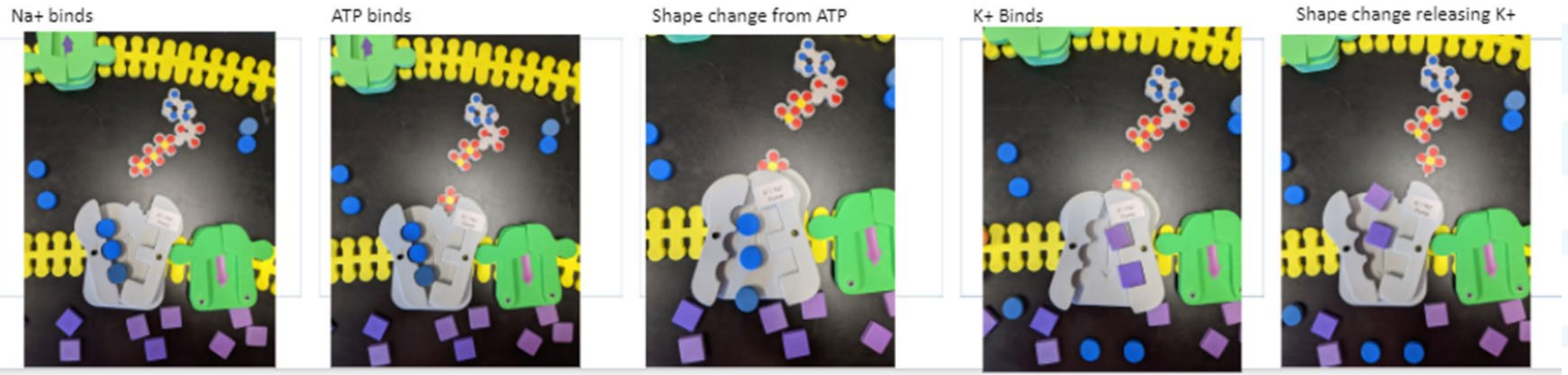
1. What makes a good model?
2. What can we learn from the synapse model?
3. What do you find difficult when you are teaching about cell interactions?
4. Where do multidimensional models help with this topic?
5. How can you show cell communication, synapses, disruptions of communication between cells and signal transduction using this model?



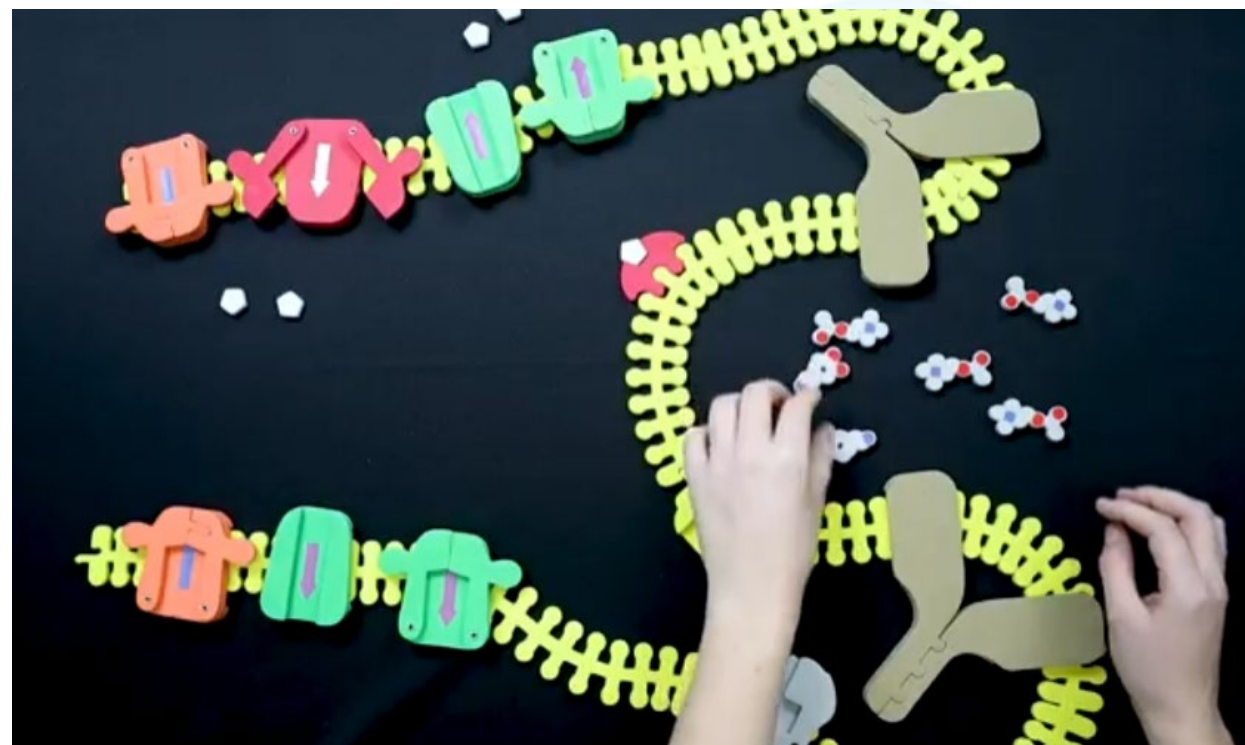
Synapse Kit -Overview



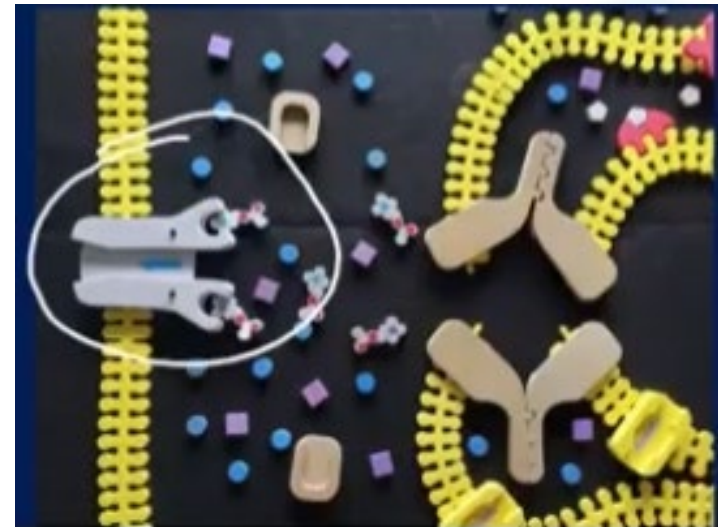
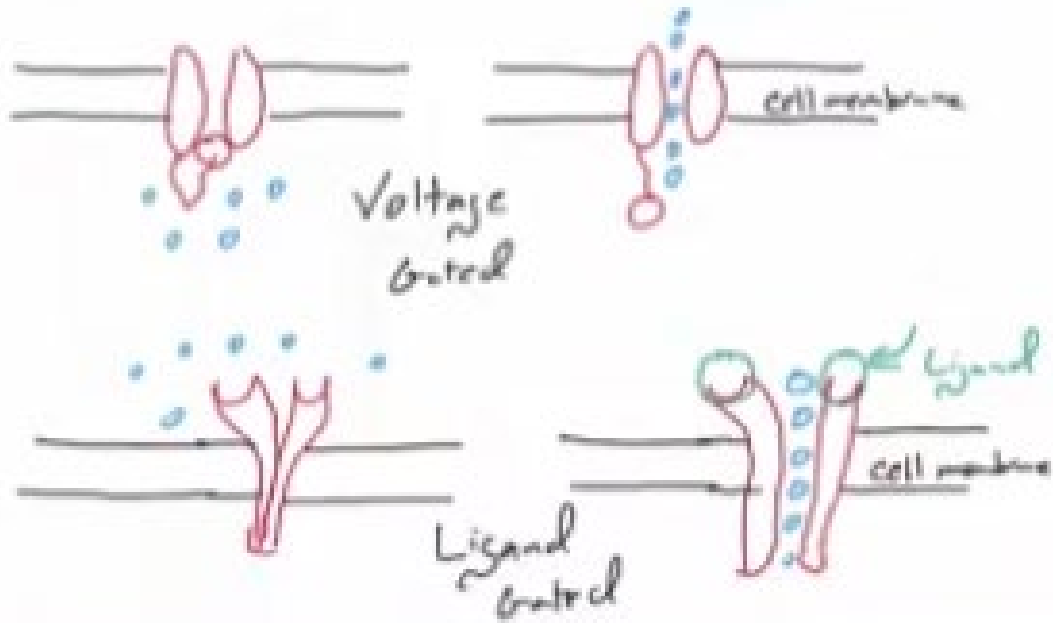
Na⁺/K⁺ Pump –the best ATP Mediated shape change model example!



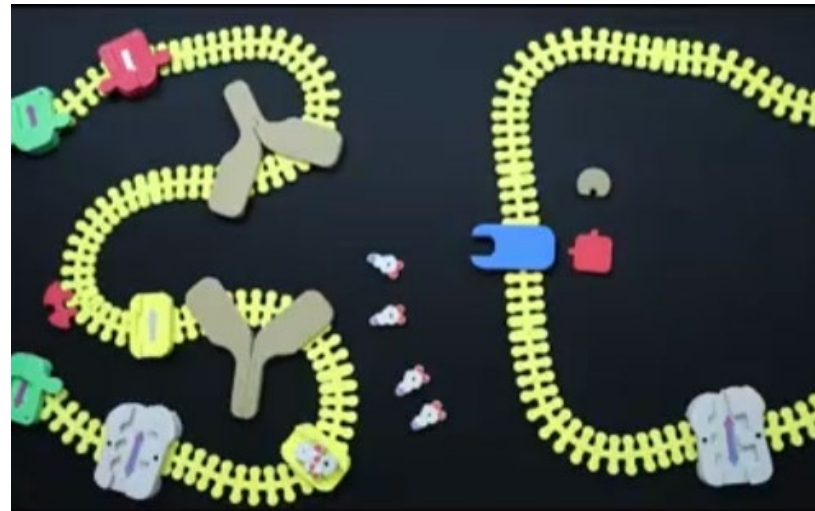
Cell to Cell Communication –Pre Synapse



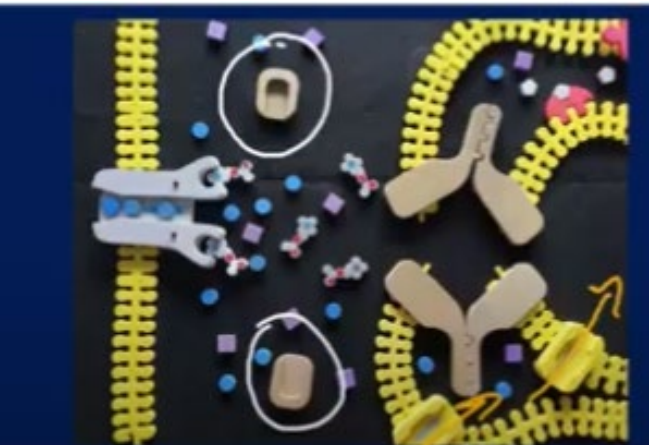
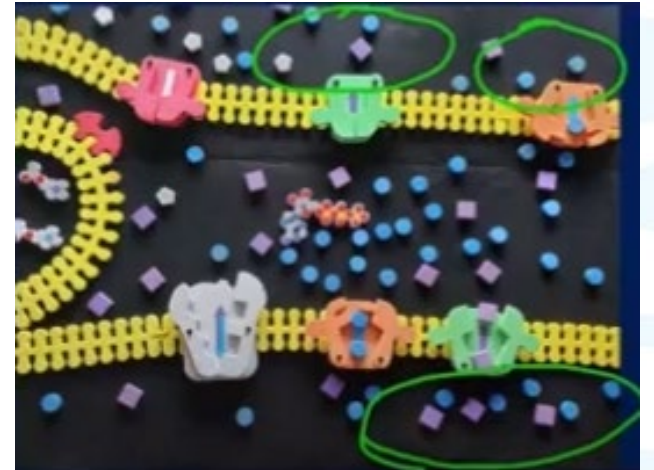
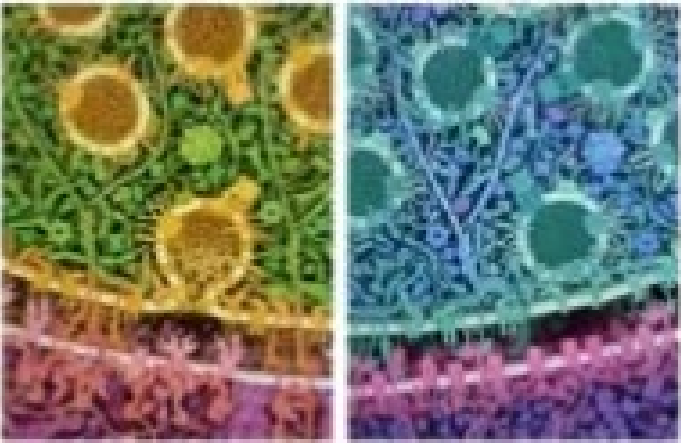
Voltage vs. Ligand Gated – Post Synapse



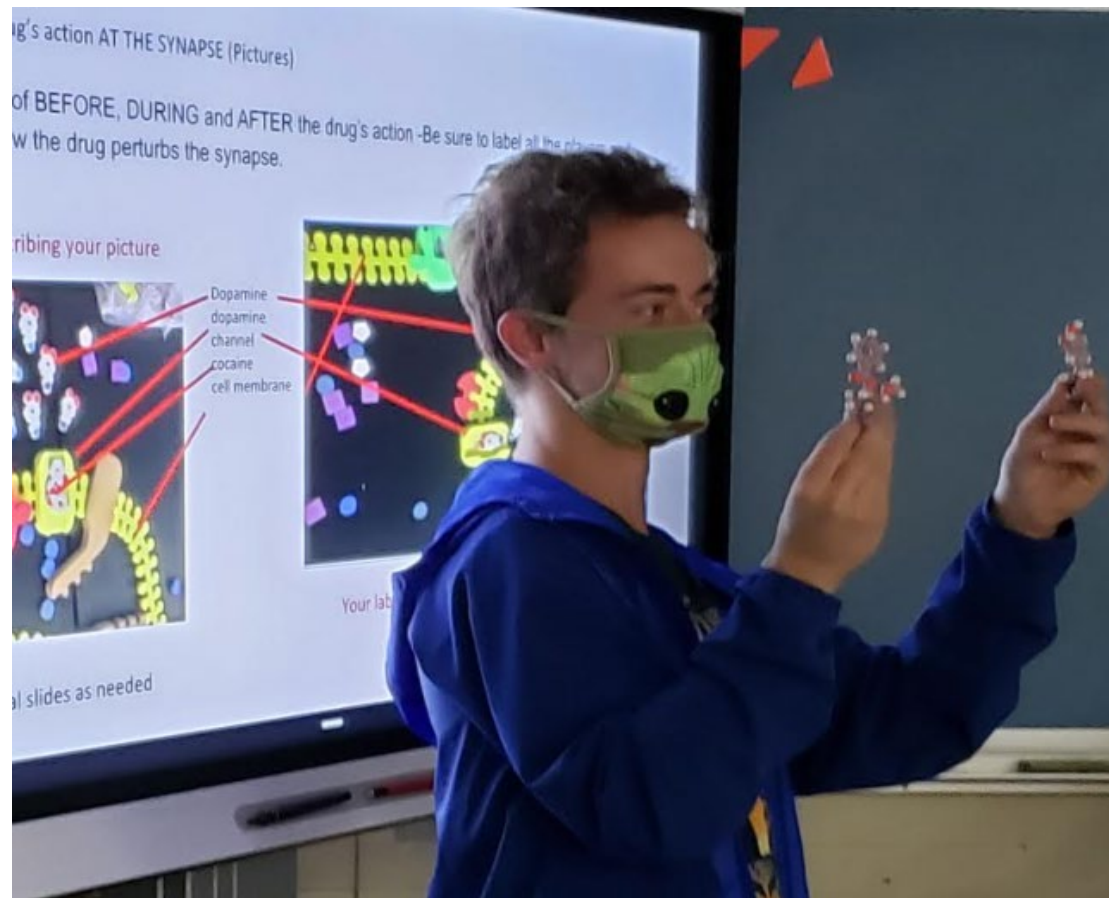
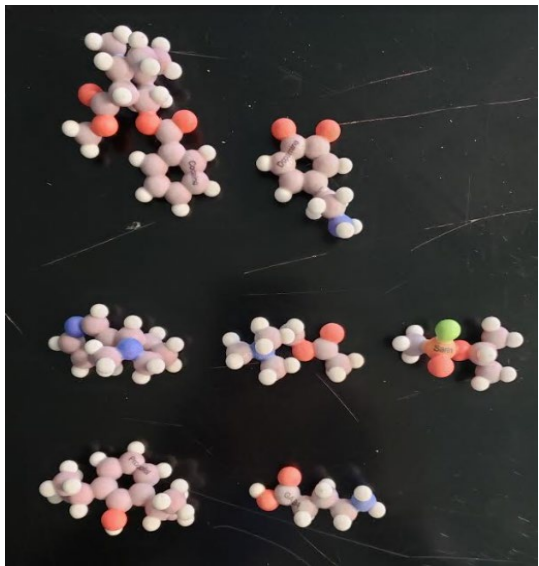
Messing up the Synapse



Student Questions



Making Claims



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!

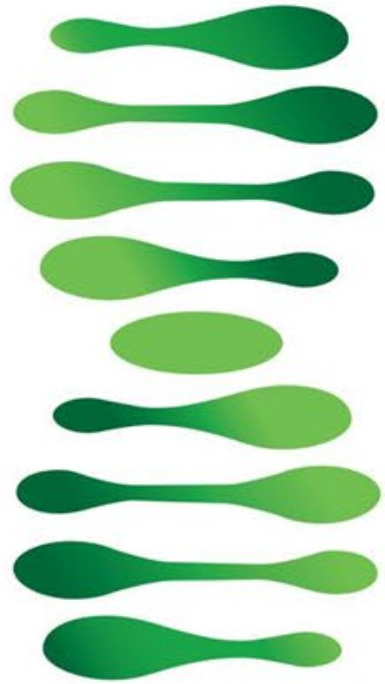
Visit us at booth 1600

Transforming Science Learning

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