

# SAPA

Science As Performing Arts

with David Hanley

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Modalities &  
Anticipatory  
Sets

To Enhance Science  
Literacy





# Marzano & other modalities

## Marzano's 9 Instructional Strategies

- 1 Identifying similarities and differences
- 2 Summarizing and note taking
- 3 Reinforcing effort and providing recognition
- 4 Homework and practice
- 5 Non-linguistic representations
- 6 Cooperative learning
- 7 Setting objectives and providing feedback
- 8 Generating and testing hypotheses
- 9 Cues, questions, and advance organizers

- ♦ But let us not forget: Simulation, Re-Enactment, Analogies, Inter/Intra Group Cooperation/Competition (Johnson, Johnson, & a few more Johnsons)





# Discrepant Events, Demos, & Performances

- ◆ Combining these activities, with different modalities, as performances, will greatly empower the teaching of any subject literacy.





EXAMPLES



# ANALOGIES

- ◆ Analogy In Lieu Of Truth is a fallacy, but a professional teacher would be crippled without the “tool” of “Analogy”.
- ◆ Siphon
- ◆ Cells; cytoplasm, cell membrane, ribosomes, etc.
  - ◆ FB - davidrealdave8
- ◆ Vaccines
- ◆ Newspaper Growing Sprout/Tree



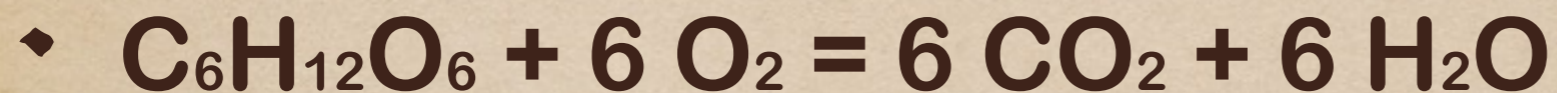
# Cell Stuff

- ◆ Cytoplasm = colloid
- ◆ Ribosomes = protein (paperclip)  
manufacturing
- ◆ (time allowing) Cell Membrane - pores

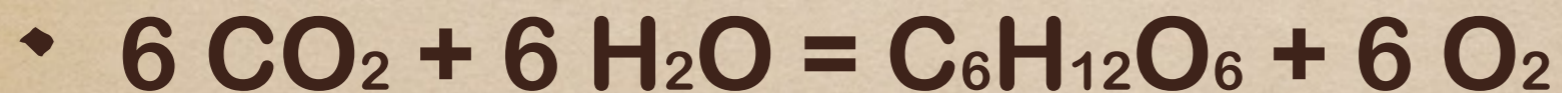


# Newspaper Growing Sprout/Tree

- ♦ **Respiration**



- ♦ **Photosynthesis**





# Siphon

- ◆ Darwin Awards Honorable Mention
- ◆ 50 Gallon Trout Tank
- ◆ Beads Simulation



# Vaccíne

- ◆ Vacca = Cow; -íne = ooze
- ◆ CD = DNA/RNA; Case = Protein Coat
- ◆ Microwave CD = Attenuated DNA/RNA



# Story Telling

- ◆ 3 Greatest Science Discoveries - Topic Introduction
- ◆ Marie & Pierre Curie, Mendel, Mendeleev, Lister, Roentgen, Jenner, Churchill/Flemming,



# Re-Enactment

- ◆ Tommy Torso Assembly
- ◆ County Council Zoning Meeting
- ◆ Space Herpes Description
- ◆ Leaf River Inventory



# Tommy Torso

- ◆ Simulating surgery





# County Council Meeting



- ◆ Save the Kit Fox
- ◆ Assign council members, conservationists, developers, city planners, community citizens, etc.
- ◆ Stage the classroom



# Space Herpes

Planeria





# Leaf River

Do a compost survey.

clip boards, hand lenses, classification keys, gloves, forceps, survey sheets, etc.



# Compare/Contrast

- ◆ Julius Erving Hand
- ◆ “I am more like a loaf of bread than an earthworm/snail.”



# Scale

- ◆ “3 Equal Length Ropes”
- ◆ Circle Glider - Experiment w/ size
- ◆ Newton's Cradle



# Concept Transference

- ◆ Objects at rest... balance hanger, "teacher at risk", apple & knife
- ◆ Candle burn, Ditto master;  
Convection....PLUS , PHASES OF MATTER



# But By All Means Perform

- ◆ Yes, there are plenty of Youtube videos out there; But you are real, and your students prefer REAL.
- ◆ We may not be major scientists. We may not be practiced performers. We may even question our skills at teaching.
- ◆ BUT IF WE PERFORM, OUR STUDENTS WILL THINK THAT WE ARE THE BEST SCIENCE TEACHERS THEY EVER HAD.