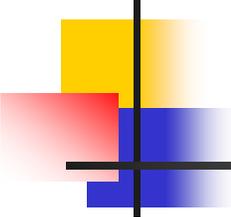


# Make it-Take it-Teach it

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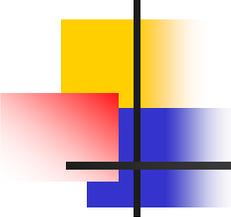
Diane Riendeau  
Deerfield High School  
[driendeau@dist113.org](mailto:driendeau@dist113.org)



# What is it?

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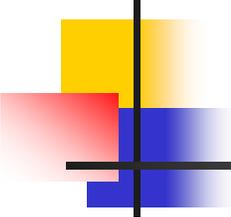
- “Everything Old is New Again!”
- 3 step process to...
  - Increase student comprehension
  - Increase student interest/enthusiasm
  - Increase parental involvement/interest



# Why Make It?

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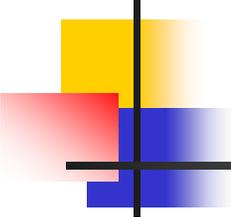
- Ownership
- Reaches creative/kinesthetic students
  - “Learning is not a spectator sport.”
- Show the practical nature of concept
- So they CAN take it home



# Why Take It?

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- Extends physics beyond the classroom
- Creates interest with others
- Encourages physics conversation
- What am I going to do with them?

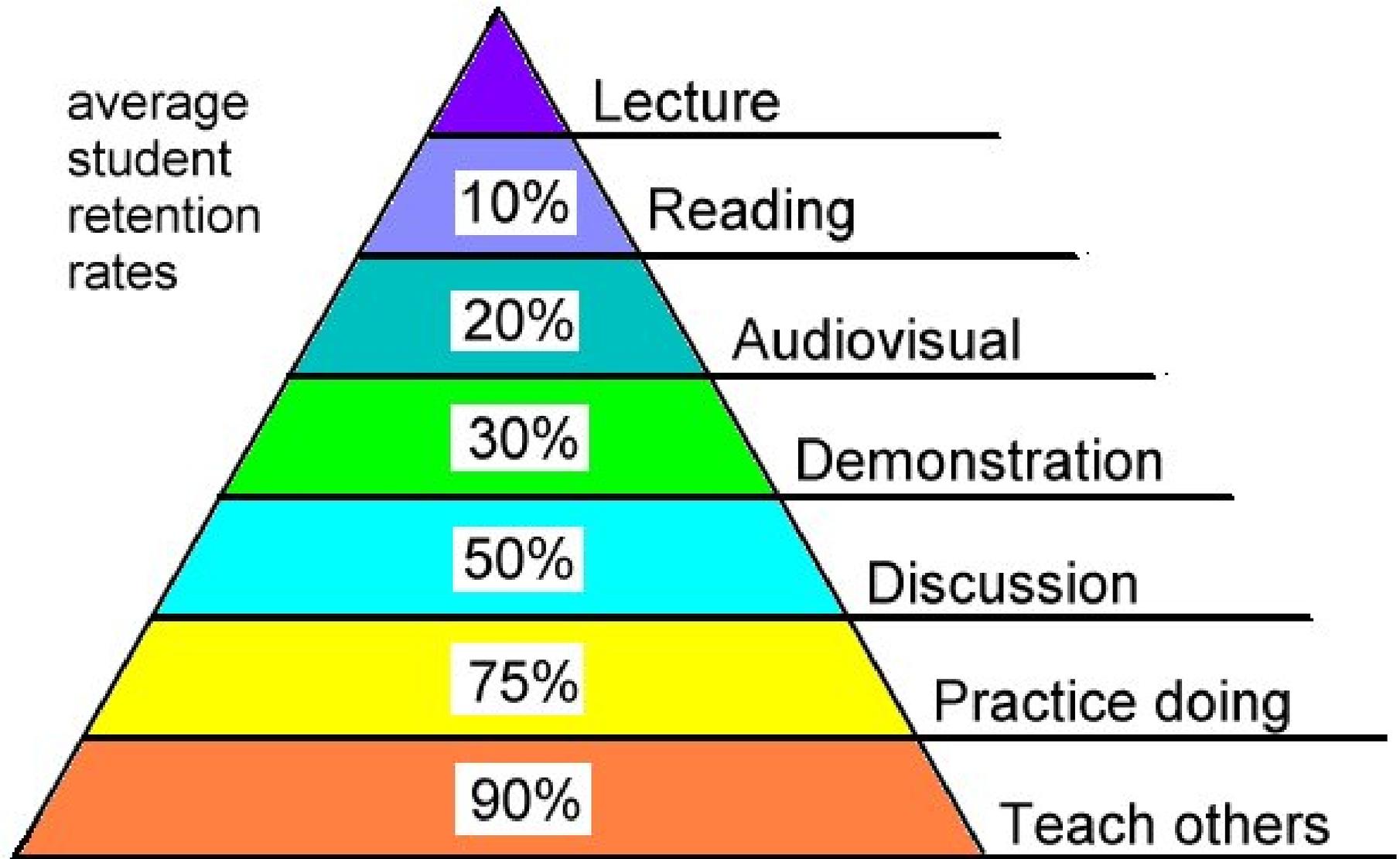


# Why Teach It?

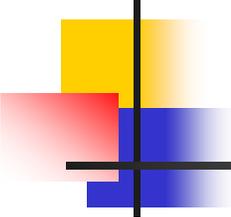
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- “To teach is to learn twice.” Joseph Joubert
- Encourages parent/student interaction
- Gets parents on your side/invested
- Encourages parental monitoring

# Learning Pyramid



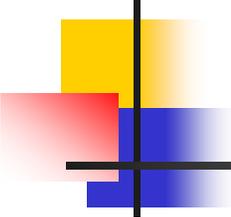
Source: National Training Laboratories, Bethel, Maine



# Examples

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- Resonance
  - “Mind over Matter” Pendulum
- Sound
  - Stadium Horn
- Reflection
  - Kaleidoscope
- Refraction
  - Gel candles
- Light
  - CD spectroscope
- Electrostatics
  - Electrophorus
- Inertia
  - CD air puck



# What Goes Home?

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- **Questions for the student**

- 1. Rate your understanding of lightning now    1        2        3        4        5
- 2. Rate the final product you made            1        2        3        4        5

- **Questions for the parent/adult to fill out**

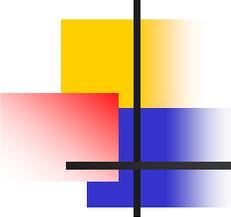
- 1. How do clouds become charged?
- 2. How come the air doesn't ground the cloud?
- 3. What substance forms the conductive path between the ground and cloud?
- 4. Rate how well your student explained this to you    1    2    3    4    5
- 5. Rate your perception of the usefulness of this        1    2    3    4    5
- teaching technique
- 6. Rate the students enthusiasm for this assignment    1    2    3    4    5

- Signature \_\_\_\_\_

- Comments: \_\_\_\_\_

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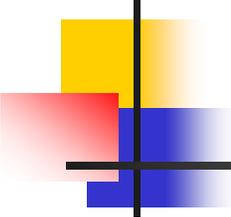
- *(1-awful        2- poor        3-average    4-very good        5-excellent)*



# Let's Do Some!!

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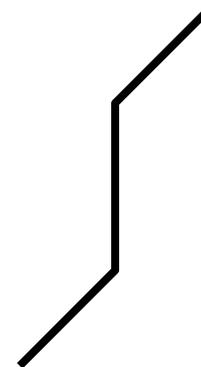
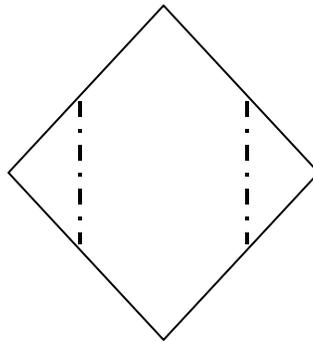
- You should have received a bag full of equipment when you came in. We will be using this equipment now.



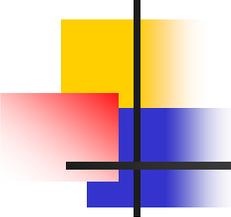
# Color Combining Turbine

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- Take the small black square out of the bag
- Bend the corners of the square. Bend one forward toward you and the other away from you.



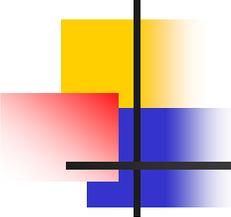
Top view



# Color Combining Turbine

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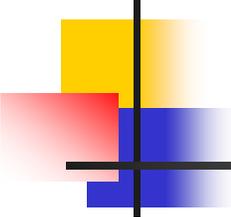
- Put a red dot on one side in the center of the square and a red dot on the other side.
- Hold the square by the unbent points and blow into the bent corners. The paper should spin.
- What color do you see when it is spinning?



# Permanent Oil Slick

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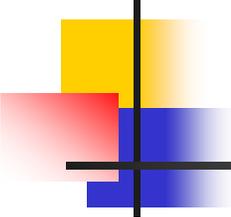
- Take out the larger black piece of poster board. It should have a pretty “oil slick” on it.
- Explain to your neighbor why there appear to be many different colors



# Permanent Oil Slick

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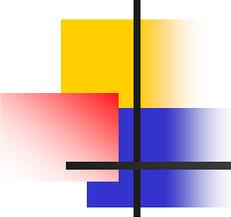
- The reason has to do with interference of waves. The light passes into the “slick.” Some of the light reflects while some passes into the “slick.” When the light that passed through hits the other side of the slick, it is also reflected. As a result, there are 2 reflected waves coming back toward you.



# Permanent Oil Slick

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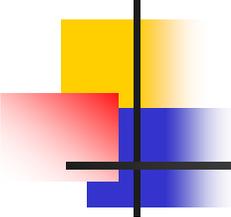
- These reflected waves interfere. Depending on the thickness of the “slick,” different wavelengths (colors) of light will add constructively (we’ll see them) or destructively (we will not see them).
- For example, if you see magenta, then blue and red add constructively and green adds destructively!



# Stadium Horns

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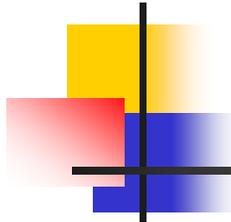
- Please pull out the prepared film canister, the piece of PVC pipe and a piece of plastic.
- Place the plastic over the opening of the canister and secure with the lid.
- Carefully place the PVC pipe into the hole in the bottom of the canister and adjust it until it is close to (but not touching) the plastic



# Stadium Horns

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- Blow into the hole on the side of the canister. You may need to adjust the location of the pipe to get the horn to sound.
- Try to change the pitch played by covering/opening the holes in the pipe.

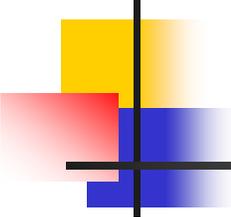


# Flipsticks

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- Sometimes, we cannot make a suitable item. During these units, I will purchase a toy for the students.
- Take out the flipstick and play with it for a moment.
- What topics in Physics does this illustrate?

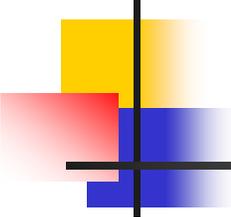




# Parent Quotes

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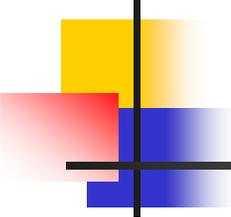
- “Understanding is reinforced in an enthusiastic way”
- “I’m glad Allyssa brought home an experiment”
- “When she was confused she used her notes”



# Parent Quotes

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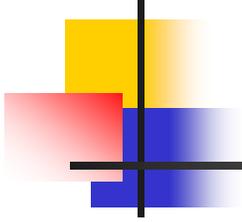
- “It was nice to have a topic of conversation about everyday science and how it effects our daily lives”
- “Great way to internalize information”



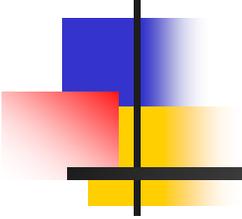
# Acknowledgements...

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- Chris Chiaverina & Jim Hicks
- My DHS and BHS encouragers
- Physics Northwest Crew
- American Association for the Advancement of Science
- Shanghai Association for Science and Technology



謝謝



# Make it-Take it-Teach it

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<http://www.arborsci.com/CoolStuff/Archives.htm>