

1. Learners remember everything. They simply cannot retrieve some information at certain times.
2. Physical education improves learner performance in mathematics and literacy.
3. Offering learners the opportunity to struggle leads to better learning.
4. Completing a significant amount of reading, note-taking, and problems leads to better learning.

To better **understand** how my **students engage** in learning and the implications on my teaching.

Success Criteria

- I can explain key principles of how my students learn.
- I can create learning opportunities for my students that integrate these principles into my school and classroom.


We remember what we **encode**.



Tractor	Ocean
Green	Nicely
Apple	Countertop
Zero	Airplane
Weather	Jump
Pastel	Laugh
Quickly	Tall

#1	#2
<p>Complete the following:</p> $1 + 5 = ?$ $2 + 4 = ?$ $3 + 3 = ?$ $4 + 2 = ?$ $5 + 1 = ?$	<ol style="list-style-type: none"> Choose any number between 2 and 9. Add it to itself and record your answer. Then, increase your chosen number by one and decrease your chosen number by one. Add the two resulting numbers. What do you notice?

Hattie, Fisher, and Frey, 2017

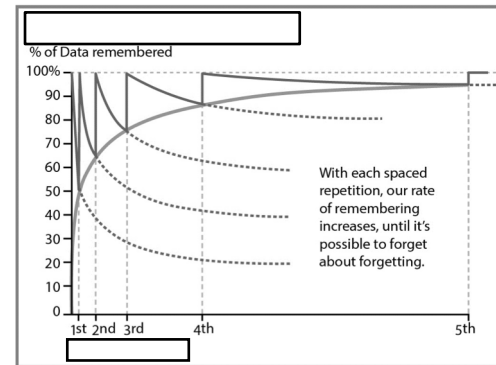
#1	#2
<p>Order the following fractions by first finding a common denominator.</p> $19/15$ $11/15$ $7/12$ $41/30$ $5/6$ $1/2$	<ol style="list-style-type: none"> Predict where you think $11/8$ should be on the below number line. Explain why you placed $11/8$ where you did. Draw and label a few other points to help you explain your reasoning. 

	<h2 style="text-align: center;">Representation Patterns Emotion</h2> <p style="text-align: right; font-size: small;">Median, 2008</p>
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Retrieval Practice/Testing Effect
<ol style="list-style-type: none"> Instead of repeated restu_____g, learners are far better off tes_____g themselves, both early and often (Roediger & Karpicke, 2006). The act of retr_____l is a memory modi____r. Whatever infor_____n is retr_____d becomes strengthened (Bjork, 1975). With fee_____k, either by seeing the answers or rev_____g the information, the benefits of tes_____g become even more powerful (Hayes et al., 2010; Pashler et al., 2005). For mult_____e – ch_____e questions, have students justify why a particular answer is cor_____t and why other answers are incor_____t (Chan et al., 2006; Little et al., 2012). When material is studied over sev_____l sess_____s and tested in a new context, var_____g the contexts of study results in be_____r perf_____ce (Smith et al., 1978; Smith & Vela, 2001).



The Spacing Effect



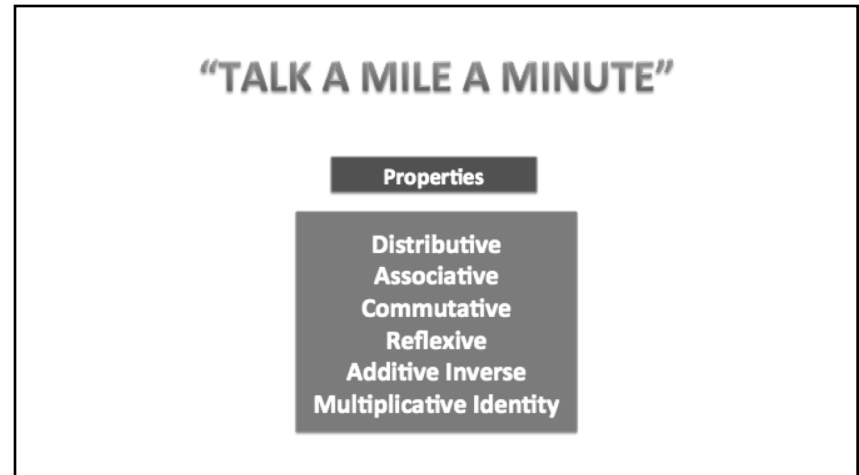
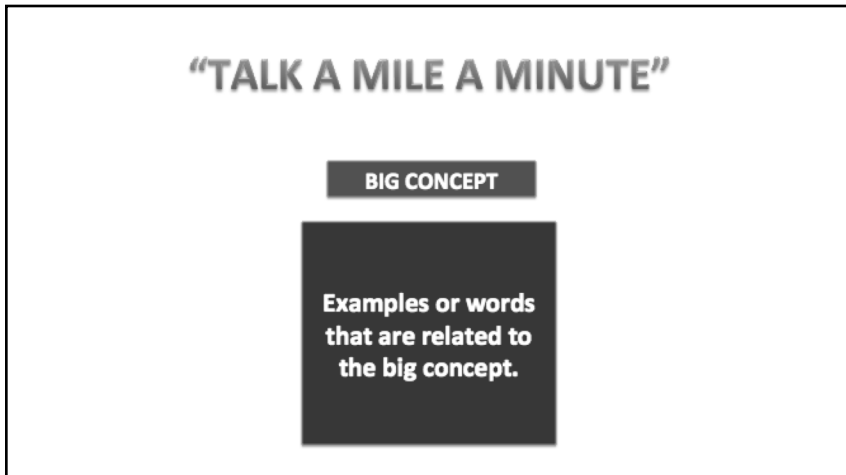
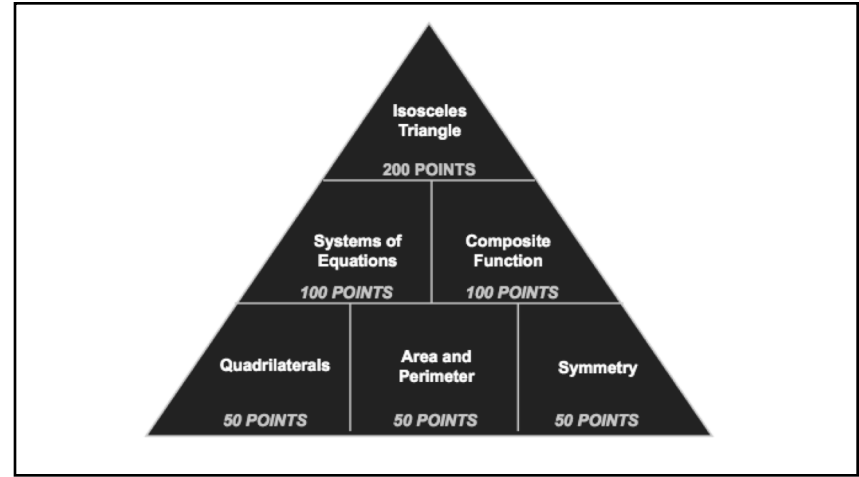
Carpenter et al., 2012; Cepeda et al., 2006; Dempster, 1988; Rohrer and Pashler, 2010

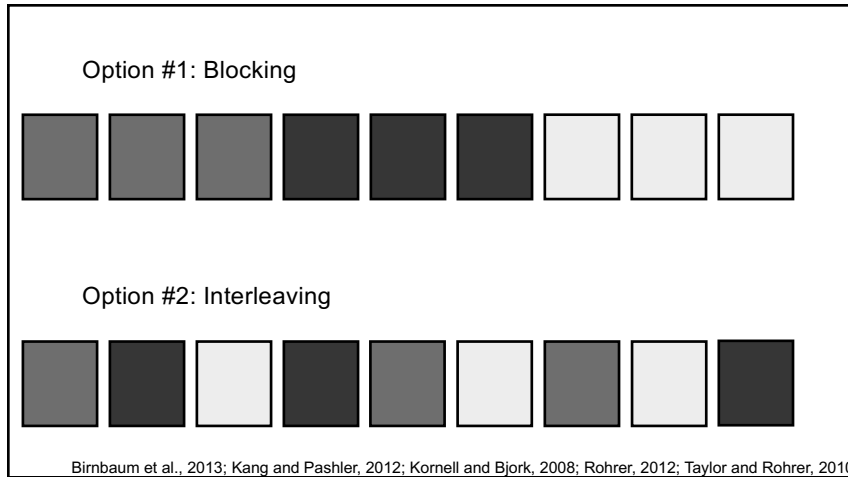
Make Student Thinking Visible...

1. Ask students to ob_____ and de_____ what they "see".
2. Build ex_____ and int_____.
3. Re_____ with ev_____.
4. Make co_____.
5. Consider different v_____ and pe_____.
6. Capture the big i_____ and form co_____.
7. Promote inquiry or the a_____ of more q_____.
8. Uncover the co_____ by going below the s_____.

Ritchhart, Church, and Morrison, 2011

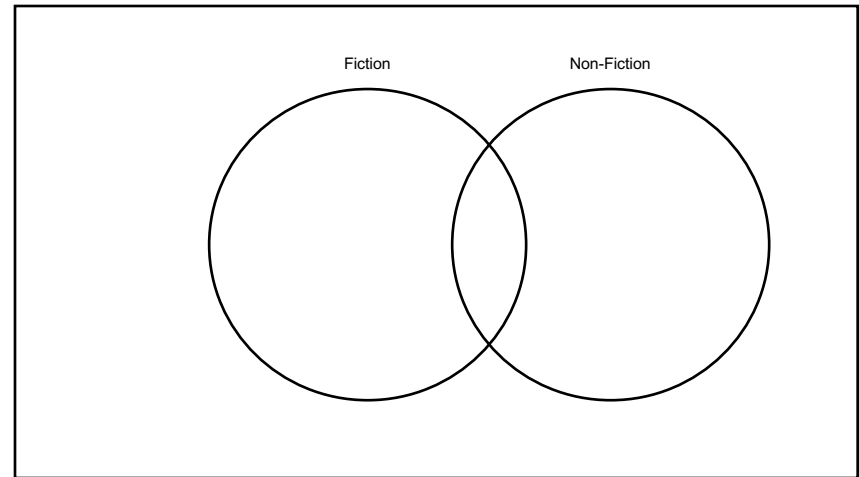
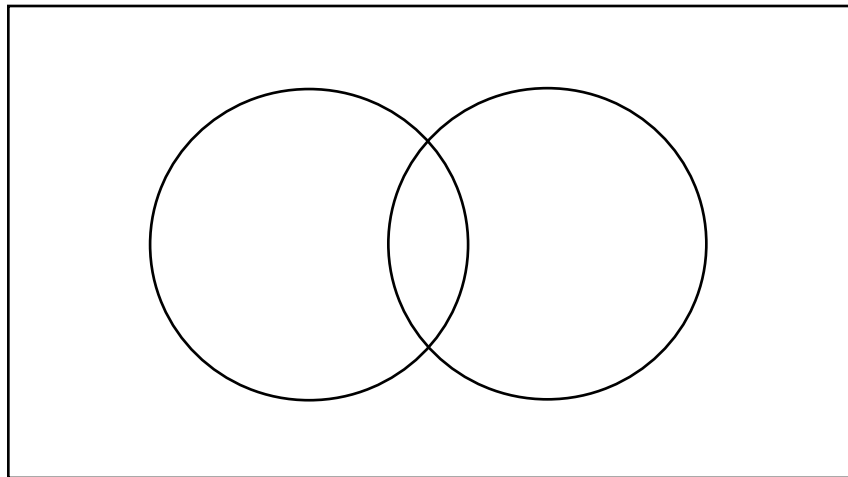


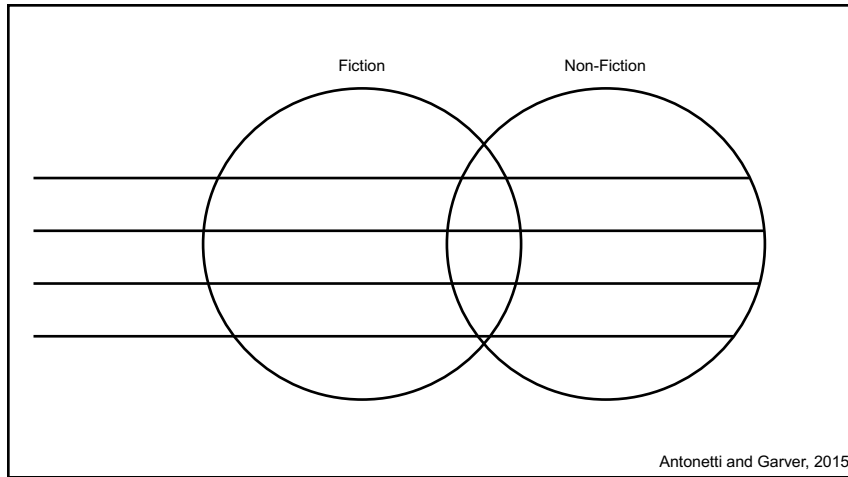




Desirable Difficulties

1. A study **st**_____y which makes it appear that you are **le**_____g quickly now will likely not support your **ab**_____y to **rem**_____r the information later (Yan, Clark, & Bjork, 2017).
2. The most robust techniques for **l**_____g - **t**_____m **le**_____g are referred to as **de**_____e **dif**_____s (Bjork, 1994).
3. For the very same reason that these **str**_____s are effective, learners and educators alike judge them to be **ine**_____e and **inef**_____t (Yan, Clark, and Bjork, 2017).
4. There is a difference between **perf**_____e and **le**_____g.
5. However, it is not the **st**_____y that leads to **l**_____g - **t**_____m **le**_____g, but rather the **cog**_____e **pro**_____s which are engaged by these strategies (Bjork & Bjork, 2014).





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