Breaking Down the Problem
New SI Session Strategies for Approaching Complex Word Problems

5 Steps to Finish
Students collaborate to create 5 steps necessary to complete a given problem. These usually include items such as: identifying what the problem is asking for, looking for unusual circumstances, etc. These 5 steps must incorporate everything needed to correctly solve the problem. After creating these steps, students will apply their process to actually solve a problem. The can work very well as an opener, closer, its own activity, or in combination with another activity.

Breaking Down the Problem
Students break down a hefty word problem line-by-line and highlight each sentence with a different colored highlighter. After the students completes this, they then explain what each sentence is giving them in their own words. Once that is complete, students will collaborate to solve the problem. Once the problem has been worked out, they will review their work and highlight the area of their work with the color corresponding to the sentence that gave them the information or prompted them to perform a task.
5 Steps to Finish Sample Plan

<table>
<thead>
<tr>
<th>Opener: (5-10 Min)</th>
<th>Content to cover:</th>
<th>Collaborative Learning Technique(s)</th>
<th>Strategy to be used:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Projectile Motion</td>
<td>Think Pair Share</td>
<td>5 Steps to Finish</td>
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Students will think back to the projectile motion problems we covered in class last week. They will be asked to come up with the 5 steps for completing the problem, in both the x and y directions, to get the Range and y-max values.

Once they have gotten their 5 steps written out, they will be assigned a partner to compare their steps. Then we will all come back together as a group to solidify the steps that we will then use in our first activity.

The 5 Steps:
1. Draw a Picture
2. Calculate $V_{Ox} = V\cos\theta$ and $V_{Oy} = V\sin\theta$
3. Using $V_{Fy} = V_{Oy} + at$, solve for $t$ ($a = 9.8$ since we are in y)
4. Calculate the Range by multiplying $t$ and $V_{Ox}$ → This is one of our final answers!
5. Using $y_{-max} = V_{Oy}t + \frac{1}{2}at^2$ where $t = \frac{1}{2} t_{-max}$ and $a = 9.8$, solve for $y_{-max}$ → this is one of our final answers!
**Breaking Down the Problem Sample Plan**

<table>
<thead>
<tr>
<th>Workout: (25 Min)</th>
<th>Content to cover:</th>
<th>Collaborative Learning Technique(s)</th>
<th>Strategy(ies) to be used:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Word Problems&quot; with CI</td>
<td>Clusters</td>
<td>Breaking Down the Problem</td>
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In clusters, students will work through a word problem, taking it line-by-line to fully understand what the problem is asking. They will highlight each sentence with a different color, then make a note off to the side of the page to put down what each line is saying. Students will then solve the problem. Once they have completed this, they will go back through their work and highlight/circle each step or area with the color highlighter they used for the sentence they got the info from. We will then come back together as a group. One student will write their work on the board, while I call on others to supplement the explanation.

**Problem:**

According to a 2013 study by Moebis Services Inc., an individual checking account at major US banks costs the banks more than $300 per year. A recent sample of 600 such checking accounts produced a mean annual cost of $430 to major US banks. Assume that the standard deviation of annual costs to major US banks of all such checking accounts is $35. Make a 95% confidence interval for the current mean annual cost to major US banks of all such checking accounts.

\[
\bar{x} = 430 \quad \text{(Sample Mean)}
\]

\[
\sigma = 35 \quad \text{(Population Standard Deviation)}
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\[
n = 600 \quad \text{(Sample Size)}
\]

\[
\text{We can state with 95% certainty that the mean cost to major US banks of all checking accounts is between $427.20 to $432.80.}
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