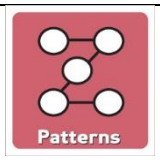
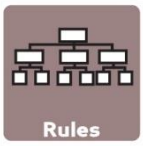
Planning with Depth and Complexity – J Taylor Education **POPCORN**		
		
		
		

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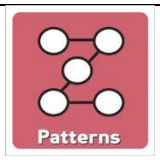
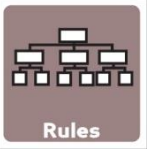
Planning with Depth and Complexity **POPCORN**	 What do the varied ways of preparing popcorn have in common?	 What questions do you have about popcorn?
 How do other cultures view popcorn?	 How do people you know (or across the country) flavor their popcorn?	 How do you define kernels, puffs, hull, pressure, erupts, seasoning?
 What guidelines do you follow when preparing popcorn?	 What distinguishes popcorn from other types of corn?	 What trends have affected the pricing of popcorn?
 What dilemmas might one face when serving popcorn at a family party?	 What is popcorn?	 How has popcorn preparation changed over time? How do you predict popcorn will be prepared in the future?

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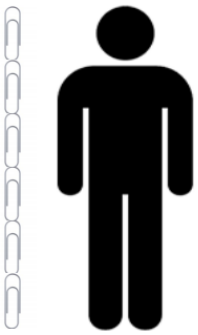
Mr. Short and Mr. Tall Task



When Mr. Short is measured in paper clips, he is 6 paper clips tall. When he is measured in buttons, he is 4 buttons tall.

Mr. Short has a friend named Mr. Tall. When Mr. Tall is measured in buttons, he is 6 buttons tall.

- How many paper clips tall is Mr. Tall?

Solve this problem as many ways as you can.

Adapted from: Riehl, S.M. and Steinthorsdottir, O.B. (2014). Revisiting Mr. Tall and Mr. Short. *Mathematics Teaching in Middle School,* Volume 20, Number 4, pages 220–228.

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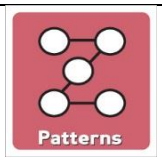
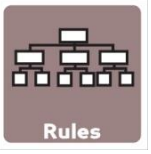
Planning with Depth and Complexity – J Taylor Education **MR. TALL AND MR. SHORT**		
		
		
		

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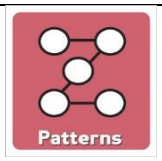
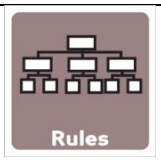
Planning with Depth and **MR. TALL AND MR. SHORT**	 What patterns helped you predict the height of Mr. Tall in paper clips?	 What questions do you have about solving ratio and proportional relationship problems?
 How do you use ratios and proportional relationships in Science?	 What comparisons can you make as to how you and your classmates solved the Mr. Tall and Mr. Short problem?	 What vocabulary terms (and definitions) are specific to the study of ratios and proportional relationships?
 How did the structure of the ratios you wrote help you solve the Mr. Tall and Mr. Short problem?	 What makes Mr. Tall and Mr. Short a ratios and proportional relationship problem?	 What dilemmas did you face when attempting to solve the Mr. Tall and Mr. Short problem?
 What struggles do you feel when you have to solve a problem with ratios that do not have common denominators?	 What general statement best describes the Mr. Tall and Mr. Short problem?	 What kind of connections can you make from working with fractions in 5th grade to working with ratios in 6th grade?

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Pruning Trees Task

It takes Keith 45 minutes to prune a tree. It takes Richard 70 minutes to a prune a tree. They form a company and agree to prune 92 trees.

- If they both work at the same time and at constant rates, how long will it take them to prune all 92 trees?

- How many trees will each have pruned?

Solve this problem as many ways as you can.

Adapted from: Cady, J.A. and Wells, P.J. (2016). Pruning Trees. *Mathematics Teaching in the Middle School*, Volume 22, Number 1, pages 6–10.

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QUESTION MATRIX – Chuck Wiederhold						
	Event	**Situation**	**Choice**	**Person**	**Reason**	**Means**
Present	What is?	Where When is?	Which did?	Who is?	Why is?	How is?
Past	What did?	Where When did?	Which did?	Who did?	Why did?	How did?
Possibility	What can?	Where When can?	Which can?	Who can?	Why can?	How can?
Probability	What would?	Where When would?	Which would?	Who would?	Why would?	How would?
Prediction	What will?	Where When will?	Which will?	Who will?	Why will?	How will?
Imagination	What might?	Where When might?	Which might?	Who might?	Why might?	How might?

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QUESTION MATRIX – Pruning Trees						
	Event	**Situation**	**Choice**	**Person**	**Reason**	**Means**
Present	**What is** the problem asking you to find out?	**When is** OK to stop listing multiples if trying to find the LCM?	**Which** unit rate **is** given?	**Who is** planting trees at a faster rate?	**Why is** 'guess and test' a reasonable strategy for this problem?	**How is** your approach to the problem the same or different than your classmates?
Past	**What did** you do first when solving this problem?	**Where did** you begin in solving this problem?	**Which** strategy **did** you choose to solve this problem?	**Who did** list multiples of 40 and 75?	**Why did** some students think it would take the boys 115 minutes to prune one tree?	**How did** you set up the problem?
Possibility	**What** equations **can** represent this problem?	**When can** solving a simpler problem help with solving this problem?	**Which** other unit rate **can** you use?	**Who can** set up this problem using 'nice numbers'?	**Why can** you use part to part ratios to solve the problem? part to total parts??	**How can** knowing the same number of minutes help to solve the problem?
Probability	**What** ratios **would** represent this problem?	**When would** someone suggest it takes the boys 57.5 minutes to plant one tree?	**Which** unit rate **would** you use to solve the problem?	**Who would** try to find out how many trees each boy could prune in one hour?	**Why would** you need more than one ratio table to solve this problem?	**How would** the LCM help you solve this problem?
Prediction	**What will** happen if you find the same number of trees for each boy?	**When** Keith prunes one tree, how many trees **will** Richard prune?	**Which will** make more sense: making the number of trees the same or making the number of minutes the same?	**Who will** plant more trees in the same time period?	**Why will** finding the LCM relate to finding the solution to this problem?	**How will** you write the two equations for a system of equations?
Imagination	**What might** happen if you find the same number of minutes for each boy?	**When might** you use estimation to solve the problem?	**Which** algorithm **might** help you find the LCM in an efficient way?	**Who might** use a single equation to solve the problem?	**Why might** you use a ratio table to solve this problem?	**How might** you approach the problem using a system of equations?

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