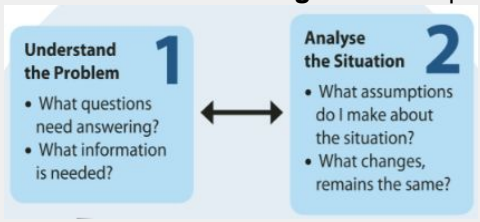
<table>
<tr><th colspan="2">Table: 3 - Act Math Tasks & Mathematical Modelling</th><th>Other Ideas</th></tr>
<tr><td colspan="2">Teacher - Pre-task/Before
- Chooses and works through a worthwhile task (in this case, a scenario), reflecting on connections to mathematical modelling
- Develops a good question related to learning goal and anticipated success criteria</td><td></td></tr>
<tr><td rowspan="2">Act 1</td><td>Teacher - Introducing the Task
- Develops the problem--building a narrative--with students using*
What do you notice? What do you wonder?
- Asks students to share estimates (too low; too high)*

(*Both provides teachers with insight as to the knowledge and skills students already have and may apply)

- Withholds information to help activate students' curiosity
- Collects a range of responses/possibilities to help students identify the need for greater precision</td><td rowspan="2"></td></tr>
<tr><td>Students - Introducing the Task | Connections to Modelling Framework
 

- As they come to understand the problem and recognize the need for greater precision (analyze the situation), students identify information that is required and any assumptions that might need to be made (analyze the situation)</td></tr>
<tr><td rowspan="2">Act 2</td><td>Teacher - During
-Provides just enough information after discussion of what might be required to engage further with the task</td><td rowspan="2"></td></tr>
<tr><td>Students - During
- Consider tools and resources they might need and set to the task of building a model
- Work collaboratively within and across visible random groups of their peers and help to further mobilize knowledge and thinking by working on vertical non-permanent</td></tr>
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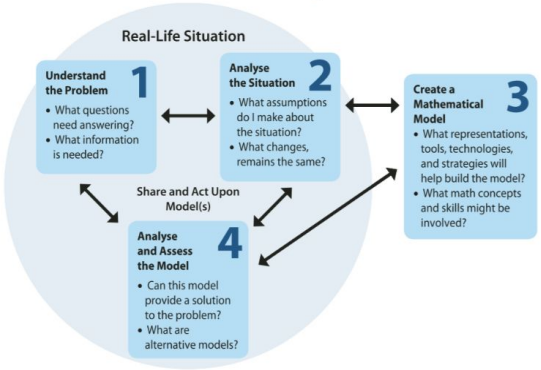
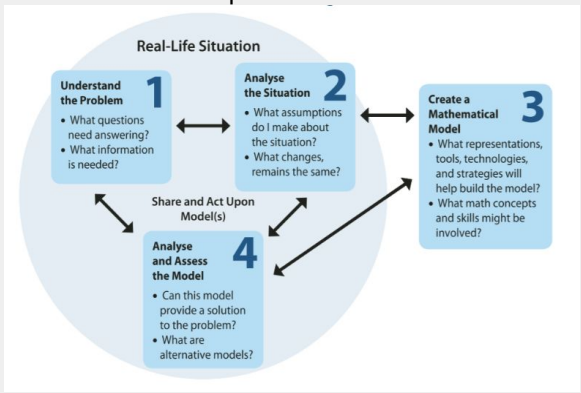
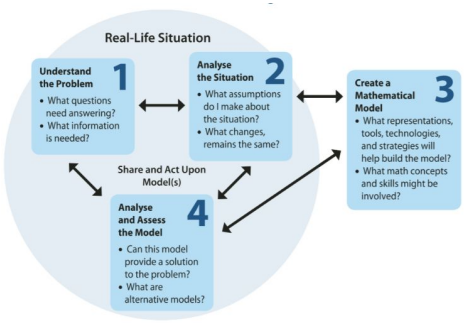
	surfaces **Students - *During* | Connections to Modelling Framework**  - *Create a Mathematical Model*: Students apply multiplicative and/or proportional thinking (in this task), through varied approaches, and representing their thinking in a variety of ways - *Analyze the Situation*: Students continuously reflect on the information given and required, as well as any assumptions made, and discuss with their teacher and peers - *Analyze and Assess the Model*: As students build and use their model, they question its validity and look to make improvements, leveraging their autonomy, interactions with their teacher, and information gathered through a consolidation period with their teacher and peers (see below)	
	Teacher - *During* - Uses hints and extensions to help manage *flow* (e.g., developing autonomy by encouraging groups to build off the ideas of others; challenging students to justify and explain their reasoning; modeling self-reflection through questioning) - Focuses on answering keep-thinking questions - Documents and enacts monitoring, and selecting and sequencing practices (5 Practices) in preparation to help students consolidate their thinking	
Act 3	**Teacher - *After*** - The 'reveal' (shows students the actual result) - Facilitates math conversation using sequenced students' approaches, inviting students to contribute their thoughts, ideas and understandings (including the result of using different approaches--e.g., efficacy, precision, efficiency); these approaches	

	build on one another - Helps students make connections between approaches; highlights key mathematical ideas - Records success criteria for further development and refinement later	
	Students - *After* | Connections to Modelling Framework  - Students decide if their model produces a result that answers the question (*Understand the Problem*) and how well that answer takes into assumptions and any new ideas brought out during a consolidation of approaches (*Analyze the Situation)* - Students reflect on the thinking and approaches (strategies) they've used to build and use their model (*Create a Mathematical Model*), incorporating any new ideas they have for improving their model--i.e., "How will these changes impact our current model? Will it produce a better answer?" (*Analyze and Assess the Model*)	
Sequel	**Teacher - *Post-task*** - Offers extensions, supporting engagement and providing opportunity for deeper learning to occur (i.e., continuing to manage *flow*) ● E.g., Encourages students to justify their approach(es), explain their reasoning, communicate their understanding and offer support to peers, and/or create their own sequel (solving for themselves and/or accepting to work with the sequel of another group). These extensions can be differentiated on the basis of student readiness: some students will be ready to create; others may need more time with communicating and/or checking their understanding ○ Creates opportunities for students to check their understanding and receive timely, descriptive feedback	
	Students - *Post-task*	

	 *During this time, students may: - Work on convincing themselves, their peers and their teacher - Review the process they (and their peers) took to model the scenario mathematically ● Giving consideration to why other models worked differently ● Deciding which model may be 'best' and why; and ● If no model presented as 'best', making decisions as to what they might do to improve their own model ○ Checking their choices, assumptions and decisions made along the way (*At this point, teachers and their students might choose to discuss just how dynamic mathematical modelling is as a process--i.e., students are simultaneously using the four components: *Understand the Problem*, *Analyze the Situation*, *Create a Mathematical Model*, and *Analyze and Assess the Model*. Teachers might choose to invite students to further refine success criteria and/or add new criteria.)	