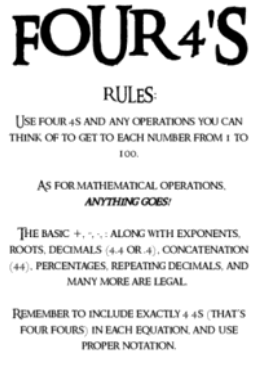
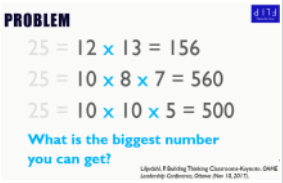
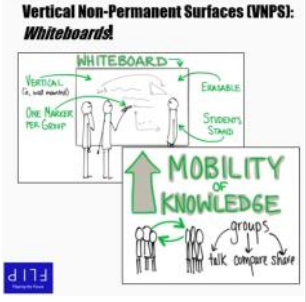
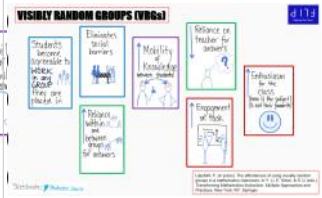
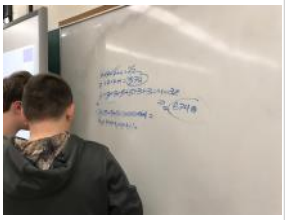
Journeying into Introducing #vnps & #vrg in Gr 9 Applied Math: Days 1 & 2

Introduction to #ThinkingClassrooms

How We're Engaging the Pedagogical System	Day 1	Considerations for Day 2	Day 2	Considerations for Day 3
	***BEFORE*** • We were wondering what the use of whiteboards and group work might bring about in terms of students' openness/ability to... -make their thinking visible -work, collaboratively, with others	-In addition to verbally narrating, write the learning goal for students to see	***BEFORE*** • In addition to goals from Day 1, how might students respond to working in #vrg (visible random groups)?	-Continue #vrg [Question: If #vrg is done enough, will this result in having to flexibly group students less often? => They will be able to work with anyone...especially reaching out to others (may not have before) to support needs they're identifying...students seeing themselves in *the* work/self-assessing against success criteria]
	**BEFORE** Task -We modeled using visualization and mental mathematics, the 'rules' for the task: Four 4s -Students' work was annotated on several #vnps (i.e., made concrete/symbolic) -Students used their own operations (factorial notation--i.e., 4!--was introduced); the #s 0 through 20 were requested	-We are looking towards intentionally incorporating tasks that engage students with the pedagogical system -We could differentiate the same task by asking students to consider other numbers (negative, decimals, concatenation) and use of parentheses to communicate variations in their order of operations	**BEFORE** Task -Goal: Students will be learning to solve optimization problems in two dimensions -We modeled using visualization and mental mathematics, the 'rules' for the task (below)  -Students' thinking was annotated, intentionally, on various whiteboards around the perimeter of the room -Observation: Most students chose 2 factors; prompting to go beyond was provided	-We are looking towards intentionally incorporating tasks that engage students with the pedagogical system and moving beyond 'fun,' singular activities towards connecting tasks to various aspects of curriculum (content, process, spiraling) • Today's task was a good example of an open task with possibility of leading into other content ○ We noticed that there was lots of opportunity to work with powers and optimization problems (i.e., good activation for optimization; fixed perimeter/area variable) -Moving forward, we are also curious to know what meaning students can/will derive from engaging in making and discussing their visible thinking during these types of lessons/tasks • We have lots of opportunities to collect perceptual data (i.e., #studentvoice)
	***BEFORE*** Classroom Environment Tools & Representations -We decided to allow students to self-regulate how they would interact w/ group members, #vnps -Students were organized into groups of 3 and assigned to a whiteboard -One marker per group	-What might it be like to make the groups visibly random? • How will students respond? • What might we notice about their interactions? -We noted how fluid it was for students (not writing) to insert their comments/ideas for others to write • Not all groups presented this dynamic ○ It will be good to mention this with students on Day 2	***BEFORE*** Classroom Environment Tools & Representations -Randomization was done by using playing cards, moving to their corresponding whiteboard -We encouraged students to 'ink' the thinking of those speaking 	-We might consider moving towards self-reflection/metacognition about learning processes with students re: #vnps #vrg towards on Day 5. • Have a discussion with students regarding the use of #vrg  • Using the benefits identified above, we could have students comment on them (or to derive their own as success criteria for collaborative, group work)
 	***DURING*** Classroom Environment Tools & Representations Classroom Discourse -We monitored students' approaches to calculating (trial-and-error, systematic, using calculators/mental math, checking appropriateness of solutions) -We monitored how students were visibly communicating their thinking (physical gestures/body language...'all-in', author, those dictating their thinking, how meaning-making was negotiated)	-As subsequent tasks are explored, we can focus more on naming & noticing (i.e., the mathematics, processes, learning skills) as students are working • We will have anticipated some of these and can document with students' input -Some ideas (below)	***DURING*** Classroom Environment Tools & Representations Classroom Discourse  	-Based on our observations, bring these to light for/with students for Days 3+ (emphasis on Classroom Environment) 

			  -Again, we monitored students' approaches to calculating (trial-and-error, systematic, using calculators/mental math, checking appropriateness of solutions) -Again, we monitored how students were visibly communicating their thinking (physical gestures/body language...'all-in', author, those dictating their thinking, how meaning-making was negotiated) -**NEW**: We noted that there was an increase in the mobility of knowledge...students were looking about to build their understanding (this would be good to highlight on Day 3+--name it--with students re: strategies for building knowledge in this type of classroom setting)	  
OUR SUCCESS CRITERIA • Learning Goal: To make 'space' to think mathematically,... – We can... • ...? • ...? • ...? • ...? 	***AFTER*** **Representations** **Classroom Discourse** -We prompted groups to check the examples provided by others -We used questioning to get at anticipated criteria • E.g., Describe how you organized your work/thinking (process-oriented) o Systematic vs Random Approach (teacher naming & noticing) • E.g., What do you think made your group's work successful (collaboration) o Students offered up: calculator (teacher name & notice: *tools*); talking to others...having a chance to come up with ideas	-Continue listening for students' previously-mentioned criteria/drawing attention to... -Listen for the following to name and notice with students: repeat, re-voice, agree/disagree (explain), build on, connect to, asking clarifying questions...emphasis on developing classroom discourse) -In subsequent experiences, we could use entry/exit tickets E.g., Exit Card **On a stick-it note,...** 3. Write a note to a peer describing what you learned during class today (including a 'to' and 'from'). Pass your note to your peer so they can have a chance to read your feedback. Post your stick-it notes so that others can make connections to what was learned today. AND/OR E.g,. Upon entry, ... -harvest ideas regarding process, talk, content (relate to goal) and post -position these as potential success criteria that students can return to later for re-consideration	***AFTER*** **Representations** **Classroom Discourse** -We asked students to examine the strategies they were using to produce their largest products (w/in the group); students self-regulated within their groups (some groups chose to look beyond their group) -Students were prompted to look around for the largest products and to look for patterns...possible relationships • Students connected (factors close to one another/product of same factors produced the larger products)	-Students were able to consolidate their learning re: content (optimization) -We recognize that more attention needs to be spent cultivating classroom community success criteria (e.g., #vnps, #vrg, math talk: repeat, re-voice, agree/disagree (explain), build on, connect to, asking clarifying questions) • Moving forward w/ this type of classroom setting and lesson style, we could collect perceptual data re: value of classroom discourse (measure periodically over the semester) E.g,. Upon entry, ... -Again, harvest ideas regarding process, talk, content (relate to goal) and post -Again, position these as potential success criteria that students can return to later for re-consideration (pictured above, there are various aspects of students' work that we can use to frame the learning experience they can have/generate next time)