Title:	**Topic of LA: Vote-Counting Methods** **Sequence in LES (#): 1** **Duration: 15 minute segment**	**Course:** **Mathematics CST** **Cycle/Year: Cycle 2 Year 3**
QEP Connections	**Items in Learning Progressions or QEP addressed in this LA:** **Social choice theory: "Compares and interprets different voting procedures and their results"**	
Learning Objectives	(These should guide your questions when pressing and responding to students response.) **By the end of this lesson, students will be able to describe three methods for vote-counting (majority, plurality and elimination) and will have a starting understanding of social choice theory.**	
Professional Learning Goals	(Identify a problem of practice that you would like to work on during this lesson.) **Orienting student to each other's ideas and to the educational goal.**	
Materials Needed	**Multicolour post-it notes, some sort of board**	
Prerequisite Knowledge	**None – this is intended to be the first lesson in the unit**	

Time	**Plan** (In your plan, show evidence of anticipated strategies from students, which ones you would emphasize and how you would do it.)	**Key questions to ask students** (How will you press on their thinking? Think about the various strategies that you anticipated also.)	**Principled ideas** (Based on the principles of high quality teaching presented in class.)
1 min	**Voting activity:** - Give each student four multi-colour post-it notes. - Ask them to rank the colours in order of preference and stack so their favourite is on top. - Have each student vote by sticking their stack of notes on the board. - Ask students to organize the votes in a meaningful way.		Establishing and maintaining expectations for student participation.
5 – 10 min	**Discussion:** - Open discussion by asking "who is the winner" and using questions (examples to the right) to provoke students to broaden their thinking. - When a student has an opinion on the winner, ask how they came to that result and write this down on the board. - Anticipated student strategies: go for the simplest answer (plurality, i.e. the colour with the most votes wins) first, will need prompting to find other solutions - Guide the discussion around to include plurality, majority and elimination methods. Circle these three on the board and give them names.	What is the class's favourite colour? How did you arrive at that conclusion? (What criteria?) If we pick that answer, will more than half the class agree (/disagree)? Is there another way to find a winner? Is there a way to take people's second choices into account? Under the system you're suggesting, is there always a winner?	Children are sense - makers. Teachers must design instruction for all children to do rigorous academic work in school and have equitable access to learning. Orienting students to each other's ideas and to the mathematical goal.

4 min	**Demonstration of elimination method:** - Elimination method, also called Instant Run-off voting, means we eliminate the least-favourite candidate and distribute their votes according to the second-place choices. This repeats until one candidate has a majority of votes. - Important: students should have (perhaps under guidance) arrived at this method through their own discovery - Have one or two students who seem to understand the method come and demonstrate it with the post-its. Have them narrate what they are doing to the class. - Anticipated student strategy: sometimes students do not realize the iterative process of elimination method and stop after one round even though no candidate has a majority.	What is your first (/next) step? Can you explain why you are doing that to the class? Can we declare a winner now? Why/why not? Why are you doing this two times? / Could you think of a scenario where you would have to repeat this process? Until when?	Children are sense - makers. Positioning students competently.
As time permits	(At this point, I feel I have fulfilled my learning objectives, and have three options which I will choose from depending on how much time remains, the feel of the class, and what happened earlier) 1. Prompt discussion around question "what advantage did raking the votes give us?". Guide using questions such as examples to right. 2. Start a broader discussion on voting and democracy as per the class interest. Potential topics here include the majority rule, single-winner vs. proportional systems... lots of good stuff. 3. If the example generated by the post-its was not very fruitful (e.g. there was a majority winner immediately), redo voting or give a hypothetical example to highlight differences.	What advantage did we get from ranking the votes? How does this compare to our own electoral system? What didn't change between the methods?	Teachers must know their students as individuals and as learners. Eliciting and responding to student thinking.

Summary and closure:
Wrap up by noting that we have introduced a key concept (majority rule) and three methods to count votes: plurality, majority and elimination. Briefly preview upcoming material: two even stranger methods to count votes!

Note to the class: the LES would continue with an investigation into two other single-winner voting methods, the Borda count and the Condorcet winner. If they are interested in learning more or having resources to teach they can check out my full LES, http://stevesmathsite.wordpress.com/.

Anticipated blackboard (*At the end of the lesson. If you are working with a SmartBoard, think about how your summary will look like.*)