

## An Instructor's Clicker Cheat Sheet

**2,400 ... estimated number of students per year in EOS courses using clickers.**

**If you are not using clickers yet – consider doing so!** Clickers illuminate the thinking of ALL students in your course. They can enable peer and class discussions, help students practice applying concepts, reveal misconceptions to you AND students, deliver instant feedback about thinking, and so on. BUT it does take practice !

This page gives tips on >basic good practices, >types of questions, >running a question in class, and >reacting to results in real time during the class. Start small! It's not hard, but don't try everything all at once. **Try . . .**

- *Introducing or improving one or two questions based on prior experience with the concepts (items I and II).*
- *Adjusting your actions in one class; e.g. question spacing or circulating while students think, etc. (item III).*
- *Adjusting how you respond to the clicker results that you see for one or two questions (items IV, V).*

### **I. "Standard Practice"**

1. Do not use clickers for testing. They are for promoting thinking, and revealing it to you AND students.
2. Simple peer discussion questions are most common and the best place to start.
3. Try running a tough question twice: solo followed by peer discussion.
4. Consider two questions, with the second being a "why" or "how can you tell" type of question.
5. Try asking a question early in the class; DO NOT FOLLOW UP, then ask again later in class or another day.
6. Space out lecturing with clicker questions at least every 10 minutes or so, starting at the **beginning** of class. Or ... some instructors are now using clickers to DRIVE or define the learning throughout a class (advanced).
7. Clickers are excellent for punctuating group activities. They can even constitute the primary deliverable of a group or worksheet based in-class activity.

**Some ideas for responding to the voting results are listed on the next page.**

### **II. Generic clicker question types**

1. Opinion question (no correct answer).
2. "Relative" question, where answers are more / less / same, or increase / decrease / no change / not enough information. These are excellent discussion starters.
3. More than one answer is right. Requires careful follow up in class.
4. Show several possibilities, and ask to choose combinations.
5. "Ranking" a sequence or set of values.
6. Show several possibilities, and ask to choose how many are relevant.
7. "Thought questions" – see [http://www.cwsei.ubc.ca/resources/files/CU-SEI\\_Thought\\_Questions.pdf](http://www.cwsei.ubc.ca/resources/files/CU-SEI_Thought_Questions.pdf)
8. Combinations are possible, eg #5 and #4, or #5 and #6, or others.
9. Try on-the-fly questions. E.g. Pose question out loud, write options on the board (software runs as usual).

### **III. While students are thinking about the question and making their decision ...**

1. Do NOT bother reading the whole question with answers. BUT you could discuss aspects while the question is up before you hit the START button.
2. Be clear about whether thinking is to be SOLO, in PAIRS or in GROUPS.
3. CIRCULATE. Never stand around doing nothing. Listen to the thinking. This is invaluable feedback to you the instructor. Help if you like.
4. Sometimes you could quietly warn a group or individual that they will be asked to comment on thinking.
5. If you hear "irrelevant chatter", the question was open for too long.
6. Watch the count and WARN at 10 secs. BEFORE you close the voting (5 secs. is not enough).

#### IV. Recommendations while following up after voting

1. If possible, call on specific groups (instead of individuals) to start the discussion.
2. To call on individuals: a) use name sticks, or b) pick individuals as you circulate BEFORE closing voting.
3. Call for input from specific rows or quadrants of the room (or anyone wearing blue ... etc. ).
4. Emphasize the need to hear **evidence or logic**. Avoid simply asking “why did you chose ....”
5. Do NOT do all the explaining. ALSO - labeling correct answers prevents listening and participating.

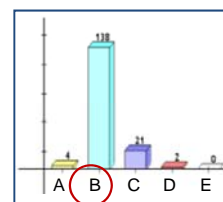
#### V. Tactics for responding to voting results:

Again, these are suggestions. If you have other ideas or recommendations, communicate your experience with colleagues.

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1. **Mainly right:** IF YOU CAN SEE RESULT FIRST, start by NOT revealing correct answer.

Regardless, try:

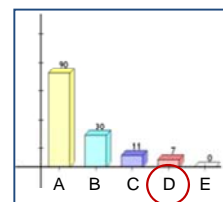
- a. Ask “How did you **eliminate A?**”
- b. Ask “What was one **line of evidence or logic** that helped you choose B?”
- c. **OR** ... simply say “Seems that was easy – let’s move on ...”,  
THEN re-evaluate what this question was for next time you use it.



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2. **Mainly wrong (often the best opportunity for a “learning moment”.**

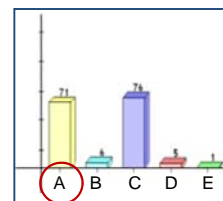
The challenge here is “how much time to spend sorting out causes of error?” Next time you use the questions you will know better how to adjust pacing to maximize learning.

- a. Do NOT reveal the answer right away.
- b. Ask “what evidence could lead someone to chose A?” Then again for “B”.  
Discovering a misconception should lead to discussion or explanation
- c. OR ... **Do mini lecture / Socratic lecture / demo.**; then students vote again.
- d. OR ... if first vote was solo ... convince your neighbor and vote again.
- e. OR ... if first vote was in pairs ... convince ANOTHER neighbor and revote.
- f. OR ... jot reasons on paper, exchange snowballs, choose individuals to read what they picked up.



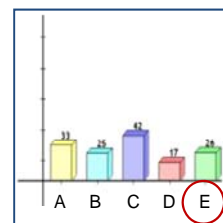
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3. **Bimodal:** Focus on BOTH preferred answers to reveal sources of misconception without revealing answer – yet.

- a. Ask “What evidence / logic suggests – A” and “Same for C”.
- b. ENSURE students speak to the evidence or the logic they used.
- c. Consider **similar tactics to types 1 and 2.**



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4. **Random**

- a. Look for reasoning using **tactics 1a, 1b.**
- b. Follow up and/or revote using tactics of type 2 and 3.
- c. Tell students “**options x (and y) are wrong**”, then re-discuss, re-vote.
- d. If this is a “survey” or “none are right” or “all are right”, ask students to explain what was difficult about making a decision here.



Everyone has their own clever tricks. Clicker use is growing because it enables so many new opportunities for interactive learning. Try it. You’ll love it.

#### Further Resources

- <http://www.cwsei.ubc.ca/resources/clickers.htm> The CWSEI clicker website.
- <http://www.colorado.edu/physics/Web/clickers.html> University of Colorado Physics guidelines for clickers.
- <http://www.elearning.ubc.ca/toolkit/clickers/> and <http://wiki.ubc.ca/Documentation:Clickers> UBC’s resources sites for using and setting up clickers.

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**Contact EOS-SEI:** To talk about your course(s) or teaching and learning in general, visit EOS-South 361, or contact Francis Jones ([fjones@eos.ubc.ca](mailto:fjones@eos.ubc.ca)) or Brett Gilley ([bgilley@eos.ubc.ca](mailto:bgilley@eos.ubc.ca)). See also <http://www.eos.ubc.ca/research/cwsei/>.