



Carl Wieman Science Education Initiative  
at the University of British Columbia



# WORKSHOP: Using Clickers Effectively

## CWSEI End-of-Year Event

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*Credits: Clicker Resource Guide from CU-SEI and CWSEI*

# WORKSHOP: Using Clickers Effectively

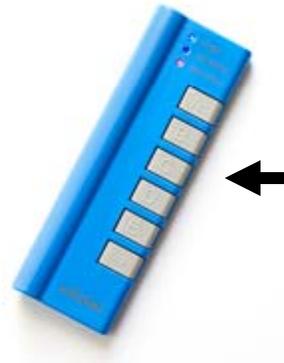
## Workshop GOALS

1. Articulate your own reasons for (or against) using clickers in YOUR class
2. Write a thought-provoking clicker question about something you consider important
3. Respond to class answers (histograms) in real time

# What are clickers?

**i>clicker**  
The Decision is Simple

[HOME](#) [TE](#)



← The Instructor's clicker

How do you think using clickers will  
HELP in your class?

- A.
- B.
- C.
- D.
- E.

What are your CONCERNS  
about using clickers?

A.

B.

C.

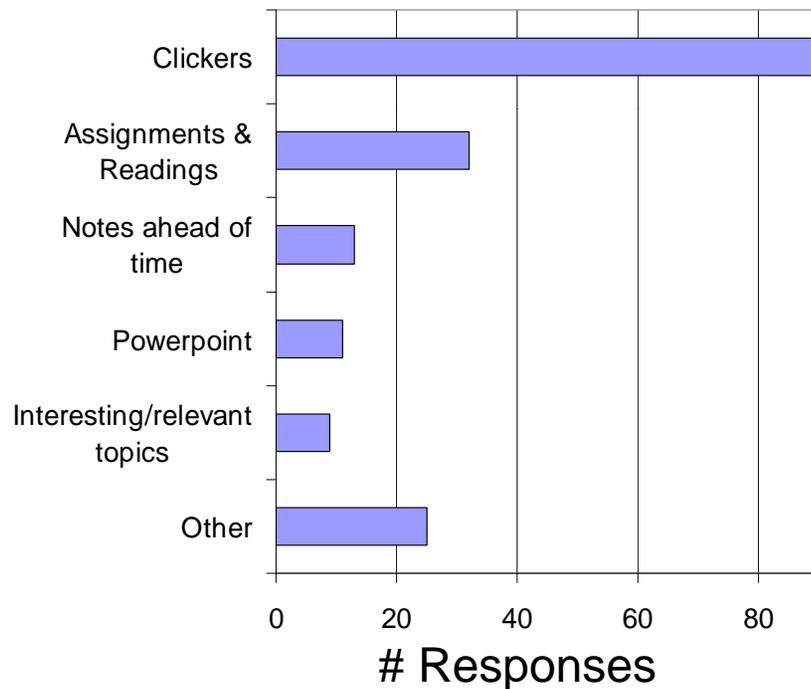
D.

E.

# What do students think?

End-of-Term survey, upper-level science course (200 students)

What do you think worked well in this course, and why?



*“clicker questions helped me understand major concepts and how to apply the material”*

*“it gave me a sense of what I understood and what I didn't.”*

*“clicker questions were really helpful because they made me to think about the material during class.”*

*“I liked the clicker questions because they made me think deeper into particular concepts, but I did find them very challenging.”*

# Stages of clicker use

1. Stage 1 – asking simple, primarily factual questions.
2. Stage 2 – asking more challenging conceptual questions, or questions where the answer is not obvious and critical points could be argued.
3. Stage 3 – Lecture is structured around a set of challenging clicker questions that largely embody the material students are to learn.

# Bloom's taxonomy VERBS for Stage 1 (knowledge)

Know

Define

Memorize

Repeat

Record

List

Recall

Name

Relate

## Level 1 example

Who is/was the 12<sup>th</sup> president of UBC?



A. Martha Piper



B. David Strangway

C. Leonard S. Klinck

D. Frank F. Wesbrook

E. Stephen Toope



## Bloom's taxonomy VERBS for Stage 2 (Comprehension, Application)

Discuss  
Describe  
Recognize  
Explain  
Express  
Identify  
Locate  
Report  
Review  
Tell  
Restate

Translate  
Interpret  
Apply  
Employ  
Use  
Demonstrate  
Dramatize  
Practice  
Illustrate  
Operate  
Sketch

## Level 2 example

Two black cats are crossed.

Which of the following outcomes is **not** possible?

- A. Only black kittens.
- B. Black and brown kittens.
- C. Black and cinnamon kittens.
- D. Black, brown and cinnamon kittens.
- E. All are possible.

$B > b > b'$

$B$ — black

$bb$  or  $bb'$  brown

$b'b'$  cinnamon



# Bloom's taxonomy VERBS for Stage 3 (Analysis, Synthesis, Evaluation)

Distinguish  
Analyze  
Differentiate  
Appraise  
Calculate  
Compare  
Contrast  
Diagram  
Debate  
Relate  
Examine

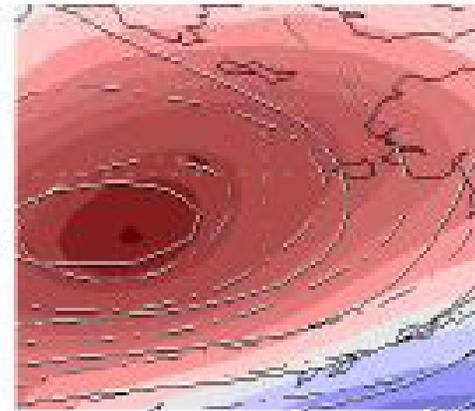
Compose  
Plan  
Propose  
Design  
Formulate  
Assemble  
Construct  
Collect  
Create  
Design  
Organize

Judge  
Appraise  
Evaluate  
Rate  
Value  
Revise  
Score  
Select  
Choose  
Estimate  
Measure

# Level 3 example



Q: This arrangement of pressures from sea level, 4 km, and tropopause, would



- A) support cyclogenesis.
- B) have little effect on cyclone evolution.
- C) support cyclolysis.
- D) support anticyclogenesis
- E) (not enough info to answer)

## How to write a clicker question:

1. Pick a concept or skill you think is important and/or difficult for students.
2. If you know them, identify any common misconceptions to use as distractors.
3. Write the question as simply and clearly as possible.

There's lots of literature about writing effective MC questions. It's not easy. Here's a link to get started with the issues around MCQs:

[http://teambasedlearning.apsc.ubc.ca/?page\\_id=163](http://teambasedlearning.apsc.ubc.ca/?page_id=163)

# ACTIVITY 1:

## Write a clicker question

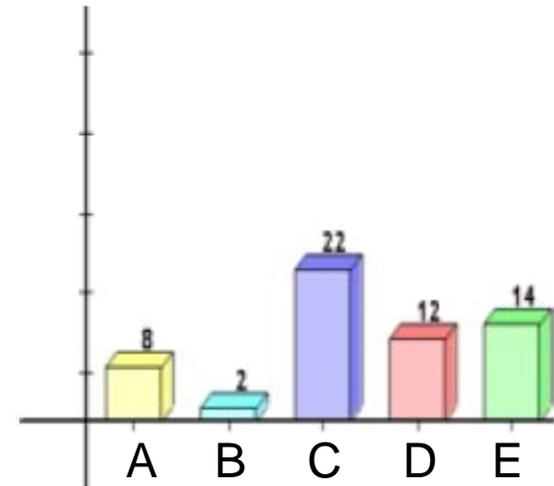
1. Pick a concept or skill you think is important and/or difficult for students.
2. If you know them, identify any common misconceptions to use as distractors.
3. Write the question as simply and clearly as possible.

(Participant example questions)

## How to respond to histograms:

What would you do if you got this histogram?

- A.
- B.
- C.
- D.
- E.



# How to respond to histograms:

**Example:** Why do we have seasons on Earth?

- A. Because the Earth is spinning
- B. Because the Earth is tilted
- C. Because the Earth is spherical
- D. Because the Earth is sometimes closer, sometimes farther from the Sun
- E. Because the Earth's equator is closer to the Sun than the poles



# ACTIVITY 2: Respond to histograms

**ROLES:** Person with the longest commute is the “INSTRUCTOR”. Others in group are the students.

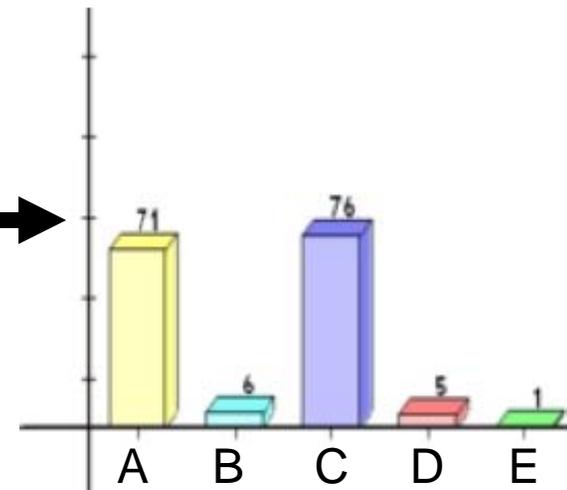
**THE QUESTION:** Use the question written by the “Instructor”.  
Alter as needed to make “A” be the correct answer.

**FIRST:** Give everyone in the group a chance to read the question.

**NEXT:** Respond to this histogram →

*What are you going to say?*

*What are you going to do?*



# ACTIVITY 2 (cont): Respond to histograms

**ROLES:** Rotate the INSTRUCTOR one person to the left

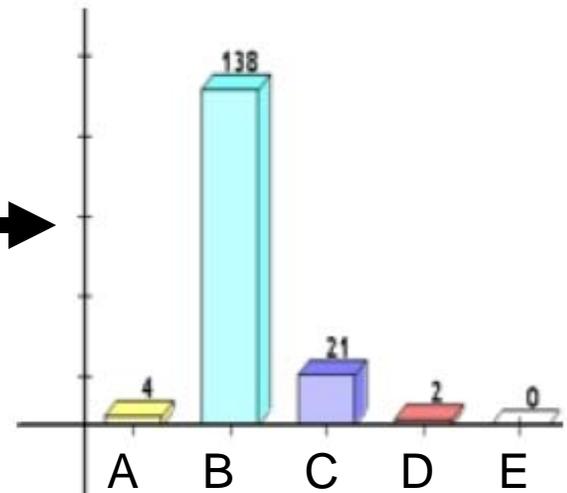
**THE QUESTION:** Use the question written by the “Instructor”.  
Alter as needed to make “B” be the correct answer.

**FIRST:** Give everyone in the group a chance to read the question.

**NEXT:** Respond to this histogram →

*What are you going to say?*

*What are you going to do?*



# ACTIVITY 2 (cont): Respond to histograms

**ROLES:** Rotate the INSTRUCTOR one person to the left again.

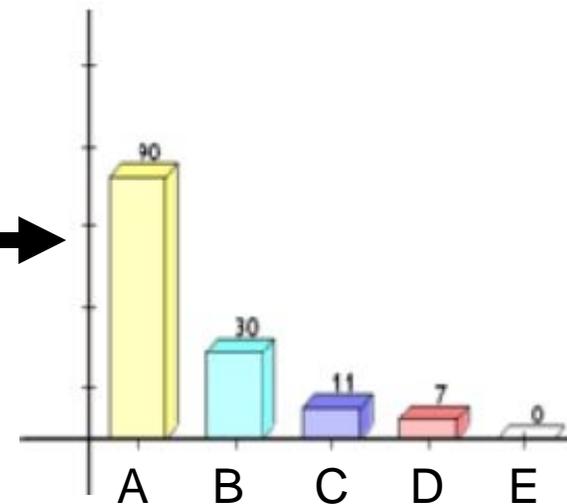
**THE QUESTION:** Use the question written by the “Instructor”.  
Alter as needed to make “D” be the correct answer.

**FIRST:** Give everyone in the group a chance to read the question.

**NEXT:** Respond to this histogram →

*What are you going to say?*

*What are you going to do?*



# ACTIVITY 2 (cont): Respond to histograms

**ROLES:** Rotate the INSTRUCTOR one person to the left again.

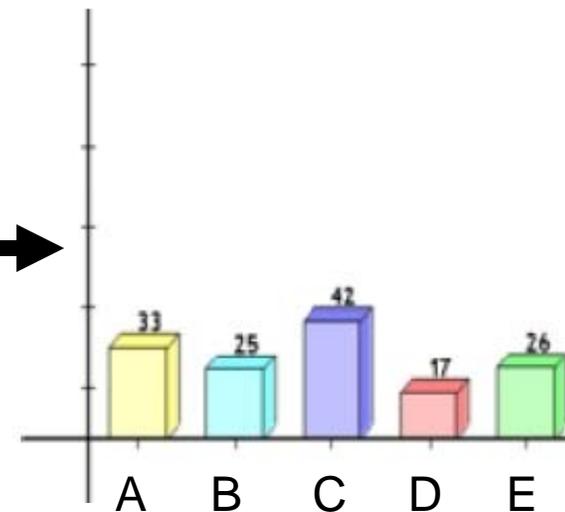
**THE QUESTION:** Use the question written by the “Instructor”.  
Alter as needed to make “E” be the correct answer.

**FIRST:** Give everyone in the group a chance to read the question.

**NEXT:** Respond to this histogram →

*What are you going to say?*

*What are you going to do?*



## Tips for Effective Planning

1. Use clickers regularly (every day)
2. Carefully consider your marking scheme
3. Clearly communicate your expectations to students (verbally, in writing, often)
4. Recognize that using clickers takes class time. Consider ways for students to learn some content outside of class.

# Revisit Workshop Goals

1. Articulate your own reasons for (or against) using clickers in YOUR class
2. Write a thought-provoking clicker question about something you consider important
3. Respond to class answers (histograms) in real time

# Resources & Logistical Support

Lots of concise, useful resources about using clickers effectively:

<http://www.cwsei.ubc.ca/resources/clickers.htm>

You'll need a VISTA site for your course so that students can register their clicker IDs:

<http://www.elearning.ubc.ca>

Tips for writing good multiple choice questions:

[http://teambasedlearning.apsc.ubc.ca/?page\\_id=163](http://teambasedlearning.apsc.ubc.ca/?page_id=163)

*(thanks to Jim Sibley)*

You can email Clicker Support on campus:

[clicker.support@ubc.ca](mailto:clicker.support@ubc.ca)

## Feedback about this workshop

Please fill out the feedback forms so we can improve this workshop.

**THANKS!**