

1. Go to [learningcatalytics.com/demo](https://learningcatalytics.com/demo)
2. Enter info, click "Start"
3. Join session 123456789

EDUCACION



# Catalyzing learning with Learning Catalytics



Pearson Demonstration  
EduTECH 2015  
Brisbane, Australia, 3 June 2015





# Catalyzing learning with Learning Catalytics



@eric\_mazur

Pearson Demonstration  
EduTECH 2015  
Brisbane, Australia, 3 June 2015

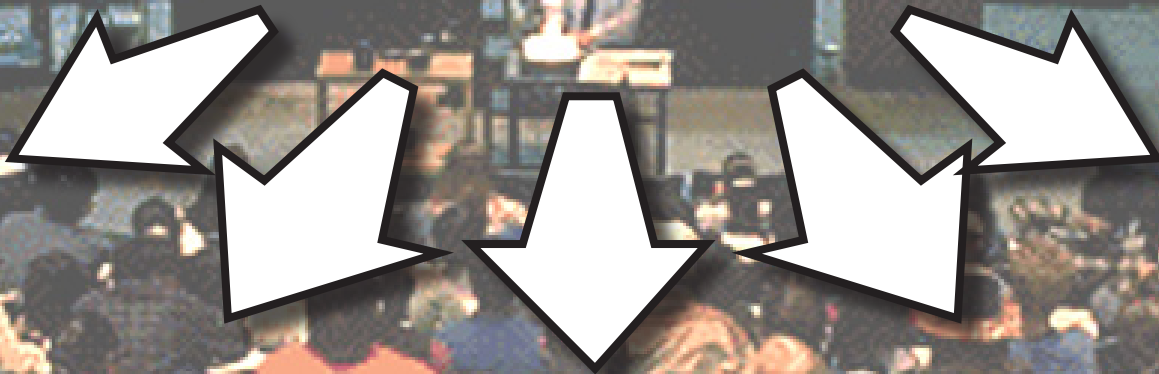
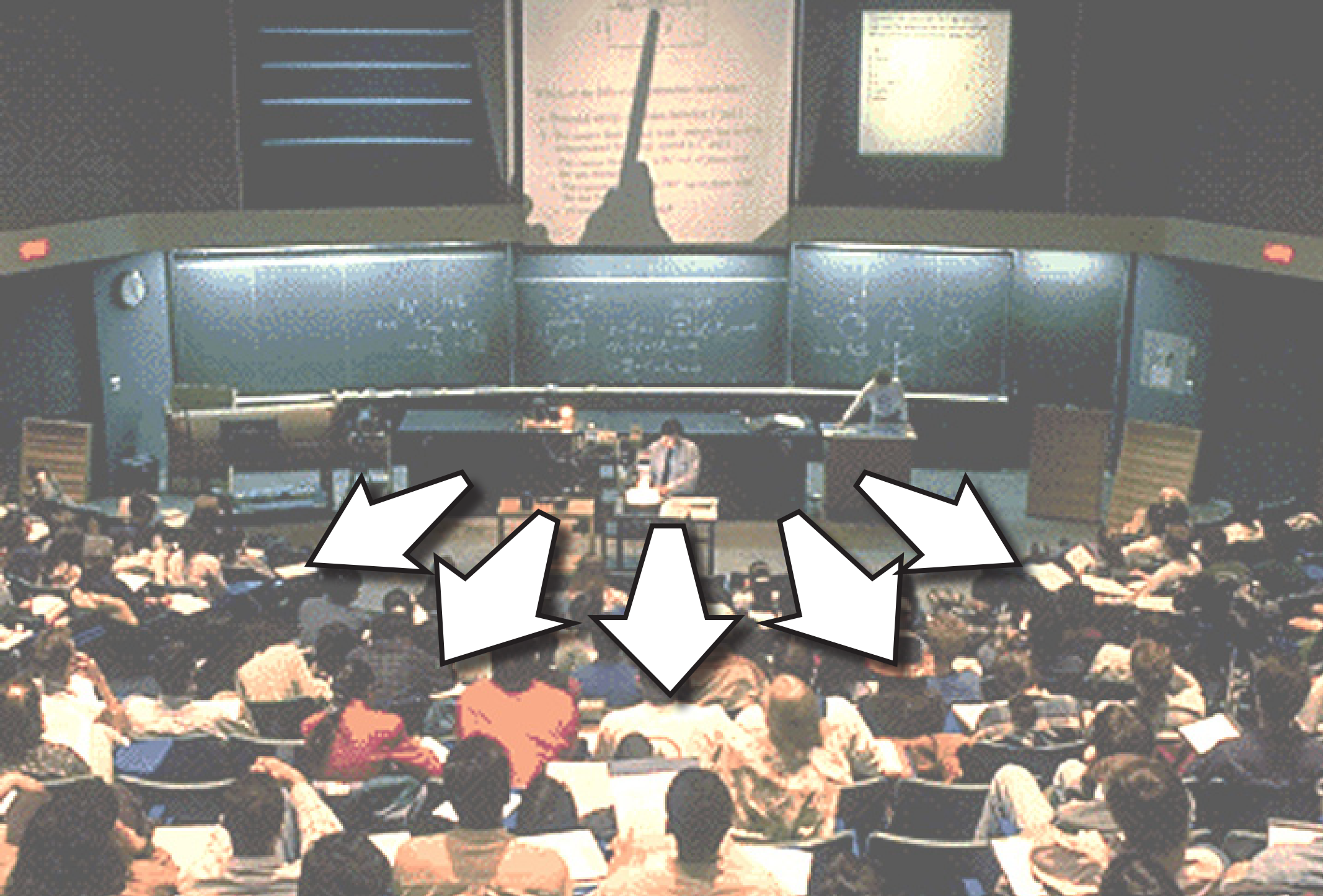




1. Go to [learningcatalytics.com/demo](https://learningcatalytics.com/demo)
2. Enter info, click "Start"
3. Join session 123456789

EDUCACION







question

1 education

2 PI



question



think



question



think



poll



**question**



**think**



**poll**



**discuss**



**question**



**think**



**poll**



**discuss**



**repoll**



**question**



**think**



**poll**



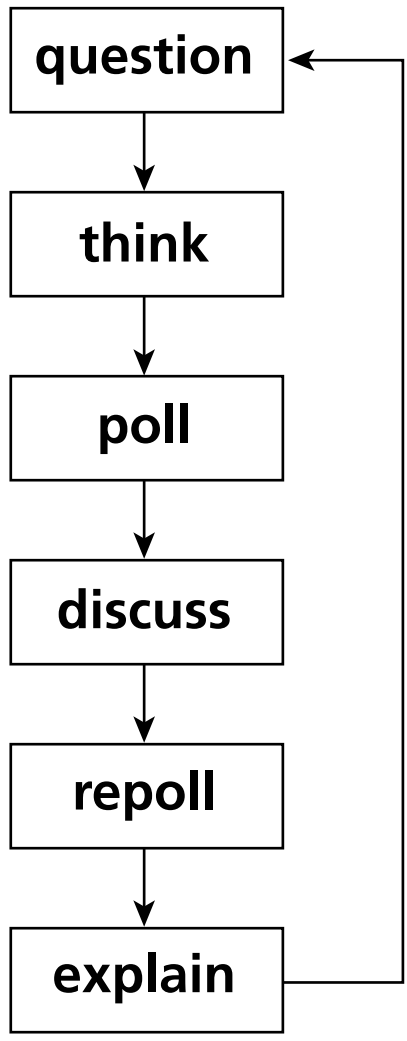
**discuss**



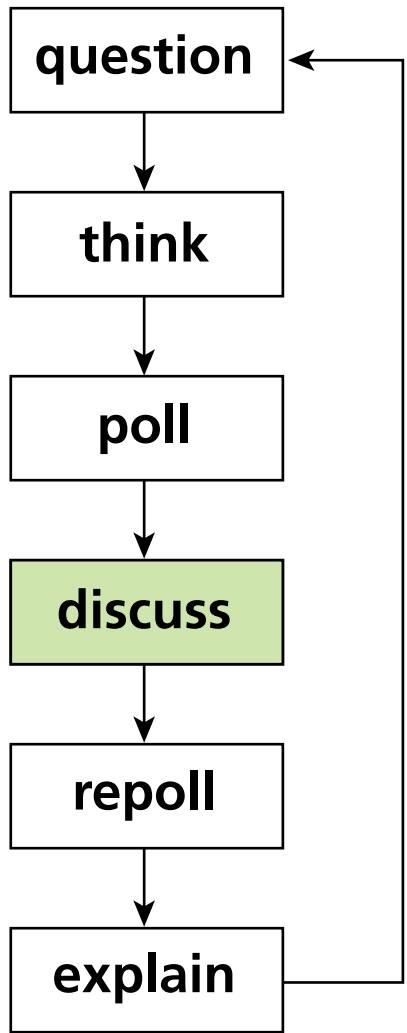
**repoll**



**explain**







**feedback**

**1** lecture

**2** PI

**3** PI 2.0





1991



1 lecture

2 PI

3 PI 2.0



1993



A black handheld remote control is shown at an angle. It features a numeric keypad with buttons for digits 1 through 9, 0, and a red power button. A green logo with the letters 'FRS' is visible on the bottom right. The year '1998' is overlaid in large white text in the center.

# 1998



1 lecture

2 PI

3 PI 2.0



# technology

1 lecture

2 PI

3 PI 2.0





How do I...

- design good questions?
- optimize the discussions?
- manage time?

# learning | catalytics

1 lecture

2 PI

3 PI 2.0

Use intelligent algorithms and data analytics to...

- improve questioning
- manage discussions
- facilitate time management/flow



- lowest
- a. A 30-year fixed rate mortgage at 12%
  - b. A 15-year fixed rate mortgage at 12%
  - c. A 30-year fixed rate mortgage at 12%
  - d. A 15-year fixed rate mortgage at 12%
2. The biggest factor that leads American companies to manufacture their products overseas in India is:
- a. Higher quality of craftsmanship
  - b. Lower labor costs
  - c. Decreased transportation costs
  - d. Effective legal systems
3. Which of the following correctly summarizes the accounting equation for a sole proprietorship?
- a.  $\text{Assets} = \text{Liabilities} + \text{Owners' equity}$
  - b.  $\text{Liabilities} = \text{Assets} + \text{Owners' equity}$
  - c.  $\text{Owner's equity} = \text{Assets} + \text{Liabilities}$
  - d.  $\text{Revenue} = \text{Assets} - \text{Liabilities}$
4. In order to present a business plan to a group of potential investors, a businessperson would most likely use which of the following?
- a. Powerpoint
  - b. Quickbooks
  - c. Peoplesoft
  - d. Excel
5. In order to start an online business, and individual would need all but which of the following:
- a. business model
  - b. depreciation?

## extensible plug-in architecture for question types

- a. A 30-year fixed rate mortgage at 12%
- b. A 15-year fixed rate mortgage at 12%
- c. A 30-year fixed rate mortgage at 12%
- d. A 15-year fixed rate mortgage at 12%

2. The biggest factor that leads American companies to manufacture their products over India is:
- a. Higher quality of craftsmanship
  - b. Lower labor costs
  - c. Decreased transportation costs
  - d. Effective legal systems

3. Which of the following correctly summarizes the accounting equation for a sole proprietorship?
- a.  $Assets = Liabilities + Owners' equity$
  - b.  $Liabilities = Assets + Owners' equity$
  - c.  $Owner's equity = Assets + Liabilities$
  - d.  $Revenue = Assets - Liabilities$

4. In order to present a business plan to a group of potential investors, a businessperson should most likely use which of the following?
- a. Powerpoint
  - b. Quickbooks
  - c. Peoplesoft
  - d. Excel

5. In order to start an online business, an individual would need all but which of the following:
- a. business model
  - b. appreciation?

## Sample question types:

- direction
- expression
- long answer, short answer, word cloud (fill in text)
- multiple-choice, many-choice
- numerical (enter a number)
- ranking
- region (select point on image)
- sketch





**1** [learningcatalytics.com/demo](https://learningcatalytics.com/demo) **2** enter info **3** ID 123456789

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classroom](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

4. direction  
prevailing

...le. The image provides several clues about the direction of  
...on your screen.

[Deliver](#) [Show all results](#)



**1** educa

**3** PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classroom](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

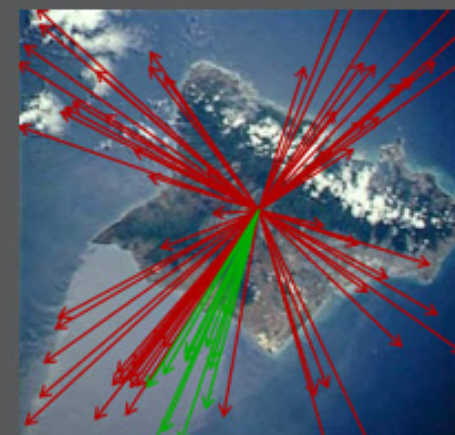
4. direction  
prevailing

...le. The image provides several clues about the direction of  
...on your screen.

[Deliver](#) [Show all results](#)

Round 1

77 responses, 16% correct



✓ 17 get it now  
✗ 3 still don't get it



1 educa

3 PI 2.0



# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classrooms](#) [Account](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

optics i

current session: 766079 | 69 students

[Back to all lectures](#) [Stop session](#) [Review results](#) [Seat map](#) [Show floating session ID](#) [Edit](#) [Delete](#)



Jump to ▾

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15



4. direction Light enters horizontally into the combination of two perpendicular mirrors as shown below.

[Deliver](#) [Show all results](#)



Indicate the direction of the incident light after it reflects off of both mirrors.

feedback & support

1 lecture

2 PI

3 PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classifications](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

current session: **766079** | 69 students

[Map](#) [Show floating session ID](#) [Edit](#) [Delete](#)

6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

[Deliver](#) [Show all results](#)

[feedback & support](#)



**1** lectur

**3** PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classifications](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

current session: **766079** | 69 students

[Map](#)  [Show floating session ID](#) [Edit](#) [Delete](#)

6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

[Deliver](#) [Show all results](#)

[feedback & support](#)



1 lecture

3 PI 2.0



# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classifications](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)




current session: **766079** | 69 students

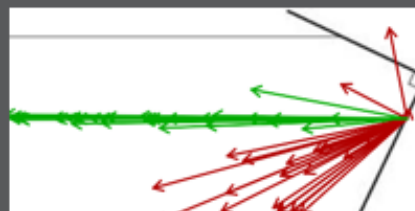
[Map](#) [Show floating session ID](#) [Edit](#) [Delete](#)

6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

[Deliver](#) [Show all results](#)

Round 1     
● 57 responses, 58% correct



 [feedback & support](#)



1 lecture

3 PI 2.0

# learning | catalytics

Courses Participate Review Classifications Purchases Users Tour Help

current session: **766079** | 69 students

Map  Show floating session ID  Edit  Delete

6 7 8 9 10 11 12 13 14 15

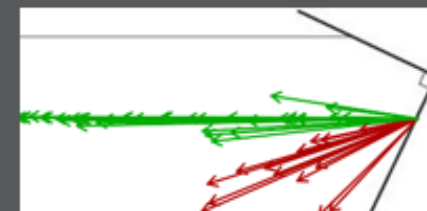
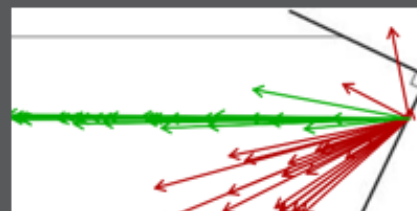


perpendicular mirrors as shown below.

Deliver  Show all results

Round 1     
● 57 responses, 58% correct

Round 2     
● 51 responses, 73% correct



✓ 8 get it now  
✗ 0 still don't get it

feedback & support



1 lectur

3 PI 2.0



**If  $2x - y = 4$ , then  $x =$**



# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classrooms](#) [Account](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

## transformations of parabolas

current session: **773885** | 9 students

[← Back to all lectures](#) [■ Stop session](#) [📊 Review results](#) [📄 Show floating session ID](#) [⚙ Edit](#) [📄 PDF](#) [✖ Delete](#)



Jump to ▾

1

2

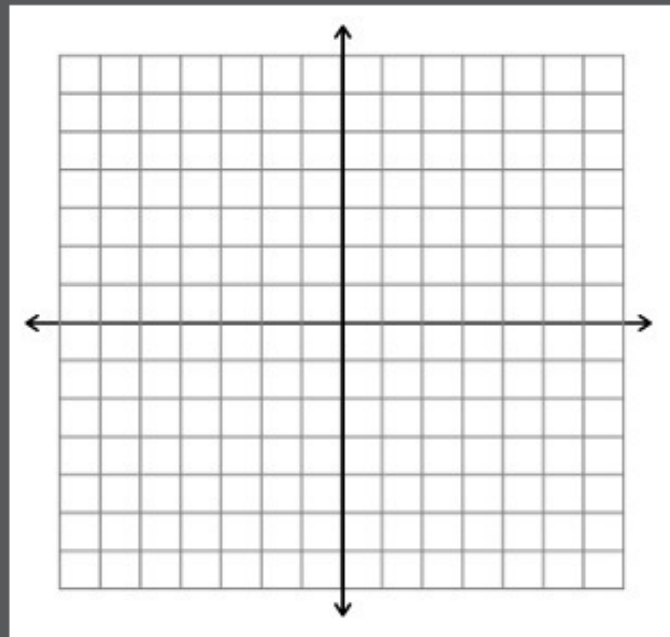
3

4



4. sketch Sketch a graph of the function  $f(x) = (x - 3)^2 + 2$ .

[✖ Stop delivery](#) [🔄 Deliver again](#) [👥 Assign groups](#) [📊 Show all results](#)



1 education

2 PI

3 PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classrooms](#) [Account](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

## transformations of parabolas

current session: **773885** | 9 students

[Back to all lectures](#) [Stop session](#) [Review results](#) [Show floating session ID](#) [Edit](#) [PDF](#) [Delete](#)



Jump to ▾

1

2

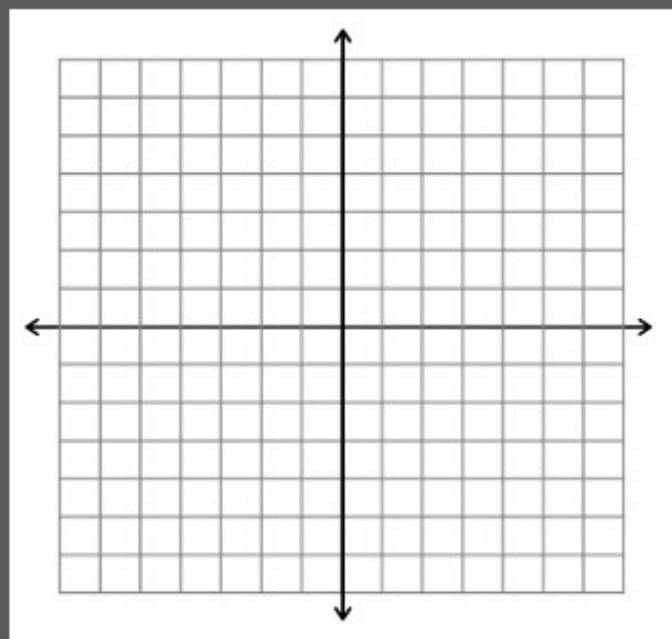
3

4



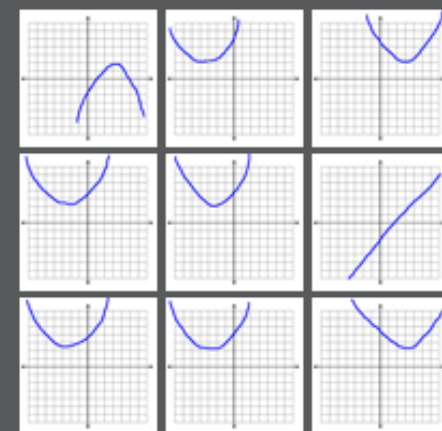
4. sketch Sketch a graph of the function  $f(x) = (x - 3)^2 + 2$ .

[Stop delivery](#) [Deliver again](#) [Assign groups](#) [Show all results](#)



Round 1

9 responses



1 education

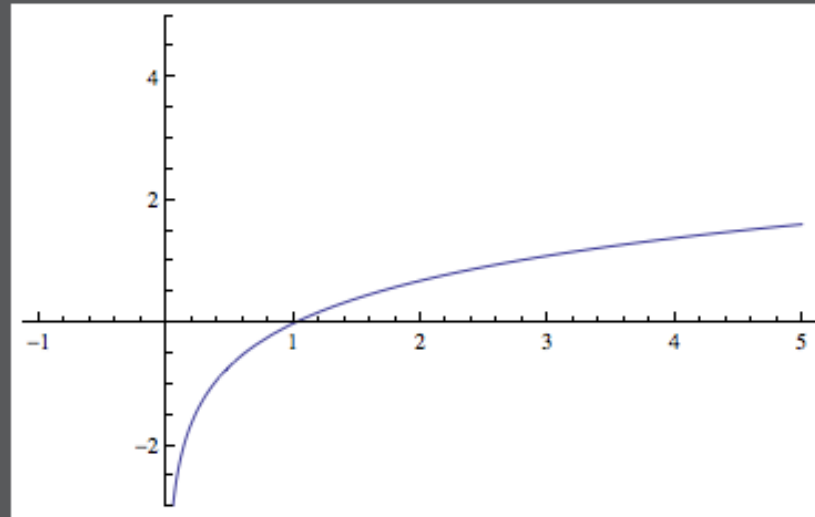
2 PI

3 PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classrooms](#) [Account](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

This is a graph of  $f(x) = \ln x$ . Sketch a graph of the derivative  $f'(x)$ .



1 education

2 PI

3 PI 2.0

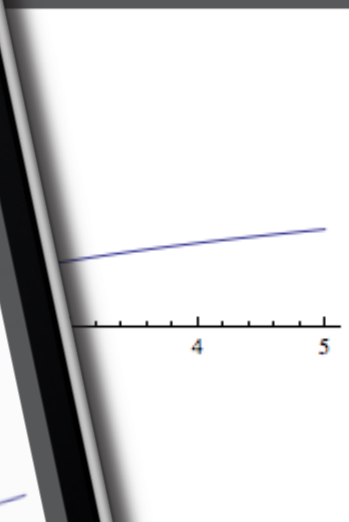


# learning | catalytics

Courses Participate

ases Users Tour Help

This is a graph of  $f(x) =$



**1** education

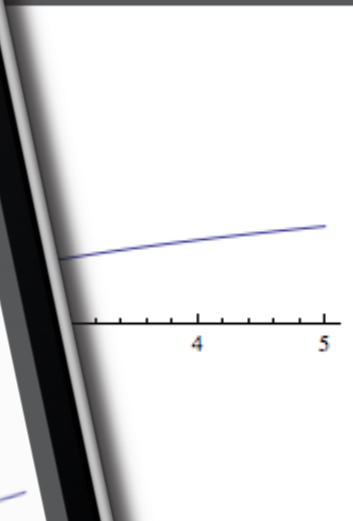
**3** PI 2.0

# learning | catalytics

Courses Participate

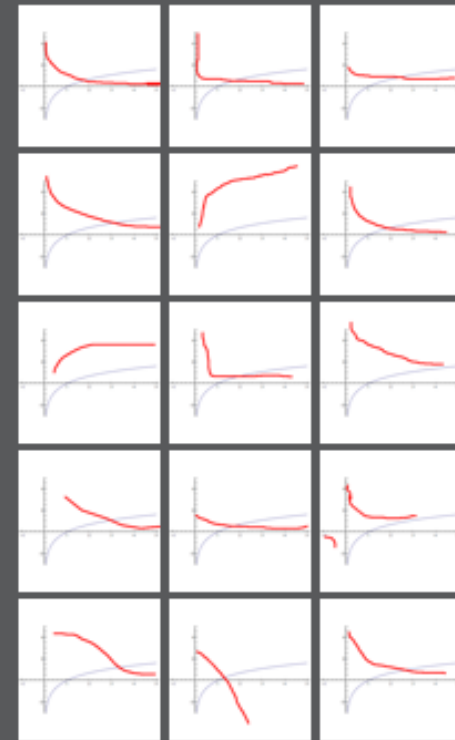
ases Users Tour Help

This is a graph of  $f(x) =$



Round 1

15 responses



✓ 6 get it now  
✗ 0 still don't get it

**1** education

**3** PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classrooms](#) [Account](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

1. highlighting What do you see as the most important part of this Shakespeare sonnet? [Stop delivery](#) [Deliver again](#) [Assign groups](#) [Show all results](#)

For shame! deny that thou bear'st love to any,  
Who for thyself art so unprovident.  
Grant, if thou wilt, thou art beloved of many,  
But that thou none lovest is most evident;  
For thou art so possess'd with murderous hate  
That 'gainst thyself thou stick'st not to conspire.  
Seeking that beauteous roof to ruinate  
Which to repair should be thy chief desire.  
O, change thy thought, that I may change my mind!  
Shall hate be fairer lodged than gentle love?  
Be, as thy presence is, gracious and kind,  
Or to thyself at least kind-hearted prove:  
Make thee another self, for love of me,  
That beauty still may live in thine or thee.

1 education

2 PI

3 PI 2.0



# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classroom](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

1. highlighting  
sonnet?

this Shakespeare

[Stop delivery](#)

[Deliver again](#)

[Assign groups](#)

[Show all results](#)



For shame  
Who for t  
Grant, if t  
But that th  
For thou a  
That 'gainst  
Seeking that  
Which to rep  
O, change th  
Shall hate be  
Be, as thy pres  
Or to thyself a  
Make thee ano  
That beauty stil

What do you see as the most important part of this Shakespeare sonnet?

**Highlight the passage below by clicking or tapping once to set the beginning of your highlight, and then clicking or tapping again to set the end.**

For shame! deny that thou bear'st love to any,  
Who for thyself art so unprovident.  
Grant, if thou wilt, thou art beloved of many,  
But that thou none lovest is most evident;  
For thou art so possess'd with murderous hate  
That 'gainst thyself thou stick'st not to  
conspire.

Seeking that beauteous roof to ruinate  
Which to repair should be thy chief desire.  
O, change thy thought, that I may change my  
mind

1 educa

3 PI 2.0

# learning | catalytics

[Courses](#) [Participate](#) [Review](#) [Classroom](#) [Institutions](#) [Purchases](#) [Users](#) [Tour](#) [Help](#)

1. highlighting  
sonnet?

[his Shakespeare](#) [Stop delivery](#) [Deliver again](#) [Assign groups](#) [Show all results](#)



**Round 1**   
● 3 responses

For shame! deny that thou bear'st  
love to any,  
Who for thyself art so  
unprovident.  
Grant, if thou wilt, thou art  
beloved of many,  
But that thou none lovest is most  
evident;  
For thou art so possess'd with  
murderous hate  
That 'gainst thyself thou stick'st  
not to conspire.  
**Seeking that beauteous roof to  
ruinate**  
Which to repair should be thy  
chief desire.  
O, change thy thought, that I may  
change my mind!  
Shall hate be fairer lodged than  
gentle love?  
Be, as thy presence is, gracious  
and kind,

## Sample question types:

- direction
- expression
- long answer, short answer, word cloud (fill in text)
- multiple choice, many choice
- numerical (enter a number)
- ranking
- region (select point on image)
- sketch

**data analytics**





**1** lecture

**2** PI

**3** PI 2.0





# human interaction

1 lecture

2 PI

3 PI 2.0

Carrier 9:31 PM learning catalytics skywalker.seas.harvard.edu/class\_sessions/399757/review\_results Google Eric Mazur | Harvard University | Log out

# learning | catalytics

Courses Participate Review Classrooms Account Institutions Users About

## review results for session 399757 in electrostatic work and energy ii

Back to all lectures Download all results Jump to 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Round 1 74 responses, 61% correct

A. 61%
B. 4%
C. 35%
D. 0%
E. 0%

Round 2 75 responses, 83% correct

A. 83%
B. 0%
C. 17%
D. 0%
E. 0%

A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B



A. positive  
B. zero  
C. negative  
D. depends on the path taken from A to B  
E. cannot be determined without knowing more about the polarization induced in the sphere

Search: \_\_\_\_\_

1 lecture

2 PI

3 PI 2.0



Carrier 9:31 PM learning catalytics skywalker.seas.harvard.edu/class\_sessions/399757/review\_results Google Eric Mazur | Harvard University | Log out

# learning catalytics





A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B as illustrated below.



A. positive  
 B. zero  
 C. negative  
 D. depends on the path taken from A to B  
 E. cannot be determined without knowing more about the polarization induced in the sphere

**Round 1**  
 74 responses, 61% correct

A. 61%  
 B. 4%  
 C. 35%  
 D. 0%  
 E. 0%

**Round 2**  
 75 responses, 83% correct

A. 83%  
 B. 0%  
 C. 17%  
 D. 0%  
 E. 0%

Search: \_\_\_\_\_

1 lecture

2 PI

3 PI 2.0

Carrier 9:31 PM learning catalytics skywalker.seas.harvard.edu/class\_sessions/399757/review\_results Google Eric Mazur | Harvard University | Log out

# learning | catalytics

Courses Participate Review Classrooms Account Institutions Users About

## review results for session 399757 in electrostatic work and energy ii

Back to all lectures Download all results Jump to 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Round 1 74 responses, 61% correct

A. 61%
B. 4%
C. 35%
D. 0%
E. 0%

Round 2 75 responses, 83% correct

A. 83%
B. 0%
C. 17%
D. 0%
E. 0%

A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B



A. positive  
B. zero  
C. negative  
D. depends on the path taken from A to B  
E. cannot be determined without knowing more about the polarization induced in the sphere

Search: \_\_\_\_\_

1 lecture

2 PI

3 PI 2.0



Carrier 9:31 PM learning catalytics skywalker.seas.harvard.edu/class\_sessions/399757/review\_results Google Eric Mazur | Harvard University | Log out

# learning catalytics

A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B. The potential difference from A to B is

A. positive  
 B. zero  
 C. negative  
 D. depends on the path taken from A to B  
 E. cannot be determined without knowing more about the polarization induced in the sphere

**Round 1**  
 74 responses, 61% correct

A. 61%  
 B. 4%  
 C. 35%  
 D. 0%  
 E. 0%

**Round 2**  
 75 responses, 83% correct

A. 83%  
 B. 0%  
 C. 17%  
 D. 0%  
 E. 0%

Search: \_\_\_\_\_

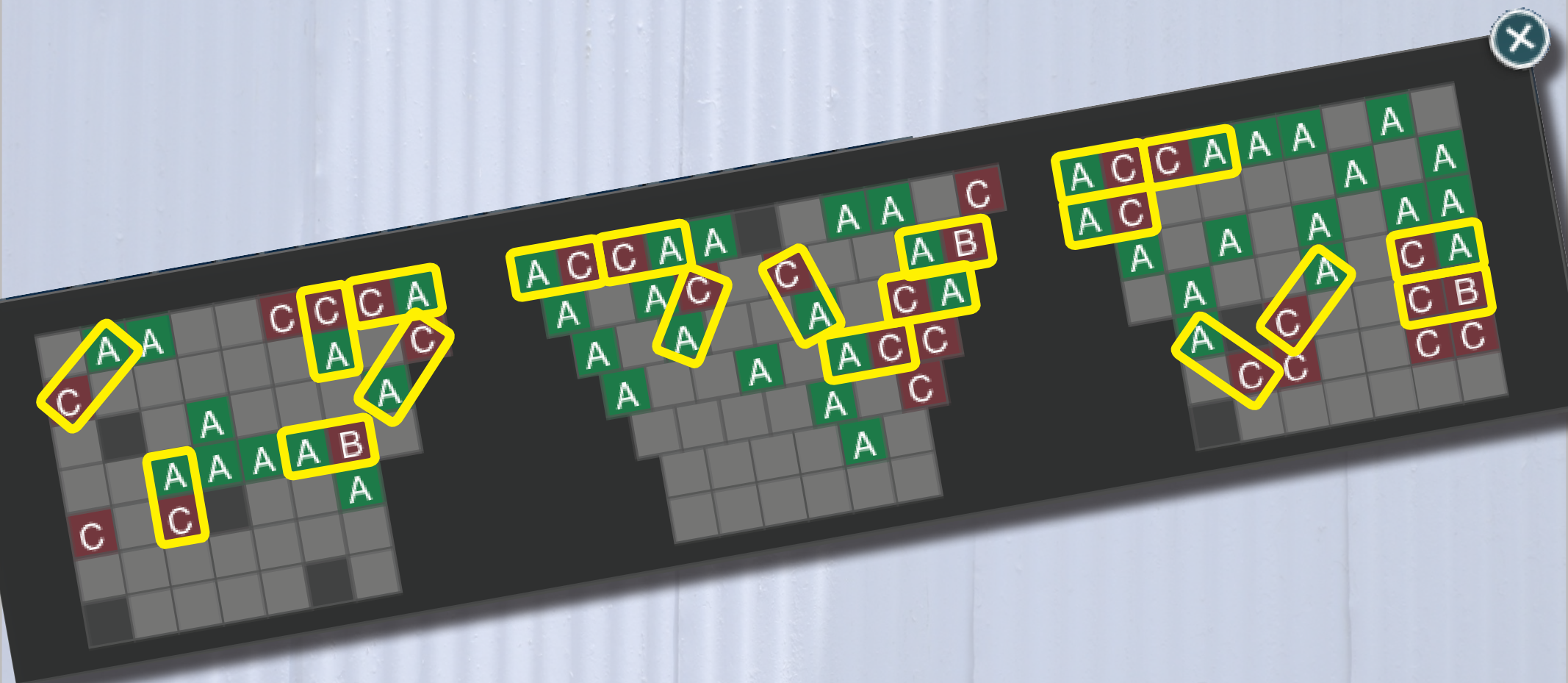
1 lecture

2 PI

3 PI 2.0



let system manage pairing



1 lecture

2 PI

3 PI 2.0



Leave

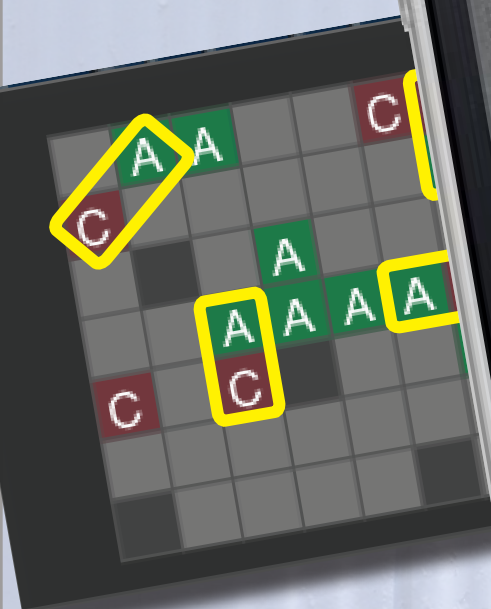
A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B at constant speed. The mechanical work required to cause this motion is



Please discuss your response with:

- Brian Lukoff (to your left)

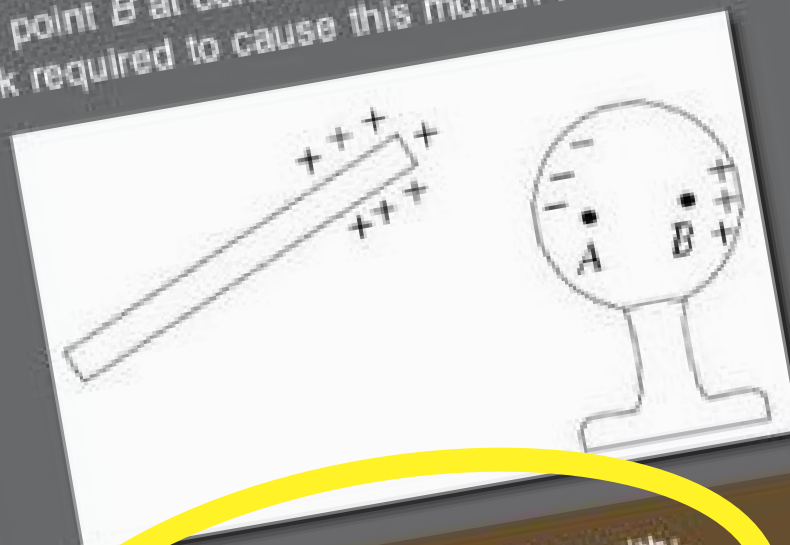
I am talking to this person/people





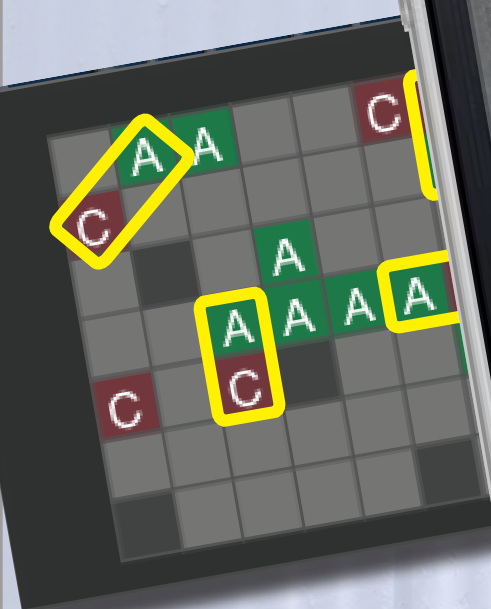
Leave

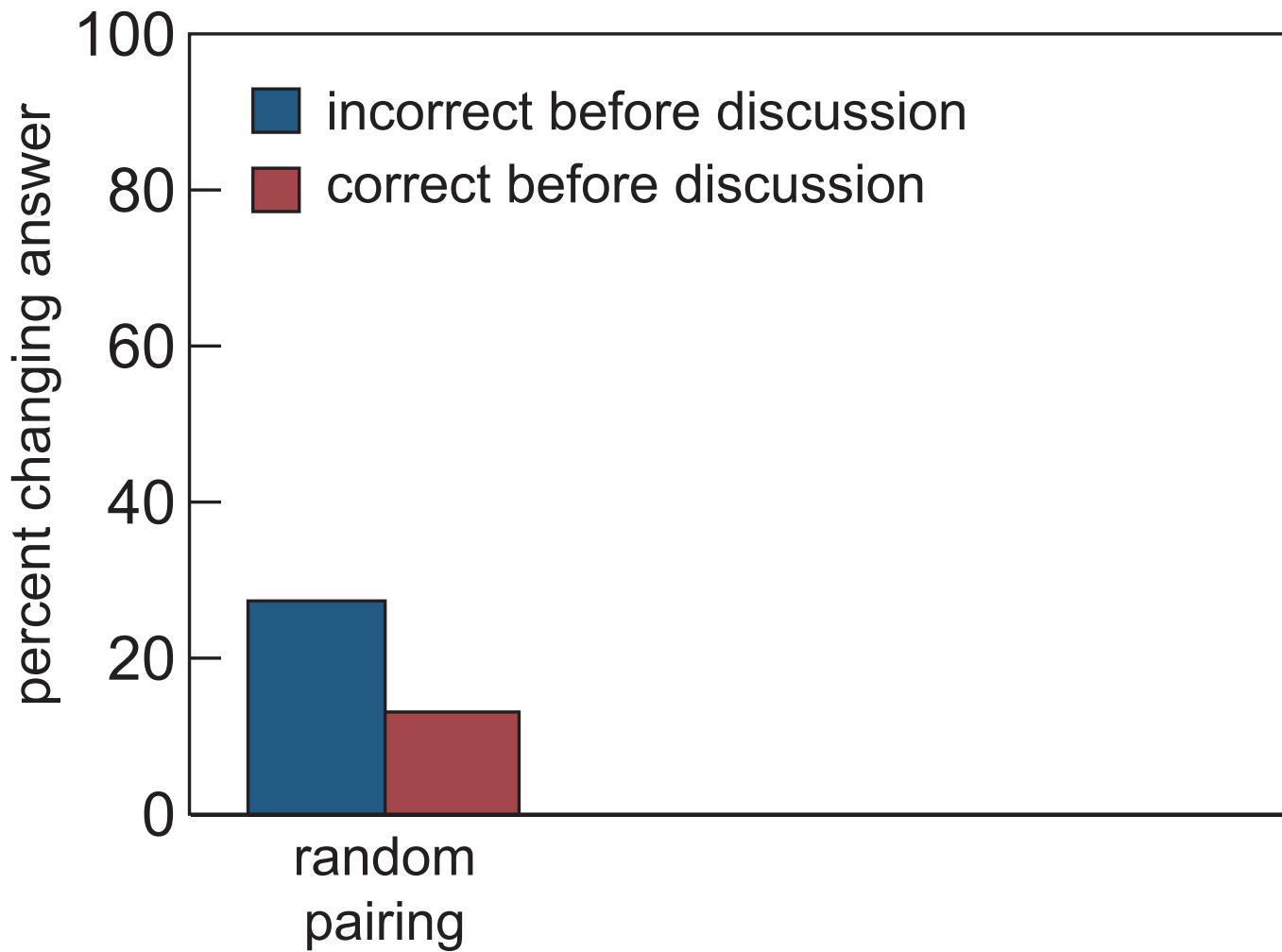
A positively charged rod is held near a neutral conducting sphere as illustrated below. A positively charged particle is moved from point A to point B at constant speed. The mechanical work required to cause this motion is

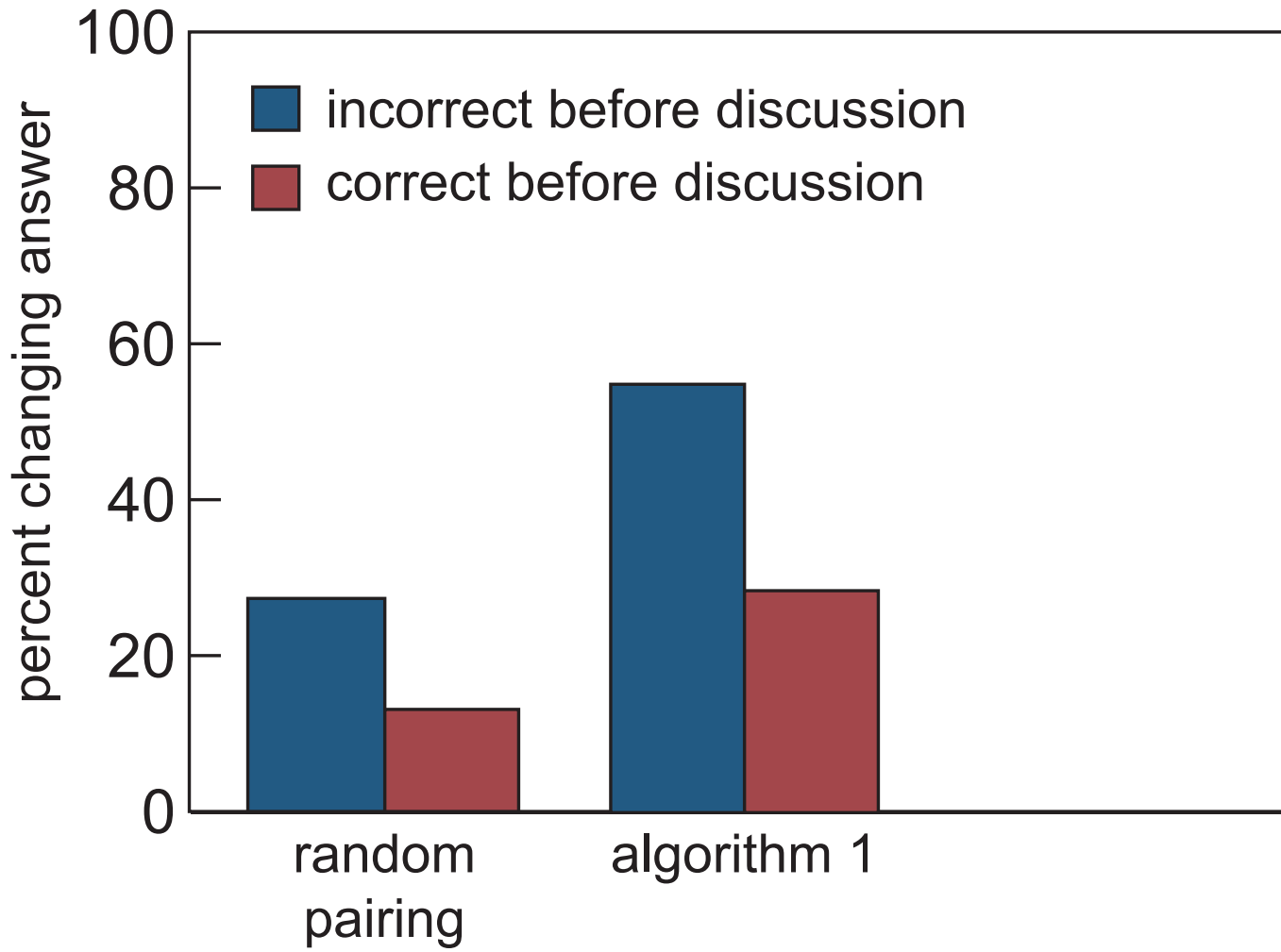


Please discuss your response with:

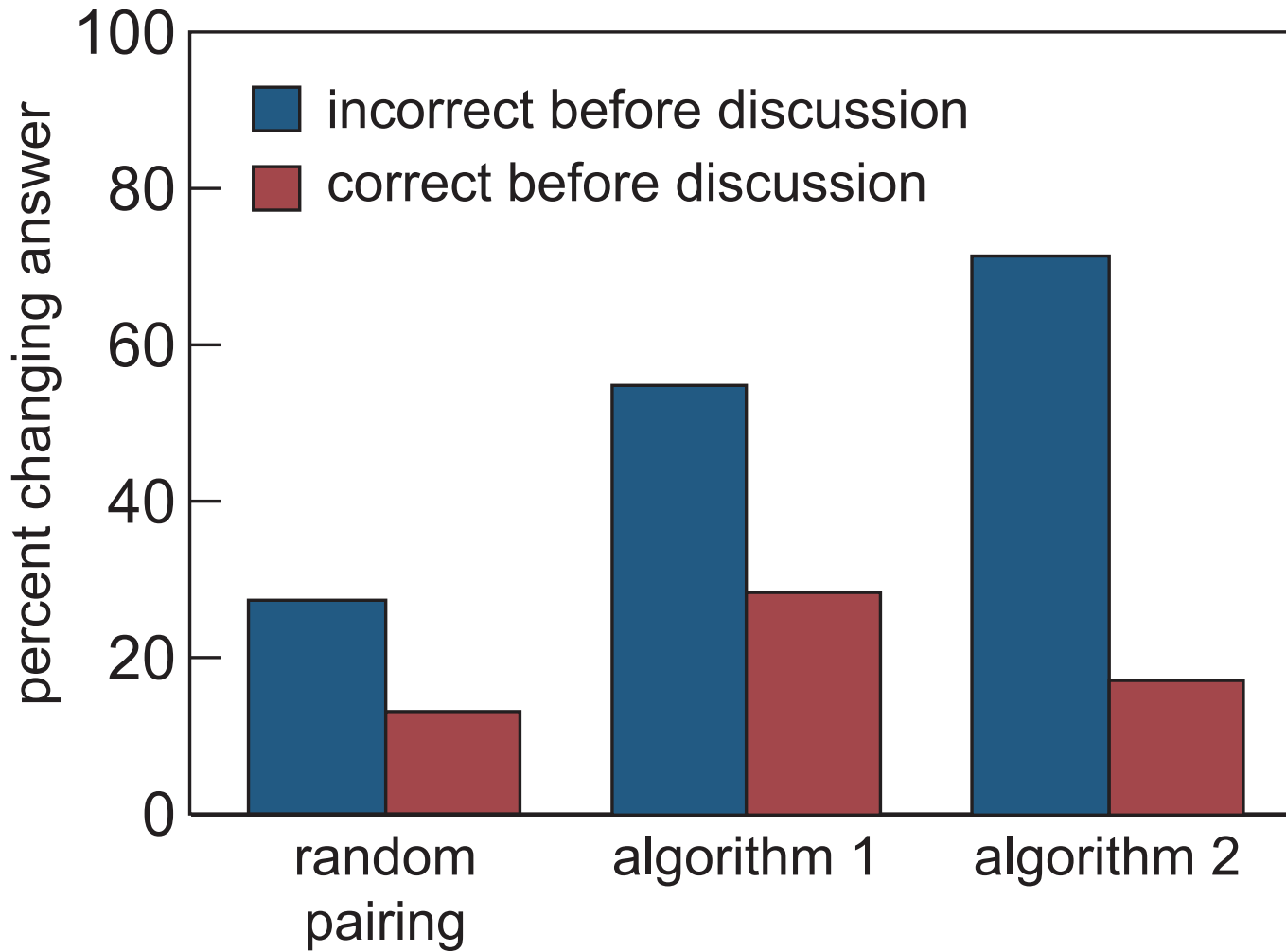
- Brian Lukoff (to your left)













**1** education

**2** PI

**3** PI 2.0





## Learning Catalytics:

- implement proven, researched pedagogy



## Learning Catalytics:

- implement proven, researched pedagogy
- use consumer devices

## **Learning Catalytics:**

- **implement proven, researched pedagogy**
- **use consumer devices**
- **avoid pitfalls of MC assessment**



## Learning Catalytics:

- implement proven, researched pedagogy
- use consumer devices
- avoid pitfalls of MC assessment
- create a smart classroom *anywhere*



For a copy of these slides:

[ericmazur.com](http://ericmazur.com)

[pearson.com.au/MazurMoreInfo](http://pearson.com.au/MazurMoreInfo)

Follow me!



[eric\\_mazur](https://twitter.com/eric_mazur)