1. Go to http://LCatalytics.com

2a. If you have instructor account: Log in, click “Student view”

2b. Otherwise: Create student account with signup code DEMO

3. Join session 1234567
Think of something you are good at
Now think how you became good at it
EXCITING stuff!
What happens in a lecture?
some people talk in their sleep
some people talk in their sleep

lecturers talk while other people are sleeping

(Albert Camus)
1 lecture
lecture
lecture
The result?
Lack of learning
Lack of learning
Lack of retention
lecture

PI
1. transfer of information
1. transfer of information

2. assimilation of that information
1. transfer of information (in class)

2. assimilation of that information
1. transfer of information (in class)

2. assimilation of that information (out of class)
1. transfer of information (in class)

2. assimilation of that information (out of class)

Should focus on THIS!
1. transfer of information (in class)

2. assimilation of that information (out of class)
1. transfer of information (out of class)

2. assimilation of that information (in class)
1. transfer of information (out of class)

2. assimilation of that information (in class)
question
question

think
question
→
think
→
poll
lecture

Think

Poll

Discuss

Repoll
lecture

PI
lecture

1. question
2. think
3. poll
4. discuss
5. repoll
6. explain
Let's try it!
thermal expansion
lecture

PI
all of them
Consider a rectangular metal plate with a circular hole in it.
Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole

1. increases.
2. stays the same.
3. decreases.
Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole

1. increases.
2. stays the same.
3. decreases.
Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole

1. increases.
2. stays the same.
3. decreases.
Before I tell you the answer, let’s analyze what happened.
Before I tell you the answer, let’s analyze what happened.

You...
Before I tell you the answer, let’s analyze what happened.

You...

1. made a commitment
Before I tell you the answer, let’s analyze what happened.

You...

1. made a commitment
2. externalized your answer
Before I tell you the answer, let’s analyze what happened.

You...

1. made a commitment
2. externalized your answer
3. moved from the answer/fact to reasoning
Before I tell you the answer, let’s analyze what happened.

You...

1. made a commitment
2. externalized your answer
3. moved from the answer/fact to reasoning
4. became emotionally invested in the learning process
Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole

1. increases.
2. stays the same.
3. decreases.
Consider a rectangular metal plate with a circular hole in it.

When the plate is uniformly heated, the diameter of the hole

1. increases. ✓
2. stays the same.
3. decreases.
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole

you won’t forget this
Peer back to PI
Higher learning gains
Better retention leads to higher learning gains.
feedback
lecture 2008 PI 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
Use intelligent algorithms and data analytics to...

- improve questioning
- manage discussions
- facilitate time management/flow
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. 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 would 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. a marketing plan
C. funding
D. depreciation
1. A 30-year fixed rate mortgage at 12%
2. A 15-year fixed rate mortgage at 12%
3. A 15-year fixed rate mortgage at 12%
4. A 15-year fixed rate mortgage at 12%
5. The biggest factor that leads American companies to manufacture their products overseas is:
   a. Higher quality of craftsmanship
   b. Effective legal systems
   c. Decreased transportation costs
   d. Lower labor costs
6. What is the following correctly summarizes the accounting equation for a sole proprietorship?
   a. Assets = Liabilities + Owners’ equity
   b. Owner’s equity = Assets + Liabilities
   c. Revenue = Assets – Liabilities
   d. Assets = Liabilities + Owners’ equity
7. 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
8. In order to start an online business, an individual would need all but which of the following:
   a. Website
   b. Business plan
   c.-Credit card
   d. Domain name
9. Lecture
10. PI
11. PI 2.0
12. extensible plug-in architecture for question types

extensible plug-in architecture for question types
Sample question types:

- direction
- mathematical expression
- long answer, short answer, word cloud
- numerical, data collection
- ranking, priority
- region (select point on image)
- sketch, composite sketch
- highlight passage
Sample question types:

- **direction**
- **mathematical expression**
- **long answer, short answer, word cloud**
- **numerical, data collection**
- **ranking, priority**
- **region (select point on image)**
- **sketch, composite sketch**
- **highlight passage**
This image shows Oahu as seen from the Space Shuttle. The image provides several clues about the direction of prevailing winds in Oahu. Indicate this direction by drawing an arrow on your screen.
This image shows Oahu as seen from the Space Shuttle. The image provides several clues about the direction of prevailing winds in Oahu. Indicate this direction by drawing an arrow on your screen.
Optics I

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

Indicate the direction of the incident light after it reflects off both mirrors.
Light enters horizontally into the combination of two perpendicular mirrors as shown below. Indicate the direction of the incident light after it reflects off of both mirrors.
Light enters horizontally into the combination of two perpendicular mirrors as shown below. Indicate the direction of the incident light after it reflects off of both mirrors.
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Light enters horizontally into the combination of two perpendicular mirrors as shown below. Indicate the direction of the incident light after it reflects off of both mirrors.

Submit response

Switch to text response
Sample question types:
- direction
- mathematical expression
- long answer, short answer, word cloud
- numerical, data collection
- ranking, priority
- region (select point on image)
- sketch, composite sketch
- highlight passage
If $2x - y = 4$, then $x =$
Sample question types:

- direction
- mathematical expression
- long answer, short answer, word cloud
- numerical, data collection
- ranking, priority
- region (select point on image)
- sketch, composite sketch
- highlight passage
This is a graph of \( f(x) = \ln x \). Sketch a graph of the derivative \( f'(x) \).
This is a graph of $f(x) = \ln x$. Sketch a graph of the derivative $f'(x)$. 

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

This is a graph of $f(x) = \ln x$. Sketch a graph of the derivative $f'(x)$.
This is a graph of \( f(x) = \ln x \). Sketch a graph of the derivative \( f'(x) \).
Sample question types:
• direction
• mathematical expression
• long answer, short answer, word cloud
• numerical, data collection
• ranking, priority
• region (select point on image)
• sketch, composite sketch
• highlight passage
• region (select point on image)
• data analytics
PART ABOUT TIME/FLOW MANAGEMENT
human interaction
1. lecture

2. PI

3. PI 2.0

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 at constant speed. 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 sphera

Round 1
- 75 responses, 61% correct
  A. 51%
  B. 4%
  C. 35%
  D. 0%
  E. 0%

Round 2
- 75 responses, 83% correct
  A. 93%
  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 at constant speed. The potential difference from A to B is

A. positive
B. zero
C. negative
D. depends on the path taken from A to B

A cannot be determined without knowing more about the polarization induced in the sphere.
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 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.
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 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.
let system manage pairing
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...
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
percent changing answer

- Initially incorrect
- Initially correct

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<th>self pairing</th>
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</tr>
</tbody>
</table>

1 education
2 PI
3 PI 2.0
Education is not just about:

• transferring information

• getting students to do what we do
Education is not just about:

- transferring information

- getting students to do what we do

discovery & exploration a must!
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
Funding:

National Science Foundation

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