

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

Peer Instruction



FCIS Convention
Orlando, FL, November 8, 2013

Peer Instruction



@eric_mazur



FCIS Convention
Orlando, FL, November 8, 2013

ERIC MAZUR

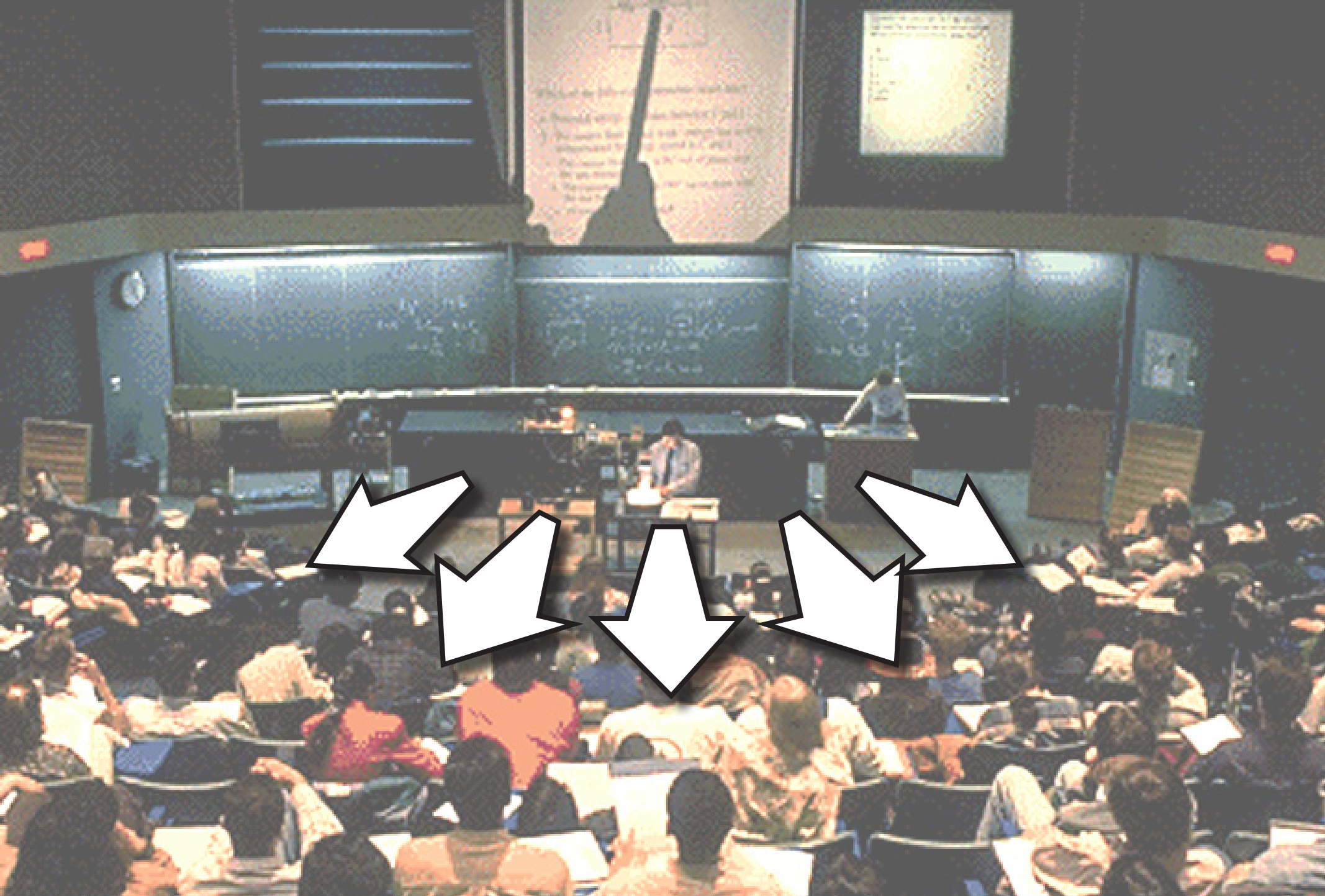


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1. transfer of information



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)



**Should focus
on THIS!**

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)**

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

A photograph of a male lecturer in a grey checkered suit and red tie leaning over a group of female students in a lecture hall. The students are seated in green plastic chairs with attached writing tablets. The lecturer is pointing at a notebook held by one of the students. In the background, other students are visible, some looking at their phones. The text '1. transfer of information (out of class)' is overlaid on the image.

1. transfer of information (out of class)

2. assimilation of that information (in class)



Peer

INSTRUCTION

1 lecture

2 PI

Speak

speak



question

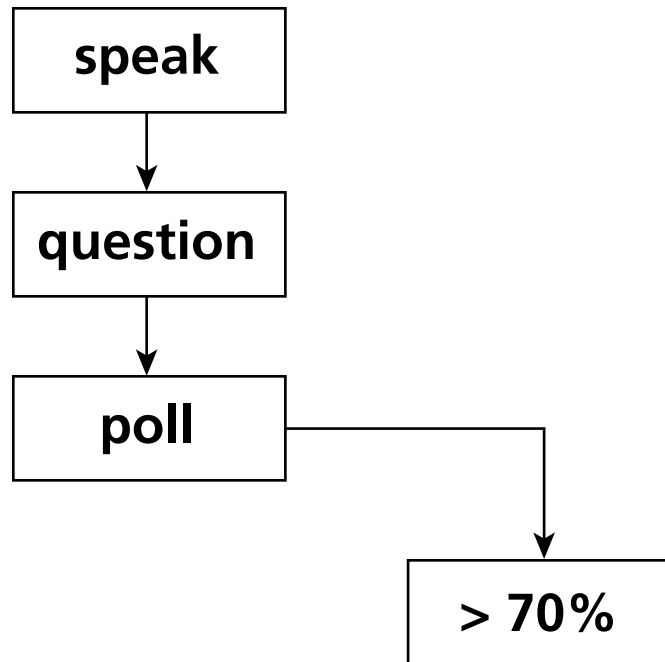
speak

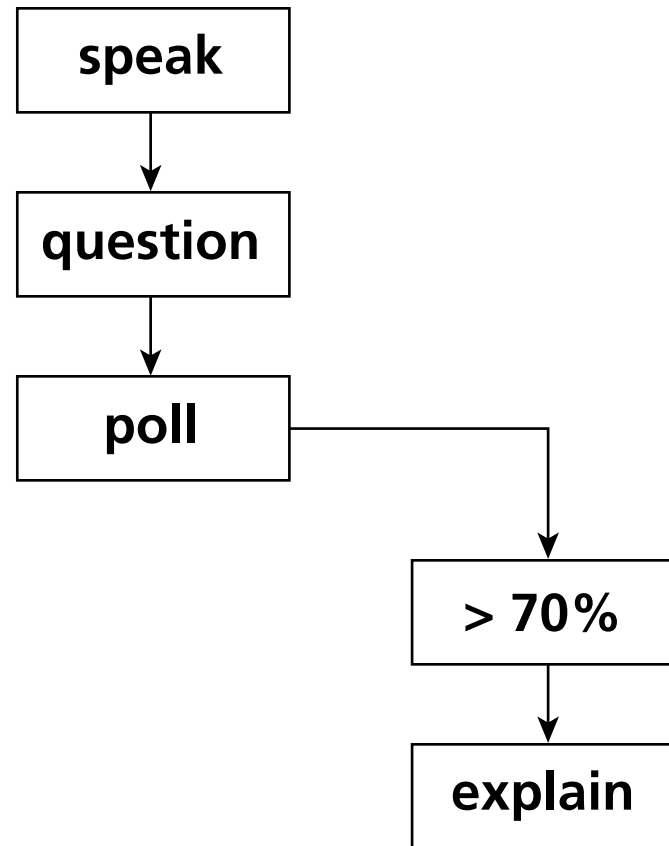


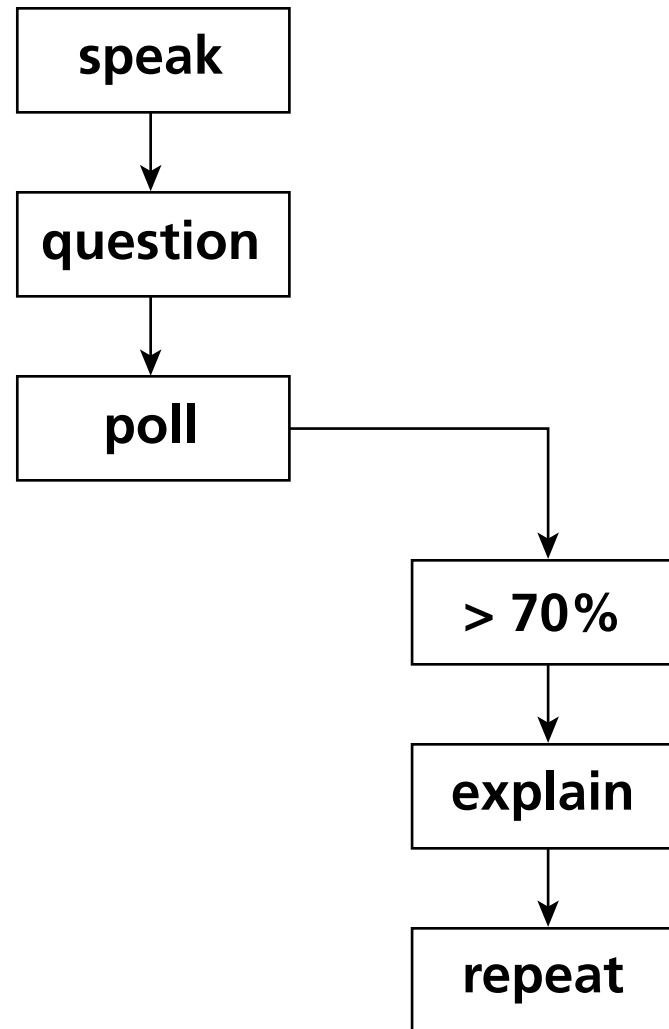
question

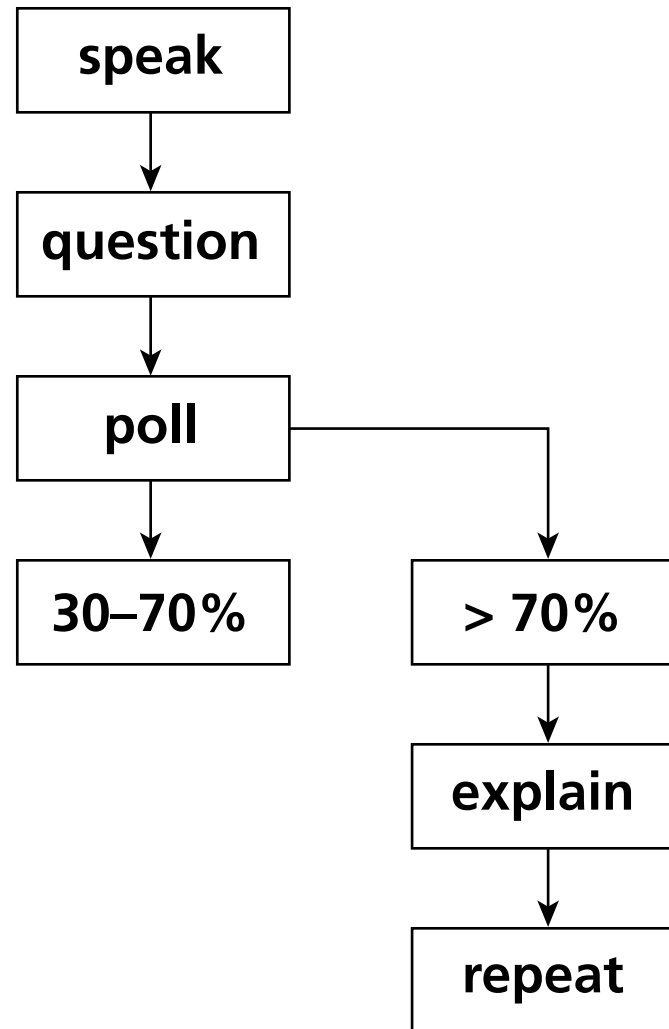


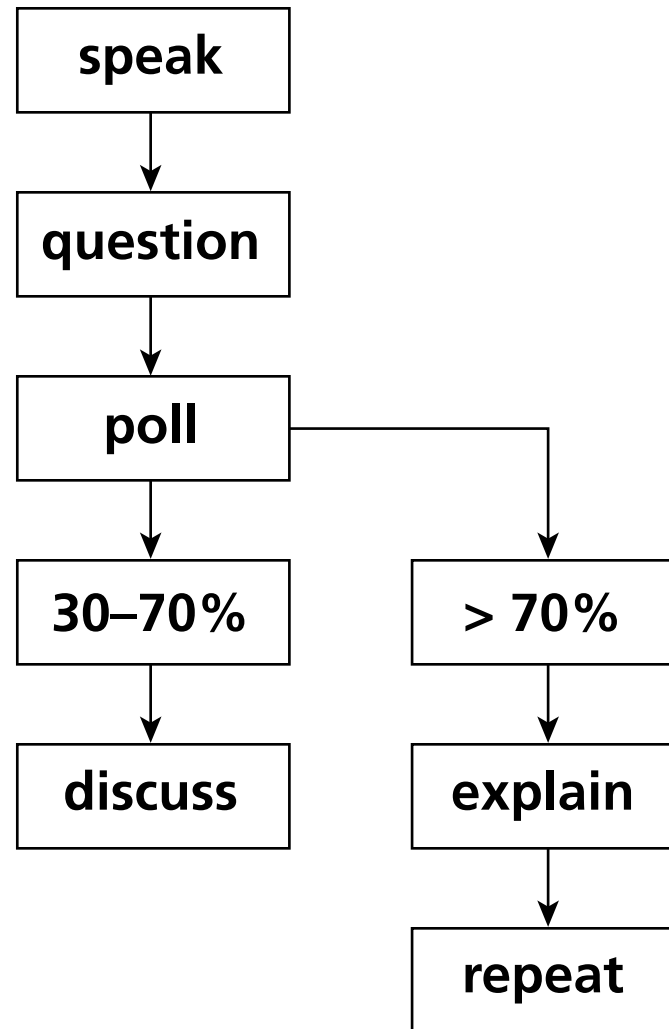
poll

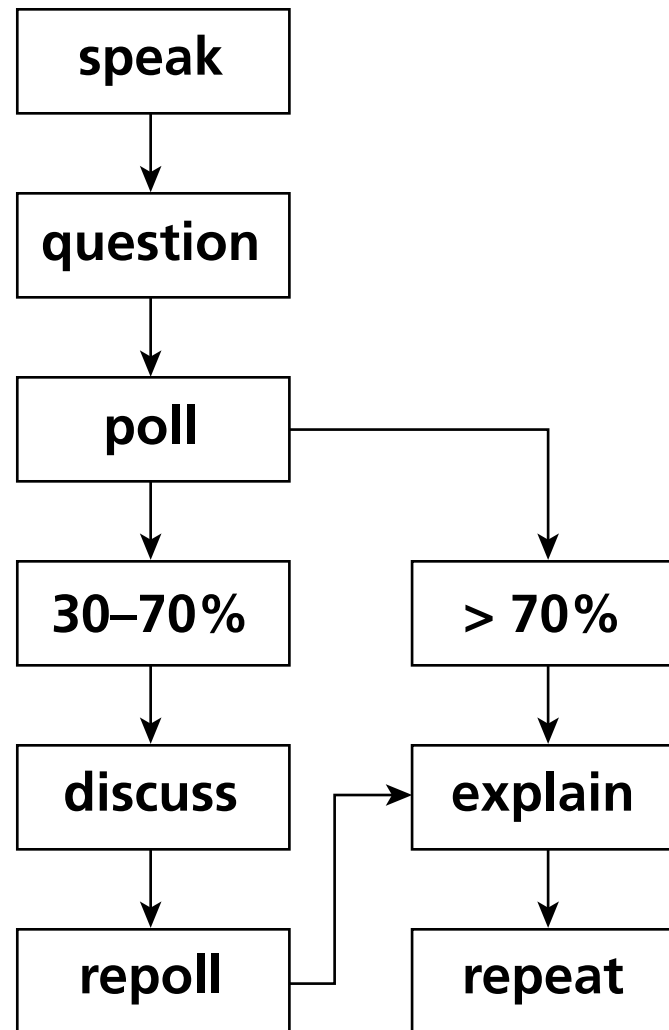


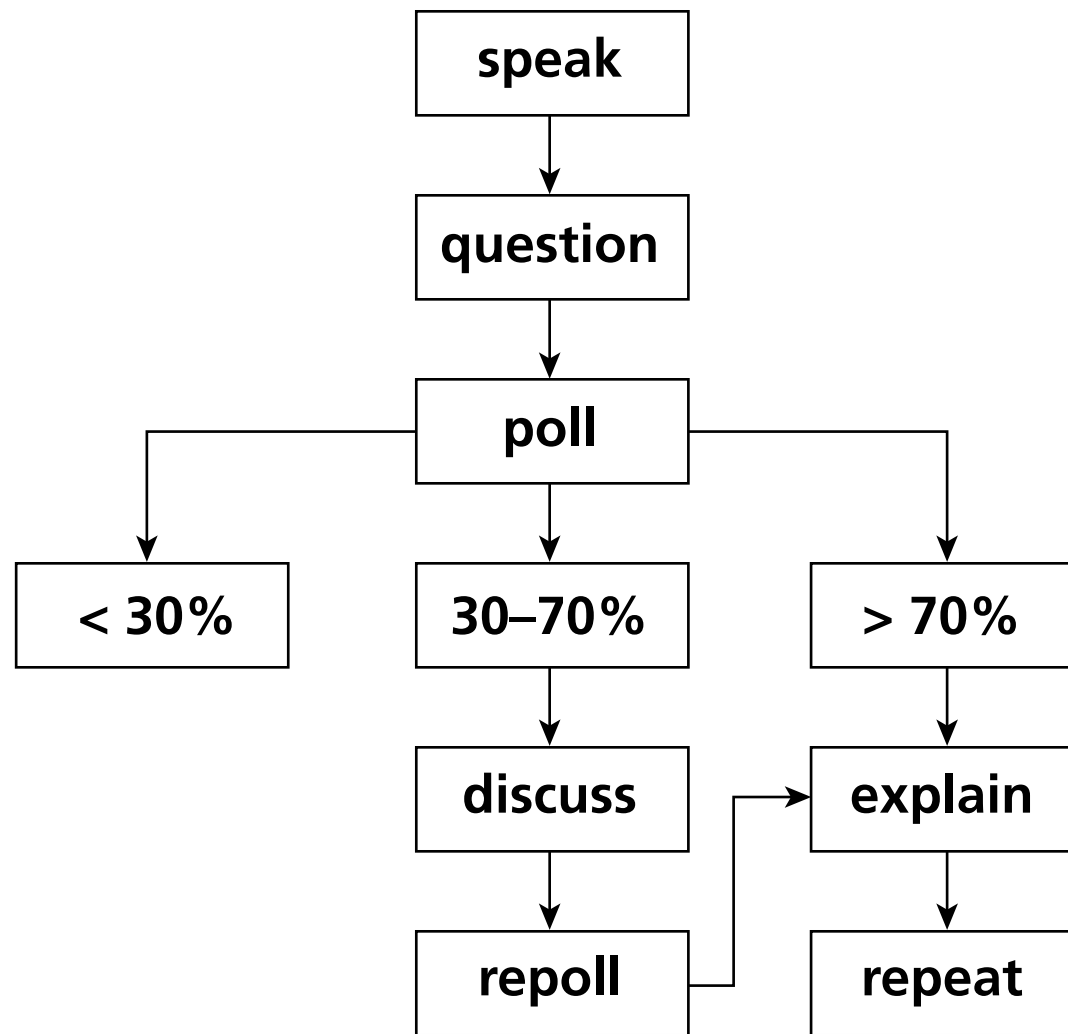


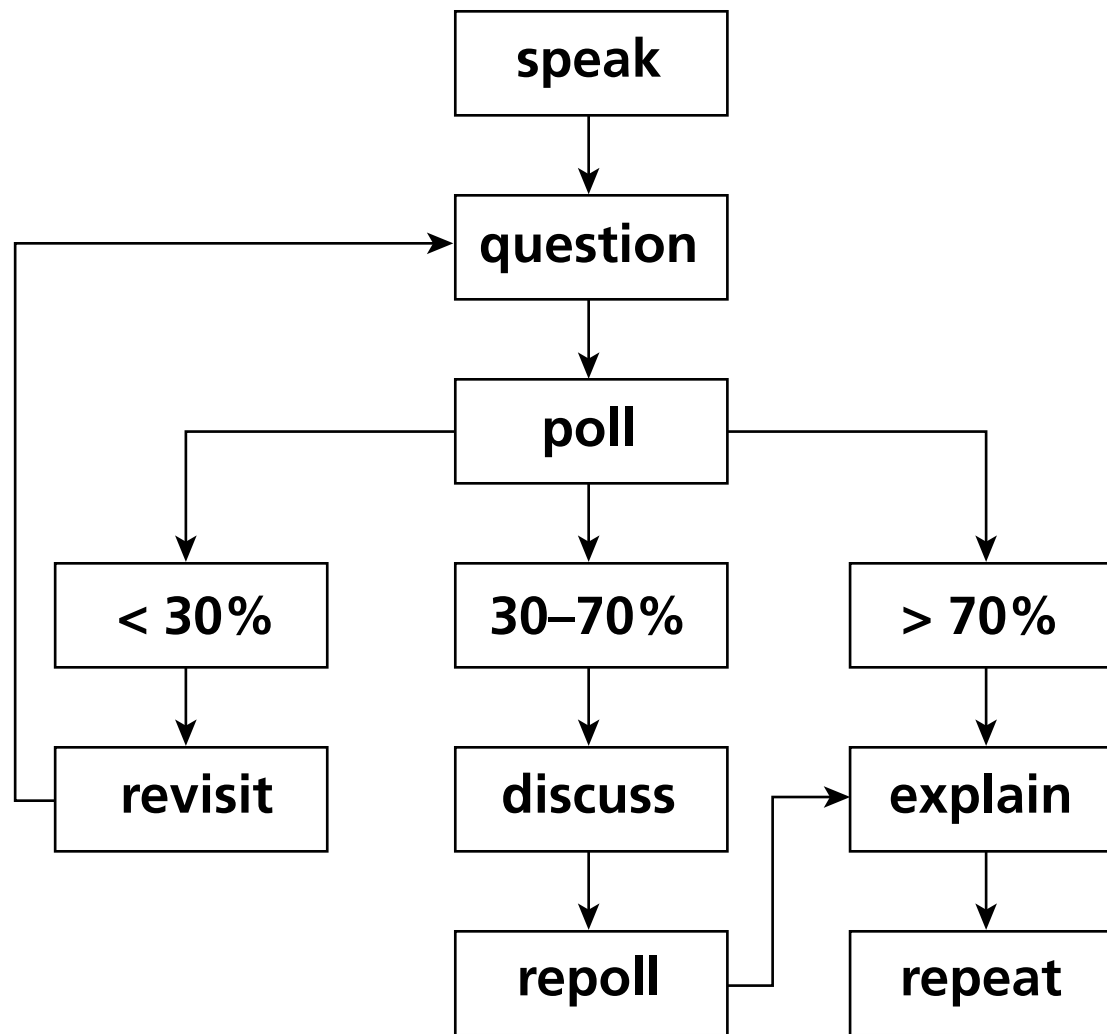


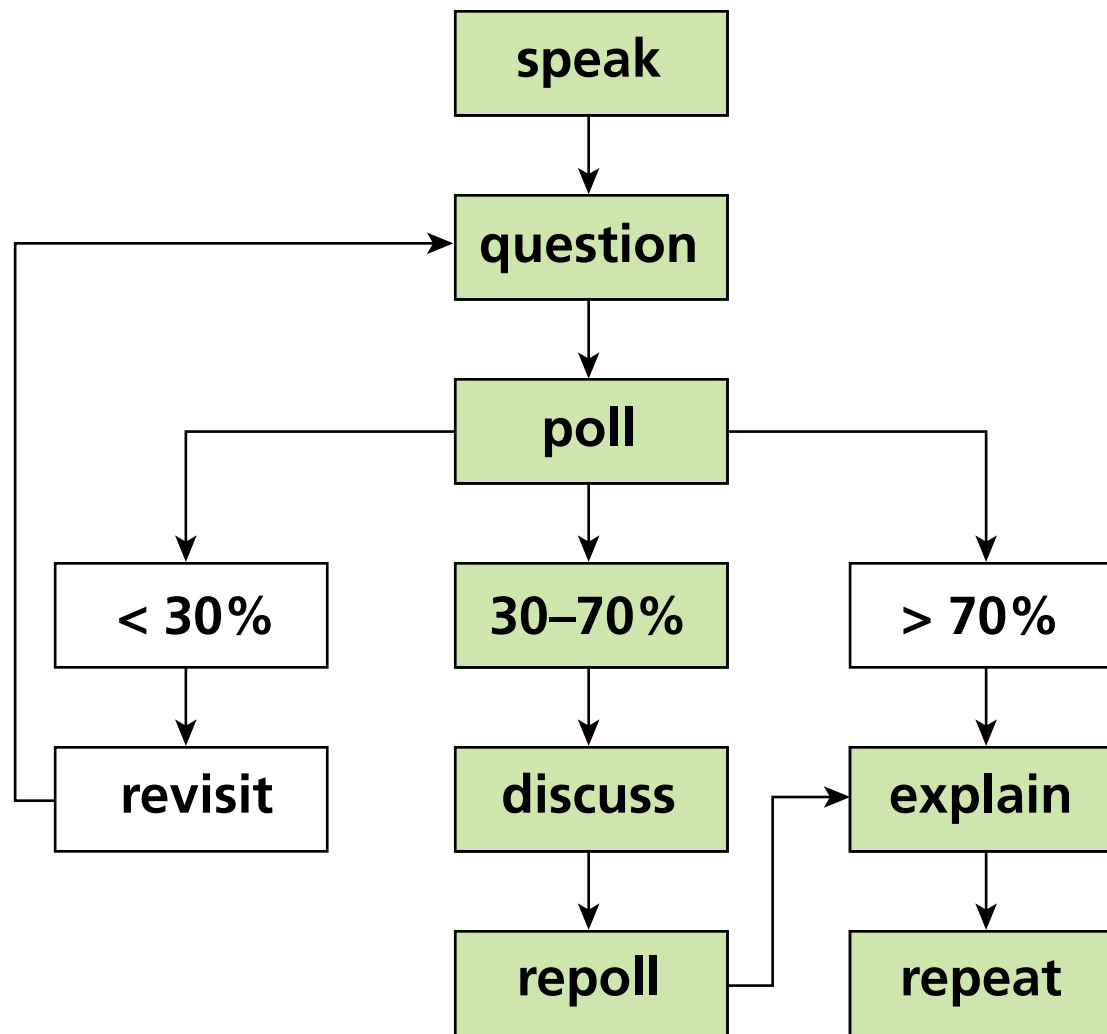














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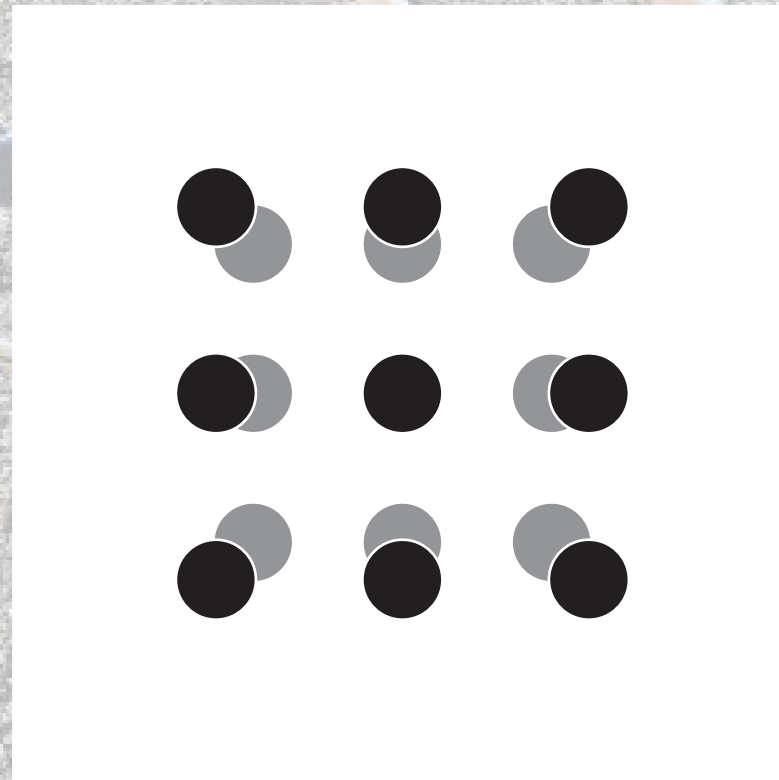
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An aerial photograph of a railway track that has been laid out in a series of sharp, wavy curves. The track is composed of metal rails and wooden sleepers, resting on a thick bed of dark gravel. The surrounding area is covered in green grass. The text "thermal expansion" is written in a bold, black, sans-serif font across the middle of the track, illustrating the concept of thermal expansion in engineering.

thermal expansion





all of them



**Consider a rectangular metal plate
with a circular hole in it.**



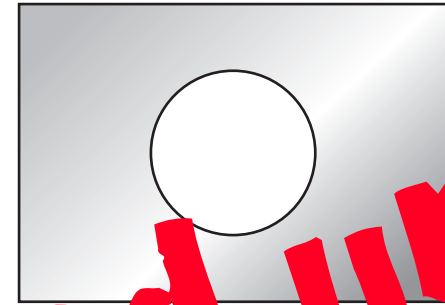
Consider a rectangular metal plate with a circular hole in it.



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.

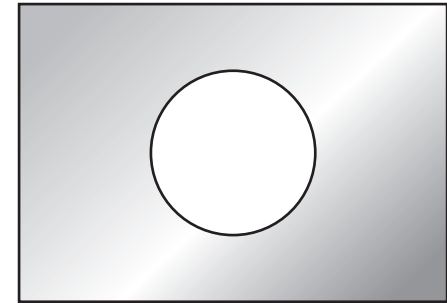


When the plate is uniformly heated, the diameter of the hole

1. increases.
2. stays the same.
3. decreases.

you got all fired up!

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.**

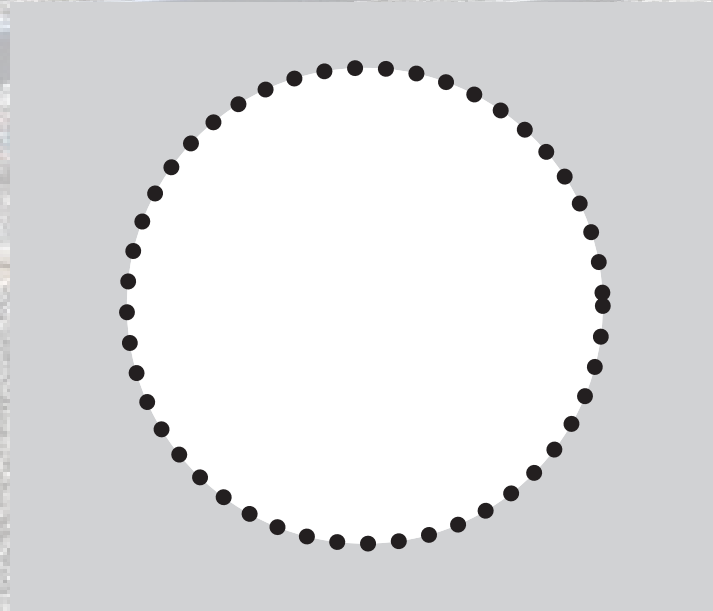
Consider a rectangular metal plate with a circular hole in it.



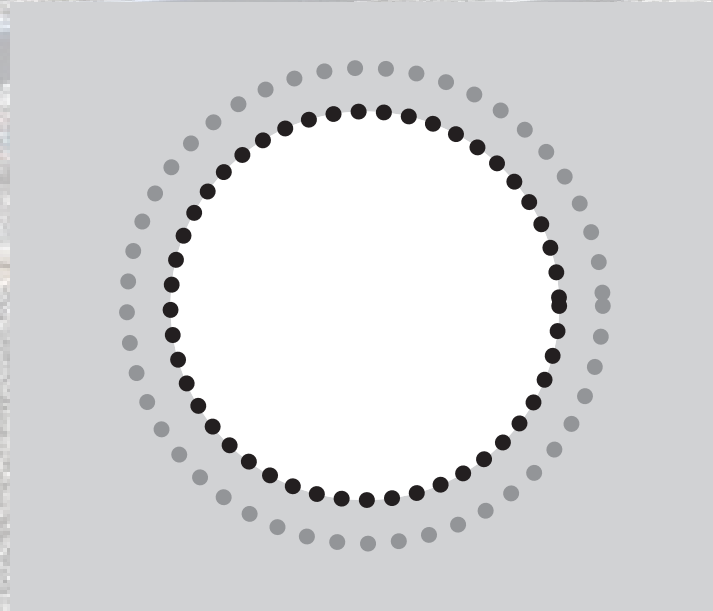
When the plate is uniformly heated, the diameter of the hole

- 1. increases. ✓**
- 2. stays the same.
- 3. decreases.

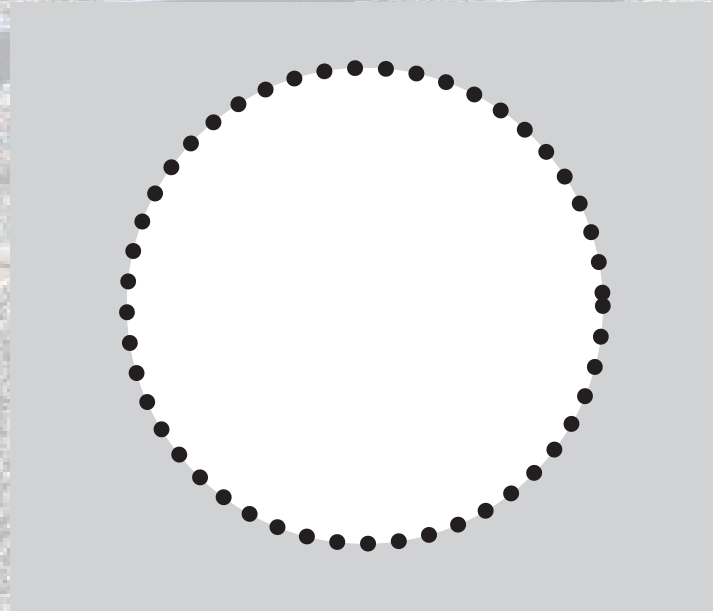
consider atoms at rim of hole



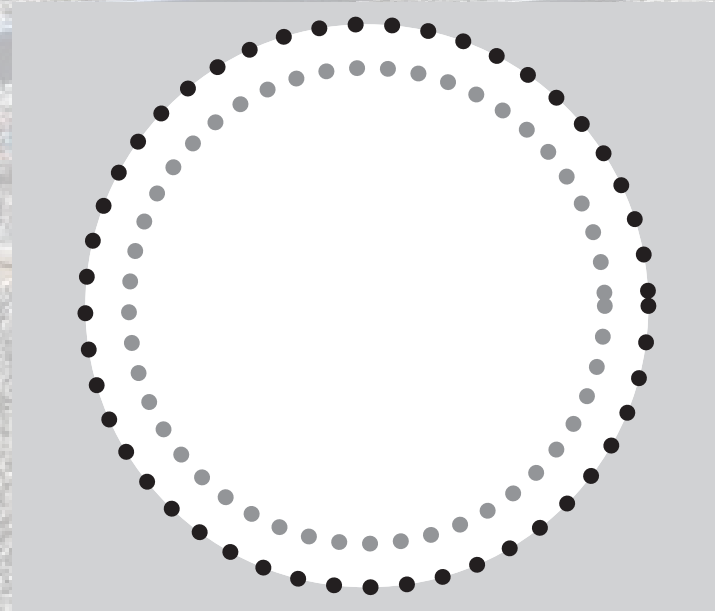
consider atoms at rim of hole



consider atoms at rim of hole



consider atoms at rim of hole



consider atoms at rim of hole

you won't forget this





Join now!

PeerInstruction.net



1 lecture

2 PI

3 PI 2.0



1991

1 lecture

2 PI

3 PI 2.0





1 lecture

2 PI

3 PI 2.0

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



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optics i

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1

2

3

4

5

6

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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

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optics i

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6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

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

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](#)[feedback & support](#)**1** lecture**3** PI 2.0

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optics i

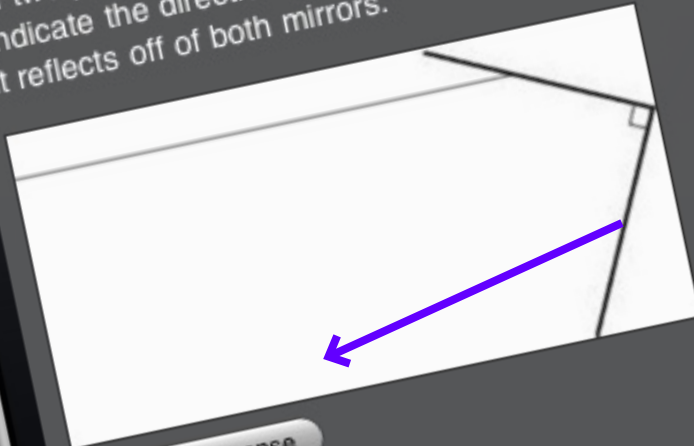
current session: **766079** | 69 students[Map](#) [Show floating session ID](#) [Edit](#) [Delete](#)

6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

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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

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feedback & support

1 lecture

3 PI 2.0

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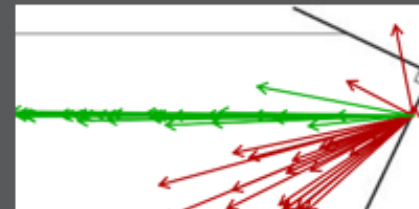
6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

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Round 1

57 responses, 58% correct

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1 lecture

3 PI 2.0

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optics i

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.

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Round 1

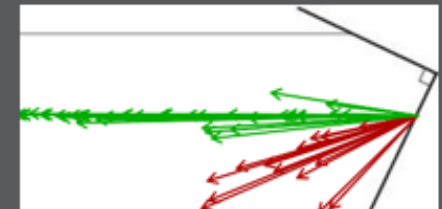
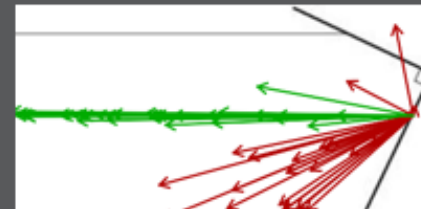


57 responses, 58% correct

Round 2



51 responses, 73% correct



✓ 8 get it now

✗ 0 still don't get it



feedback & support

1 lecture

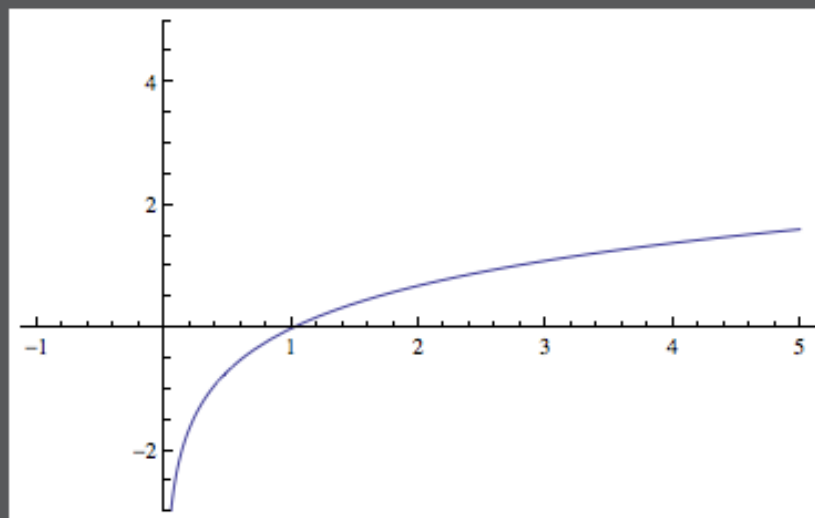
3 PI 2.0

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

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

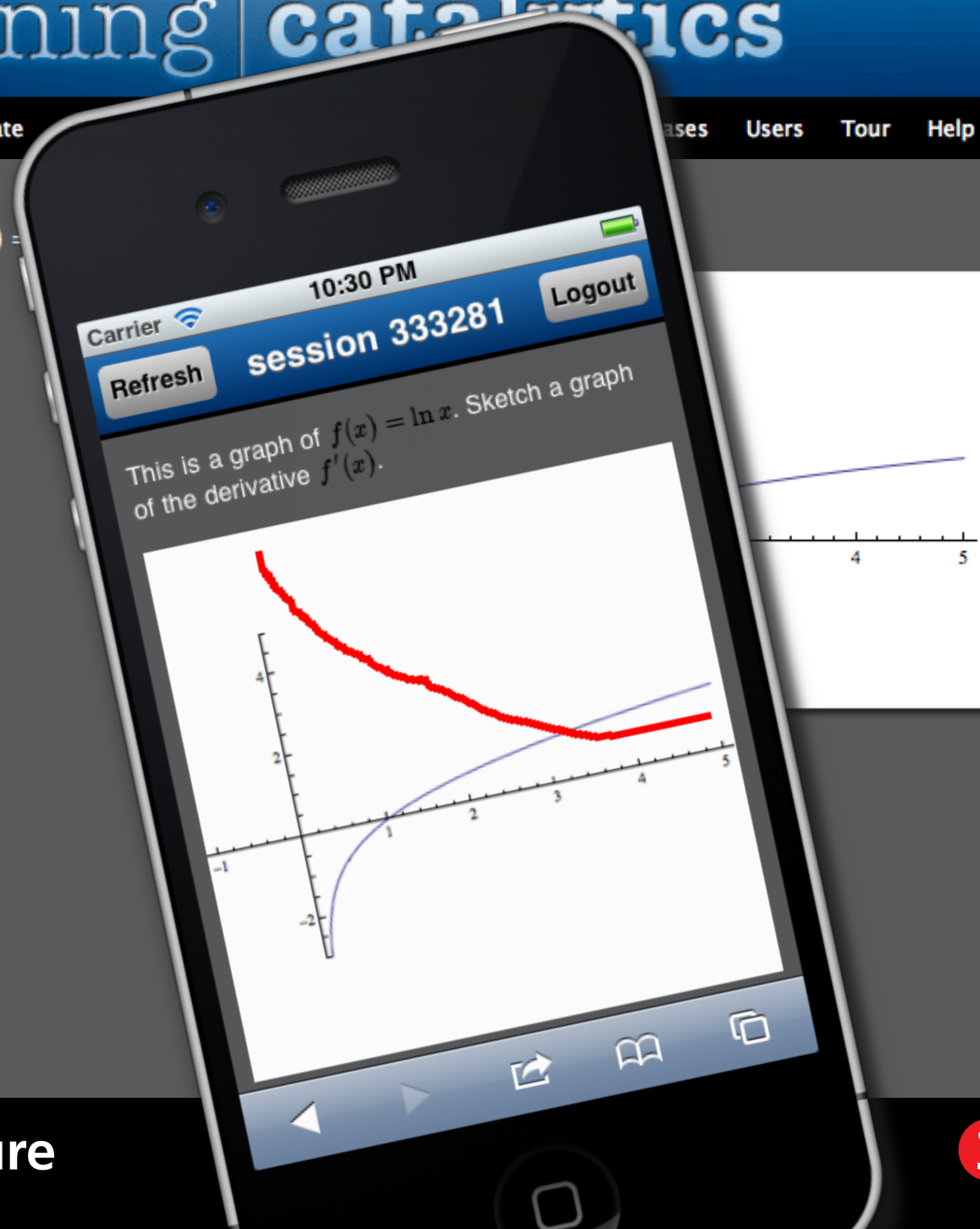


1 lecture

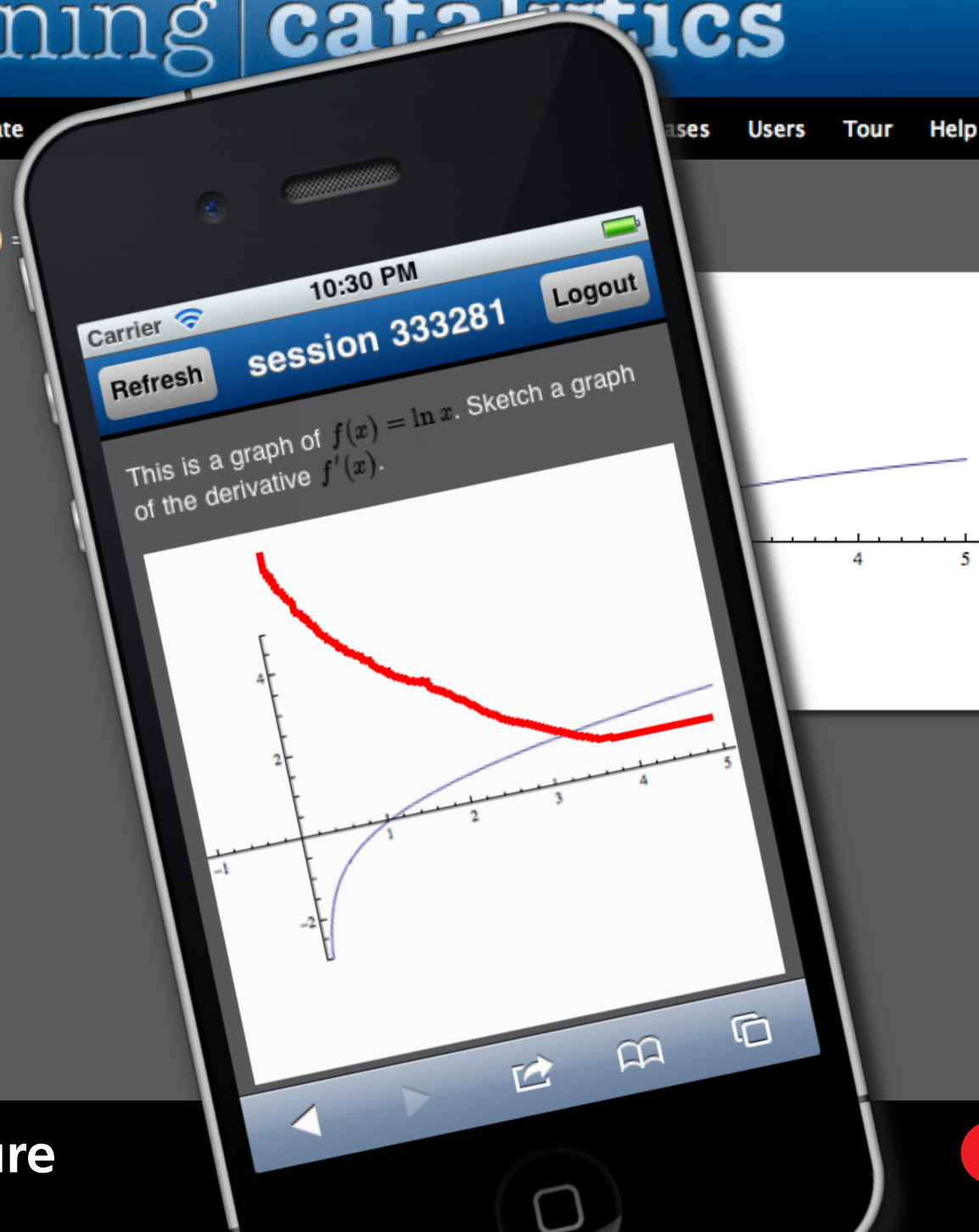
2 PI

3 PI 2.0

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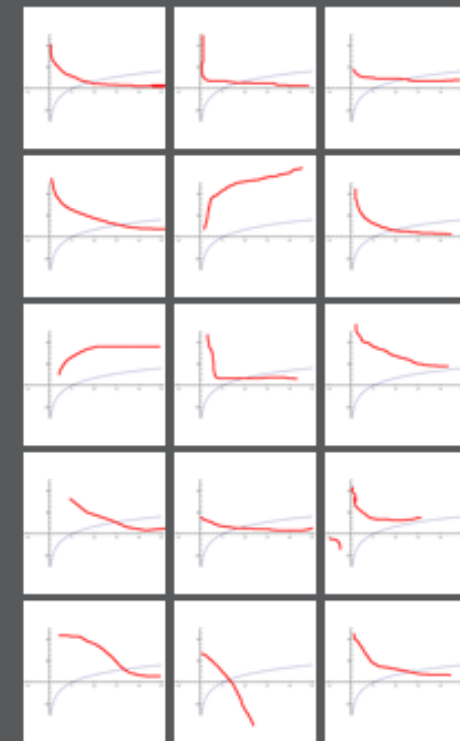
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Round 1

15 responses



✓ 6 get it now
✗ 0 still don't get it

1 lecture

3 PI 2.0

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transformations of parabolas

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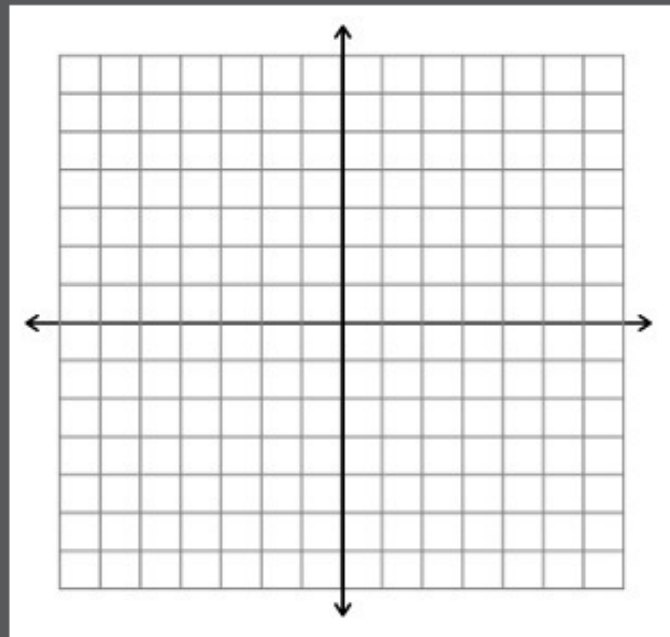
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1

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** lecture**2** PI**3** PI 2.0

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transformations of parabolas

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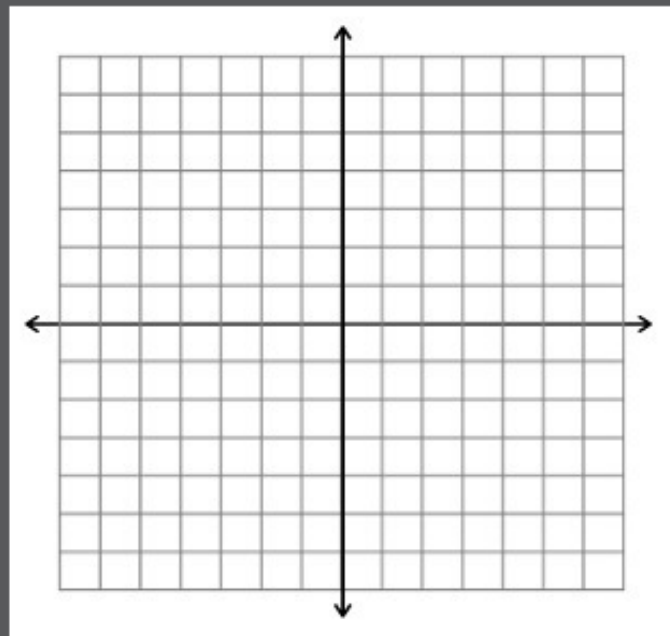
Jump to ▾

1

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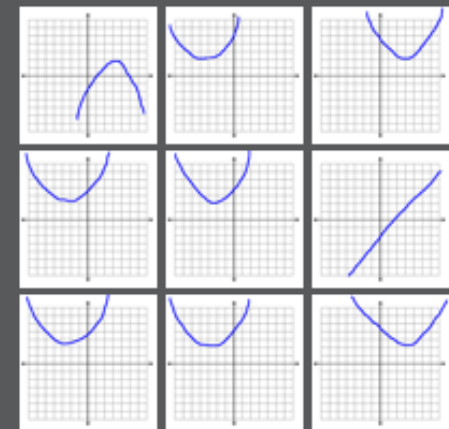
3

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** lecture**2** PI**3** PI 2.0



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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 lecture

2 PI

3 PI 2.0

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1. highlighting
sonnet?

this Shakespeare

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[Deliver again](#)

[Assign groups](#)

[Show all results](#)

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

Carrier 10:32 PM session 333281 Logout
Refresh

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;
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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

1 lecture

3 PI 2.0

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1. highlighting
sonnet?

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Which to rep
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Shall hate be
Be, as thy pres
Or to thyself a
Make thee ano
That beauty stil

this 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
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But that thou none lovest is most
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That 'gainst thyself thou stick'st
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**Seeking that beauteous roof to
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Which to repair should be thy
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O, change thy thought, that I may
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Shall hate be fairer lodged than
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Be, as thy presence is, gracious
and kind,

What do you see as the most important part
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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 lecture

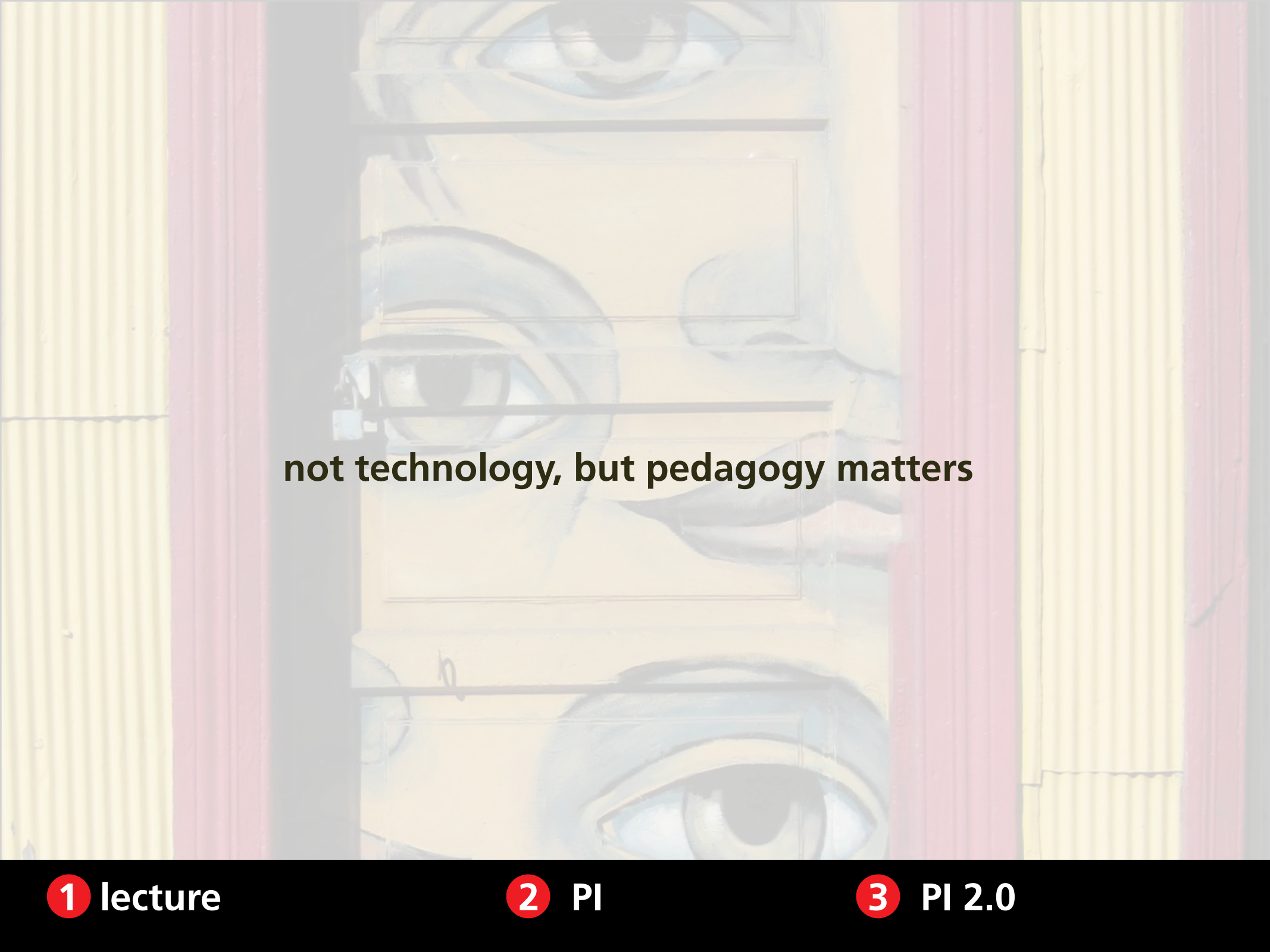
3 PI 2.0



1 lecture

2 PI

3 PI 2.0



not technology, but pedagogy matters



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*



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