

# Confessions of a converted lecturer



Brandeis University  
Waltham, MA, 9 March 2015





# Confessions of a converted lecturer



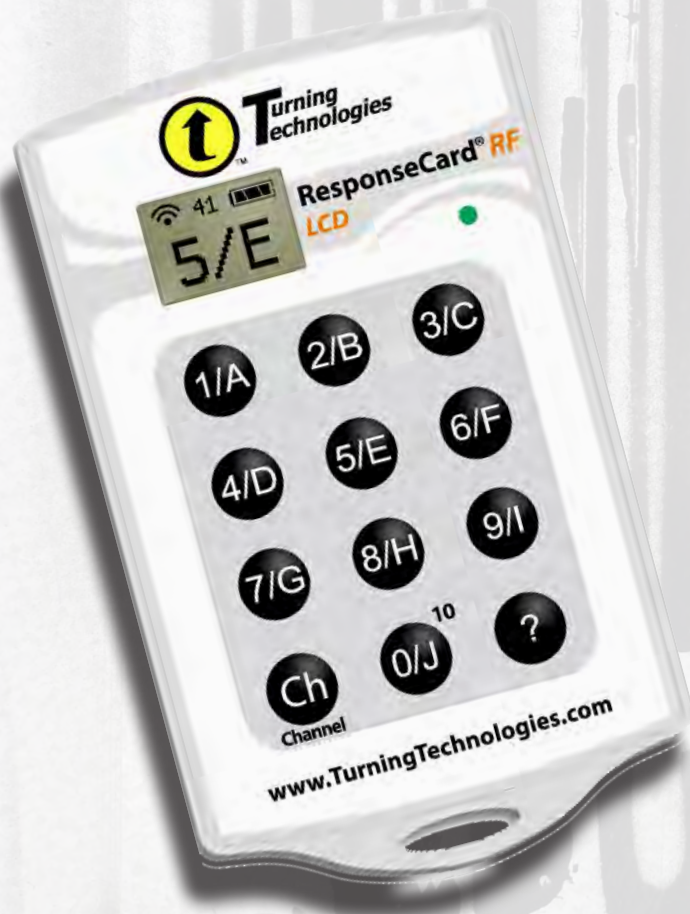
@eric\_mazur

EDUCATION

Brandeis University  
Waltham, MA, 9 March 2015







- no ON/OFF button
- only last "click" counts
- display shows recorded answer





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unique ID on back of clicker



**Think of something you are good at**

**EDUCACION**



**Think of something you are good at**

***How did you become good at this?***

**EDUCACION**



**Became good at it by:**

- 1. trial and error**
- 2. lectures**
- 3. practicing**
- 4. apprenticeship**
- 5. other**







Why did the lecture...  
Personal...  
The...  
The...  
The...  
The...  
The...

...  
...  
...  
...  
...  
...









1 education

2 PI





1 education

2 PI

3 test





**better pay  
attention!**

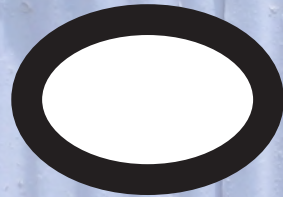
**1** education

**2** PI

**3** test



**What happens  
in a lecture?**





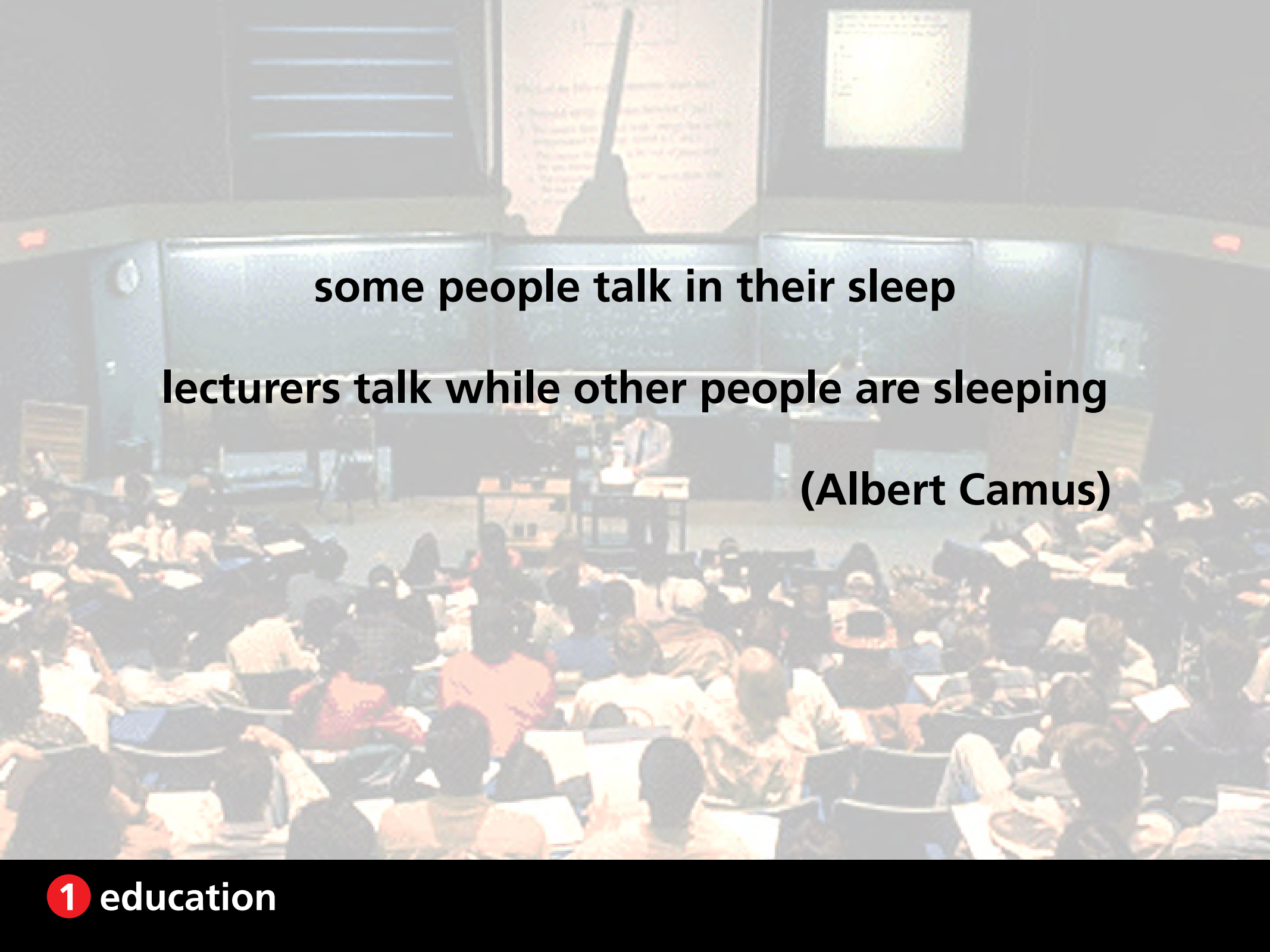




A large lecture hall with a professor at a podium and students in the audience. The room is filled with people, and there are large screens and a chalkboard in the background.

**some people talk in their sleep**

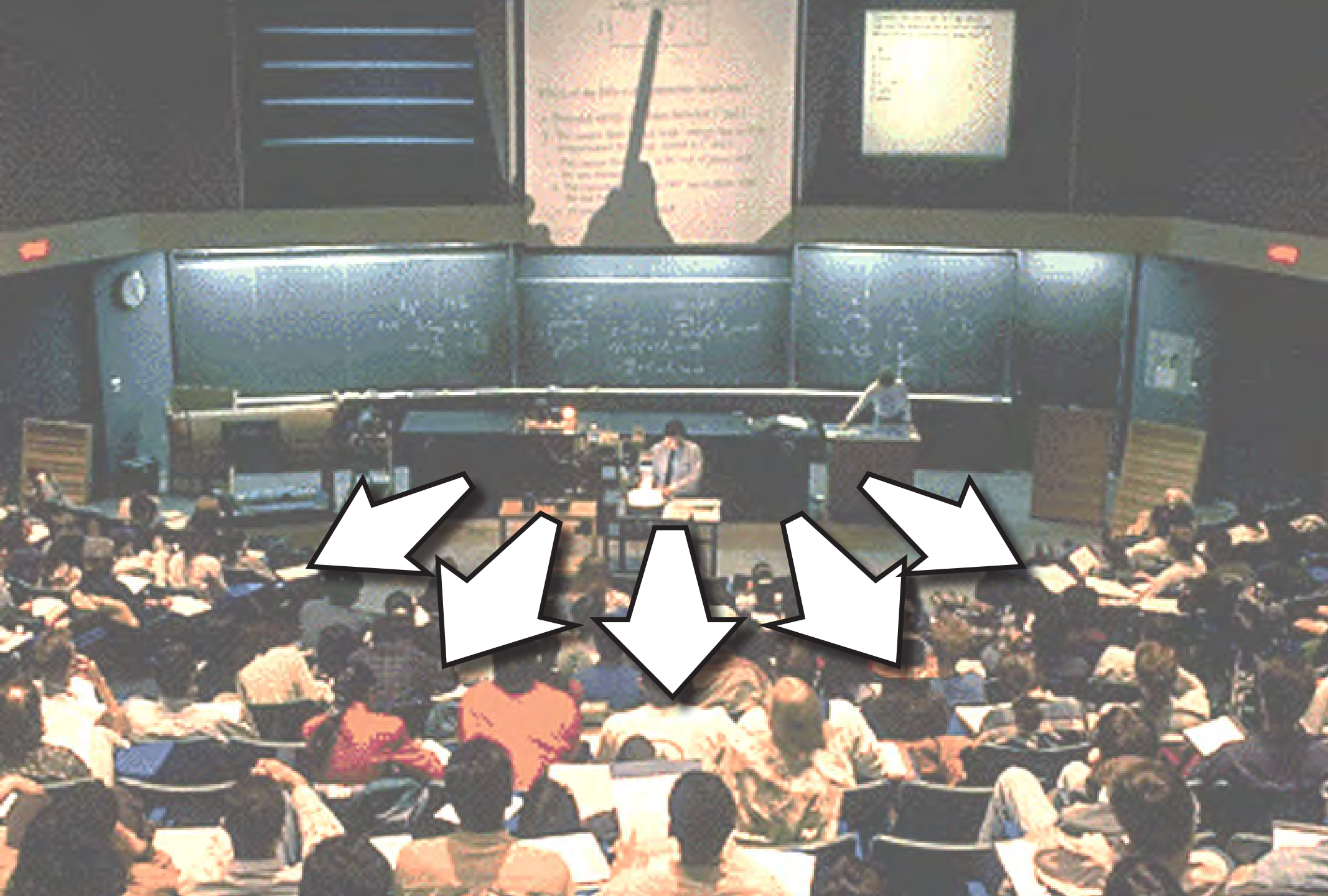


A large lecture hall with a lecturer at a podium and an audience of students. The room is filled with people, many of whom appear to be sleeping or resting. The lecturer is standing at a podium in the center, facing the audience. The audience is seated in rows of chairs, and many students have their heads down or are looking away. The room has a high ceiling and large windows. The text is overlaid on the image.

**some people talk in their sleep**  
**lecturers talk while other people are sleeping**  
**(Albert Camus)**









The result?

EDUCACION



**Lack of learning**

EDUCACION



**Lack of learning**

**Lack of retention**



**not transfer but assimilation of information is key**

**EDUCACION**





1 education

2 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)

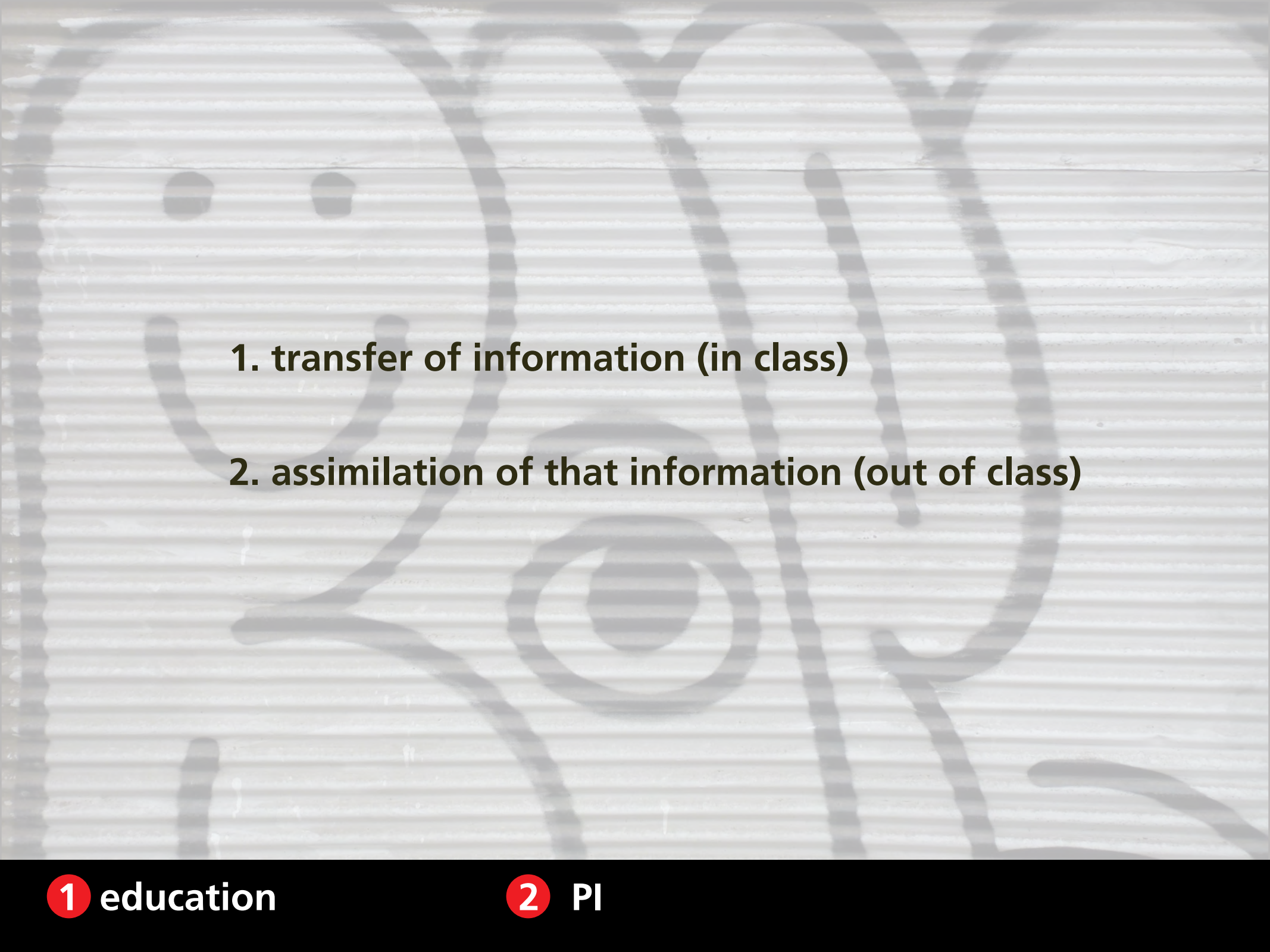


**Should focus  
on THIS!**

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)**



# Peer



1. transfer of information (out of class)

2. assimilation of that information (in class)

INSTRUCTION

question

1 education

2 PI



question



think

question



think



poll



**question**



**think**



**poll**



**discuss**

**question**



**think**



**poll**



**discuss**



**repoll**



**question**



**think**



**poll**



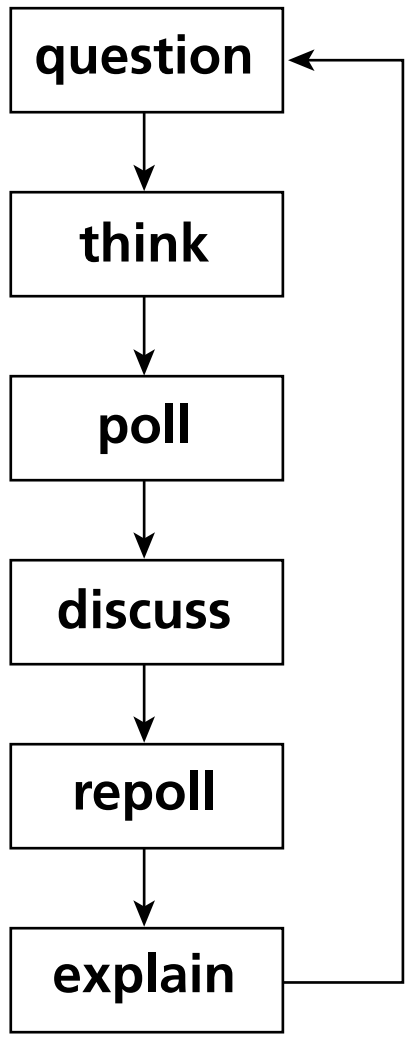
**discuss**



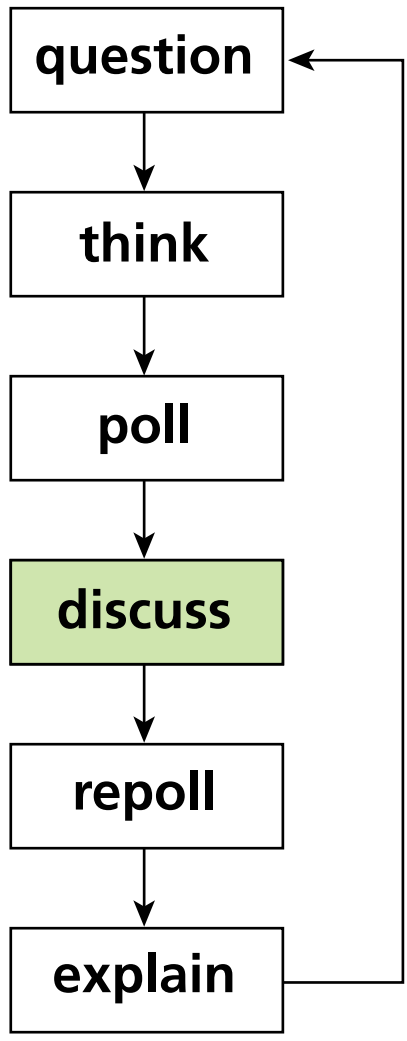
**repoll**



**explain**







**1** education

**2** PI



Let's try it!

QUESTION

think

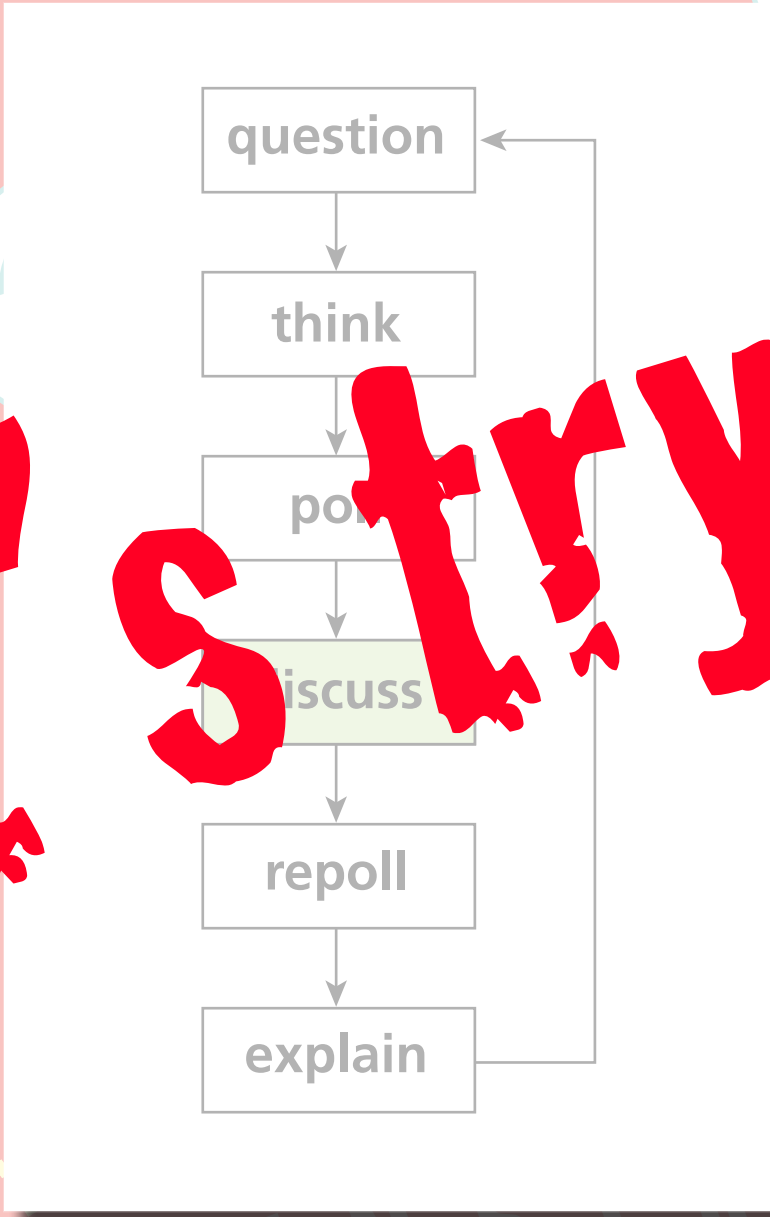
poll

discuss

repoll

explain

ACTION



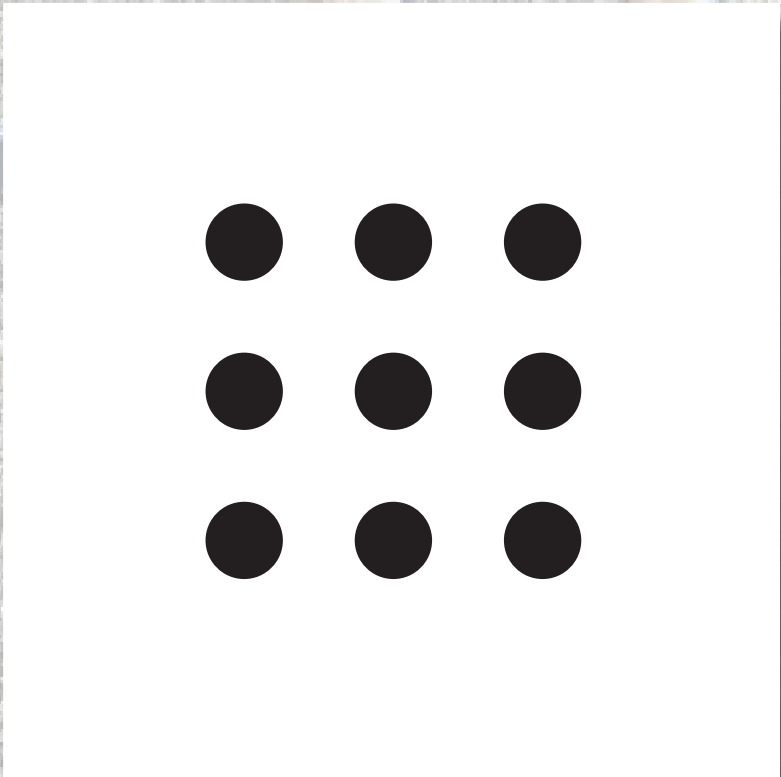
1 education

2 PI



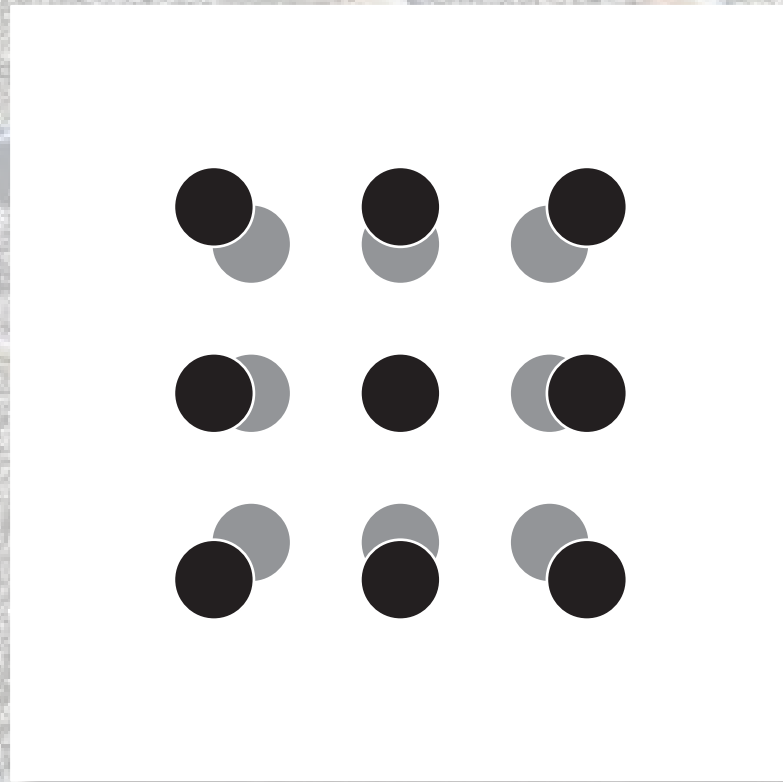
**thermal expansion**





**1** education

**2** PI





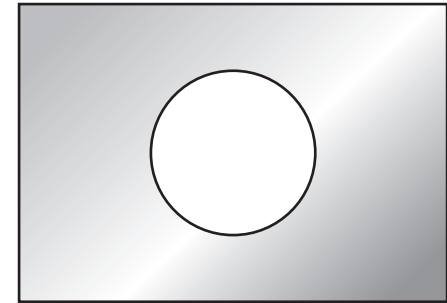
**all of them**



**1 education**

**2 PI**

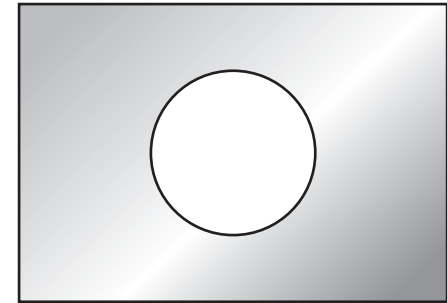
**Consider a rectangular metal plate  
with a circular hole in it.**





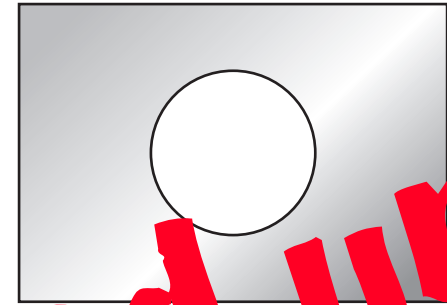
**Consider a rectangular metal plate with a circular hole in it.**

**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.



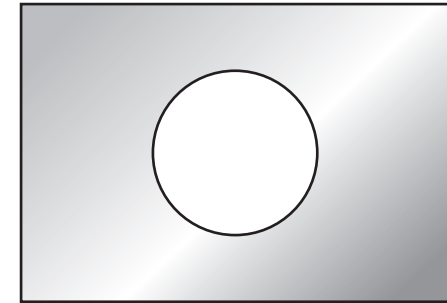
When the plate is uniformly heated, the diameter of the hole

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...**

**1** education

**2** PI

**3** test

**Before I tell you the answer, let's analyze what happened.**

**1** education

**2** PI

**3** test



**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**

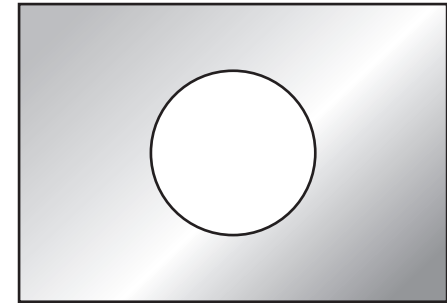
**Before I tell you the answer, let's analyze what happened.**

**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.**

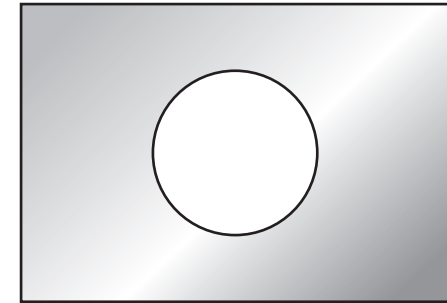
**When the plate is uniformly heated, the diameter of the hole**



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



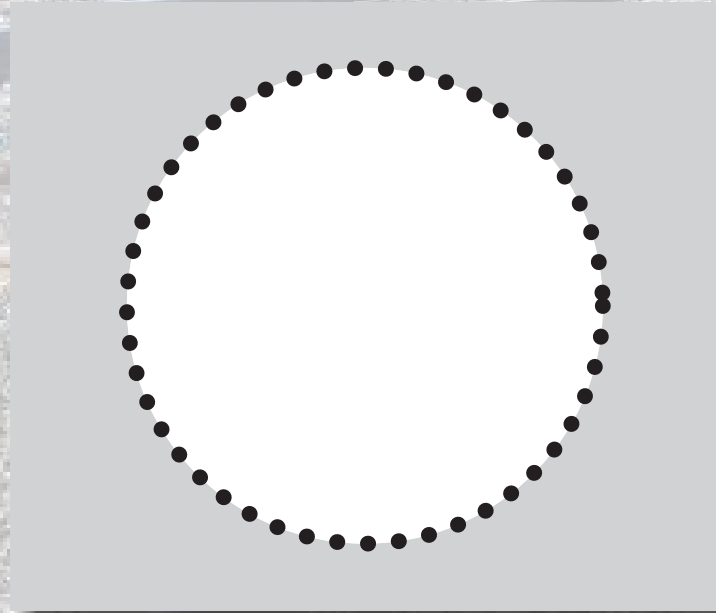
Consider a rectangular metal plate with a circular hole in it.



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

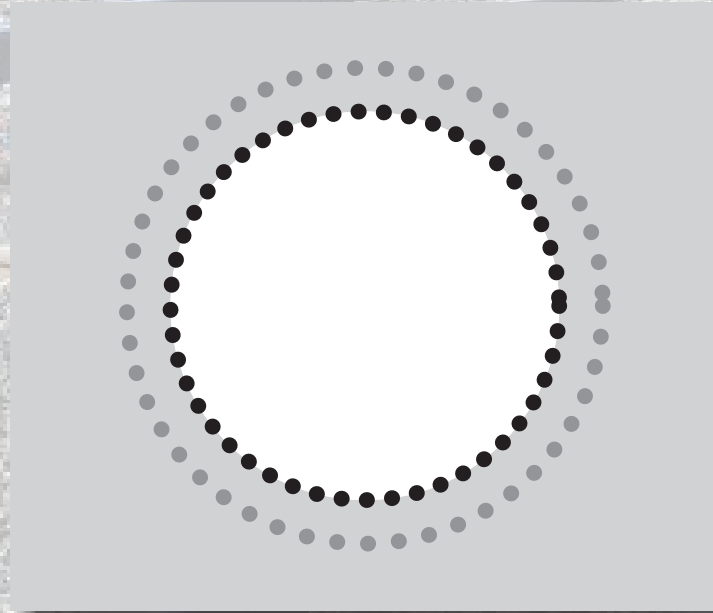


1 education

2 PI

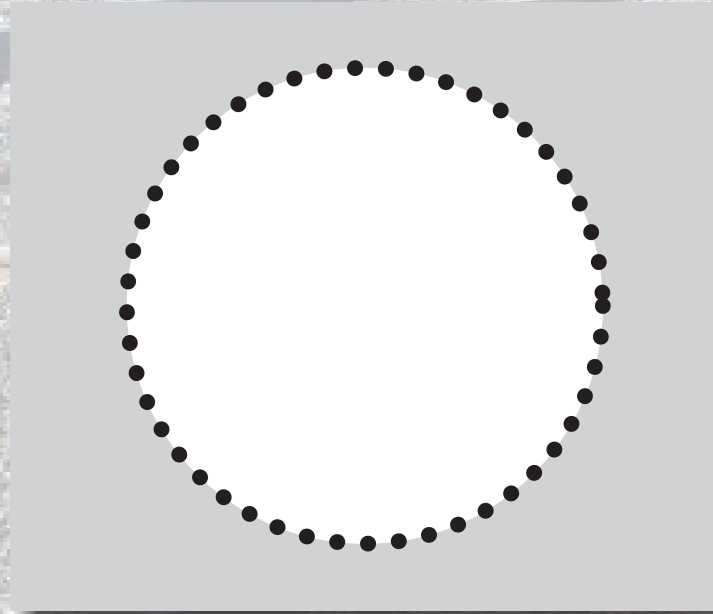
3 test

consider atoms at rim of hole





consider atoms at rim of hole

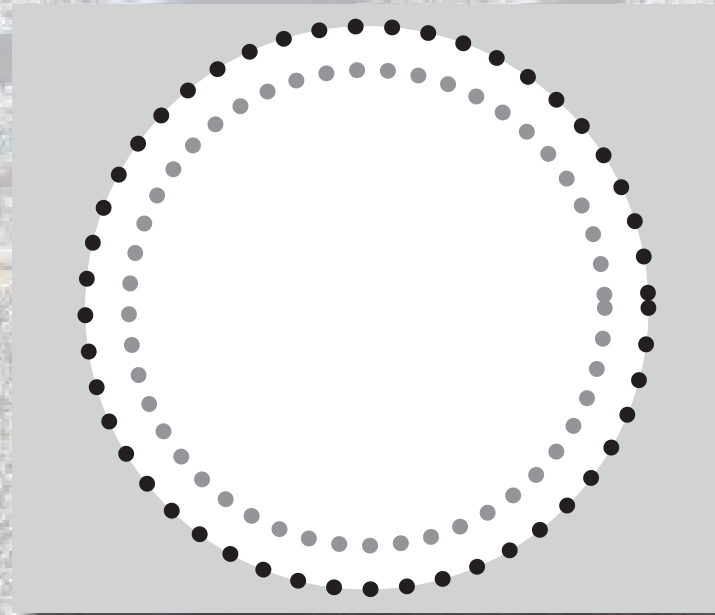


1 education

2 PI

3 test

consider atoms at rim of hole



1 education

2 PI

3 test

consider atoms at rim of hole

**you won't forget this**



**1** education

**2** PI

**3** test



Peer

back to pi

INSTRUCTION

1 education

2 PI

3 test

Peer  
Greater learning gains

INSTRUCTION

1 education

2 PI

3 test

**Peer**  
**Greater learning gains**

**Better retention**

**INSTRUCTION**

**1 education**

**2 PI**

**3 test**





**1** education

**2** PI

**3** test



in a lecture, students...

**1** education

**2** PI

**3** test

**in a lecture, students...**

**1. don't pay utmost attention**



**in a lecture, students...**

**1. don't pay utmost attention**

**2. think they know it**

**in a lecture, students...**

- 1. don't pay utmost attention**
- 2. think they know it**
- 3. are not confronted with misconceptions**



in a lecture, students...

1. don't pay utmost attention

2. think they know it

3. are not confronted with misconceptions

**false**  
**sense of security**





**1** education

**2** PI

**3** test



**an illusion. . .**

**1** education

**2** PI

**3** test





**Education is not just about:**

- **transferring information**
- **getting students to do what we do**

**1** education

**2** PI

**3** test



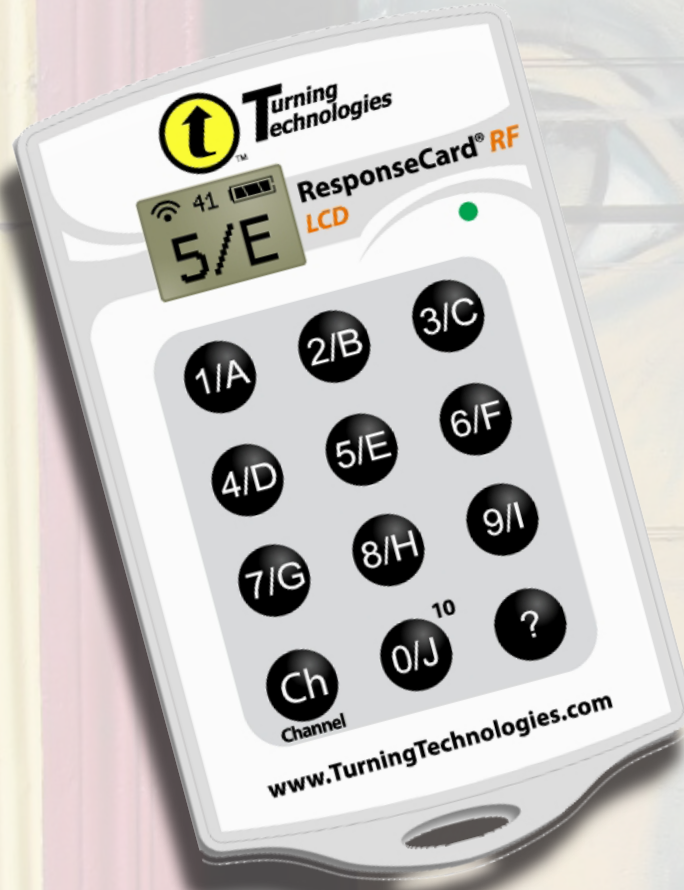


**Education is not just about:**

- **transferring information**
- **getting students to do what we do**

**active participation a must!**

# PLEASE RETURN CLICKER



1 education

2 PI

3 test



**Join now!**

**PeerInstruction.net**



**Funding:**

**National Science Foundation**

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