

Interactive Learning: Technology in the Classroom



Faculty Discussion on Pedagogy
Harvard Kennedy School
Cambridge, MA 8 November 2011



How do we learn?

Think of something you are good at — something that you know you do well.

How do we learn?

Think of something you are good at — something that you know you do well.

How did you become good at this?

How do we learn?

Became good at it by:

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

...and how do we teach?



Learning spaces



Learning spaces



Fought

Learning spaces



Education



Education

Some people talk in their sleep.

A large lecture hall with a professor at a podium and students in the audience. The room is filled with students sitting at desks, many of whom appear to be sleeping or resting. The professor is standing at a podium in the center of the stage, facing the audience. The room has a curved wall and a large screen at the front. The lighting is dim, and the overall atmosphere is one of a lecture in progress.

Education

A large lecture hall with a lecturer at the front and many students in the audience. The room is filled with people, and the lecturer is standing at a podium, addressing the class. The students are seated in rows, and many are looking towards the front. The room has a high ceiling and large windows.

Some people talk in their sleep.

Lecturers talk while other people are sleeping.

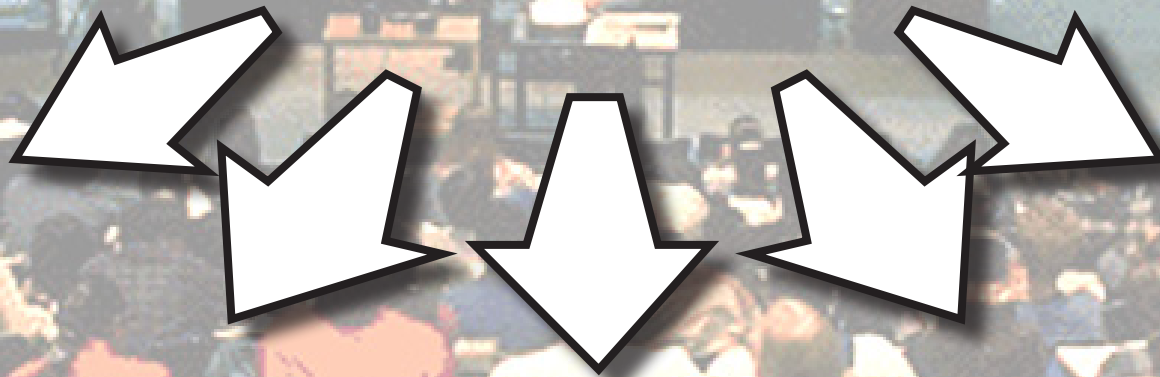
Albert Camus

Education



Education

lectures focus on information transfer...



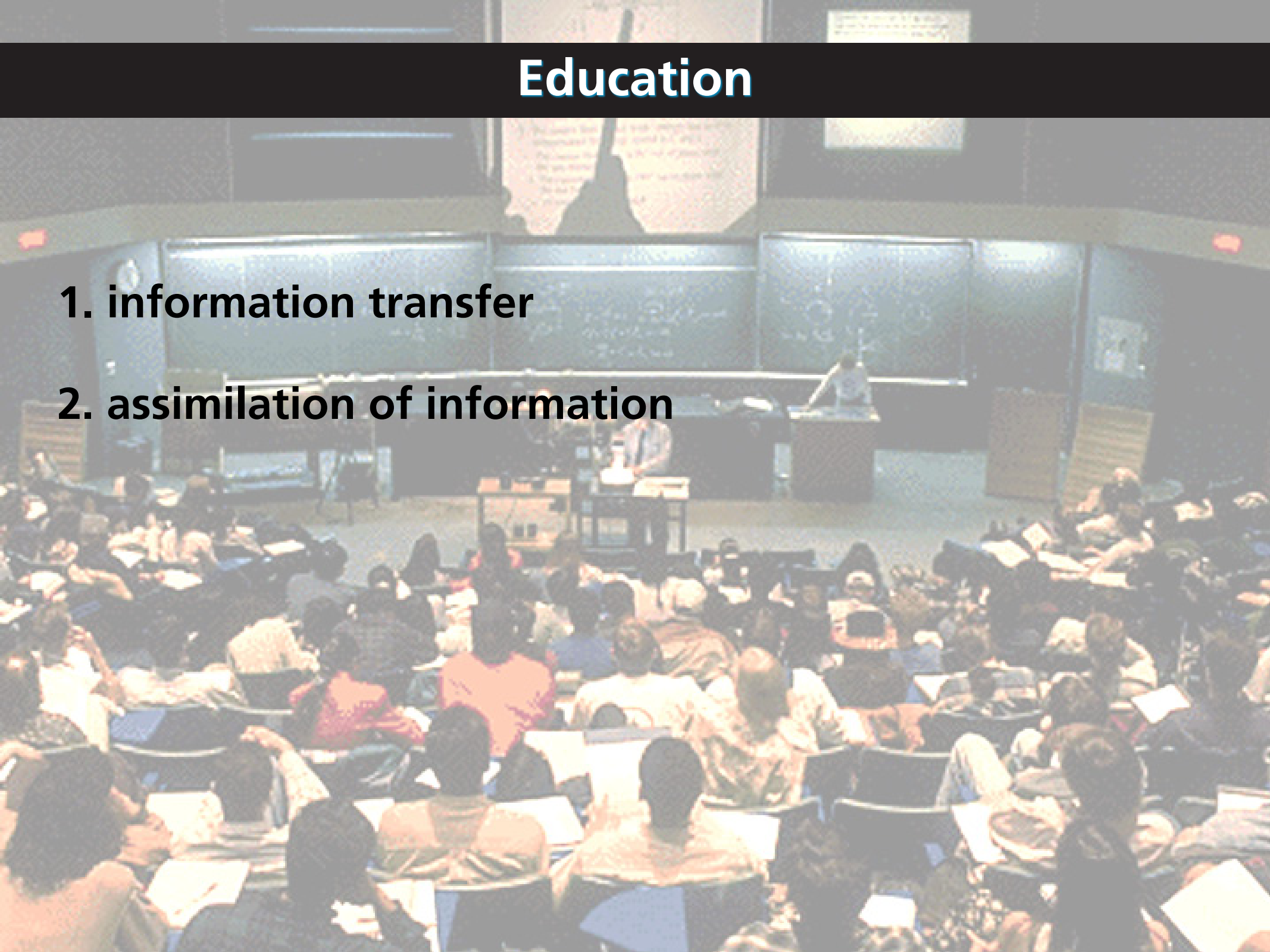
Education

1. information transfer

A wide-angle photograph of a large lecture hall. The room is filled with students seated at long desks, all facing towards the front. At the front of the room, a lecturer stands behind a podium, addressing the class. Behind the lecturer is a large, curved wall featuring a prominent chalkboard with some faint writing. Above the chalkboard, a large projection screen displays a slide with text and a diagram. The room is well-lit, and the atmosphere appears to be a formal academic setting.

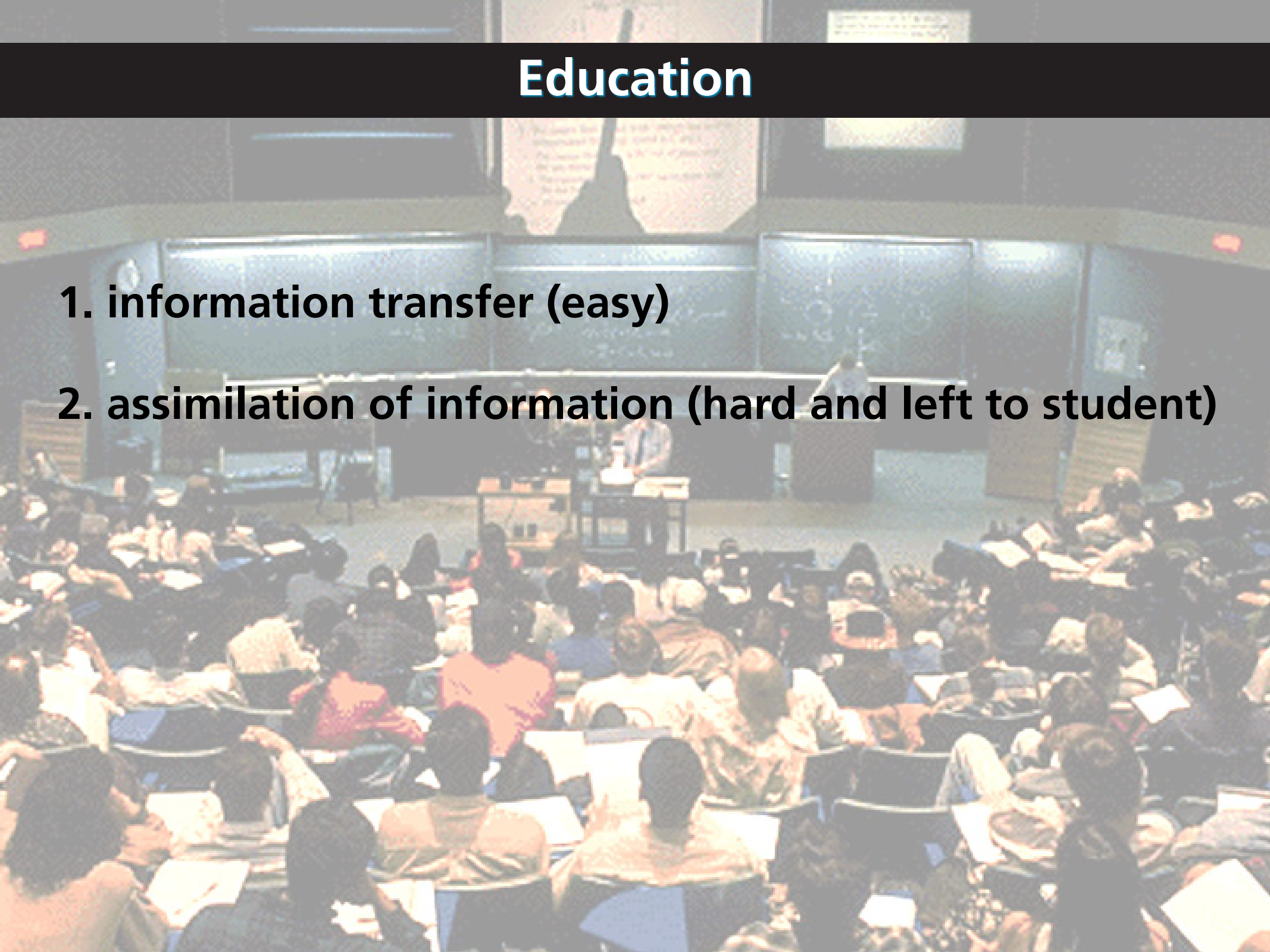
Education

1. information transfer
2. assimilation of information



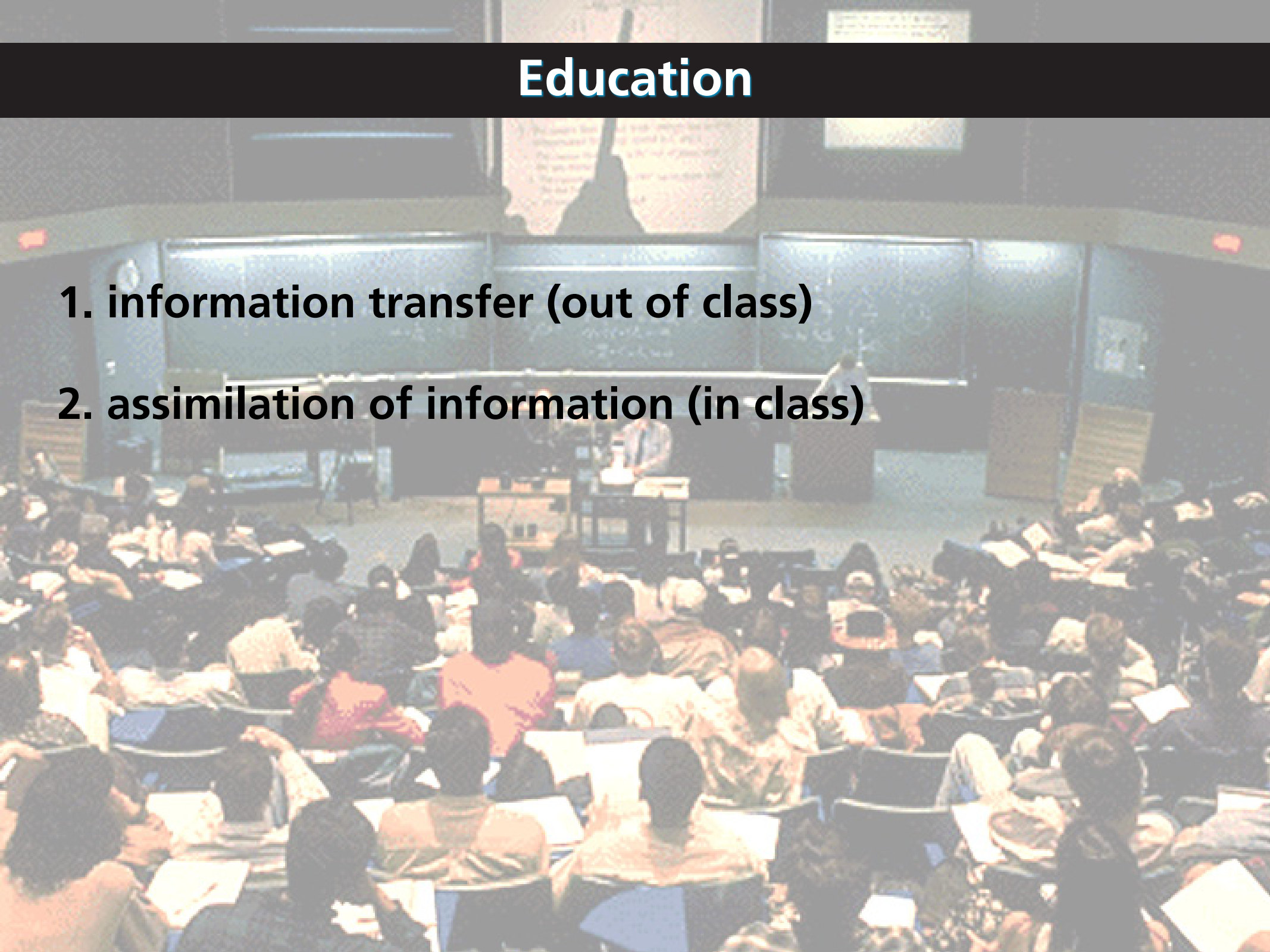
Education

1. information transfer (easy)
2. assimilation of information (hard and left to student)



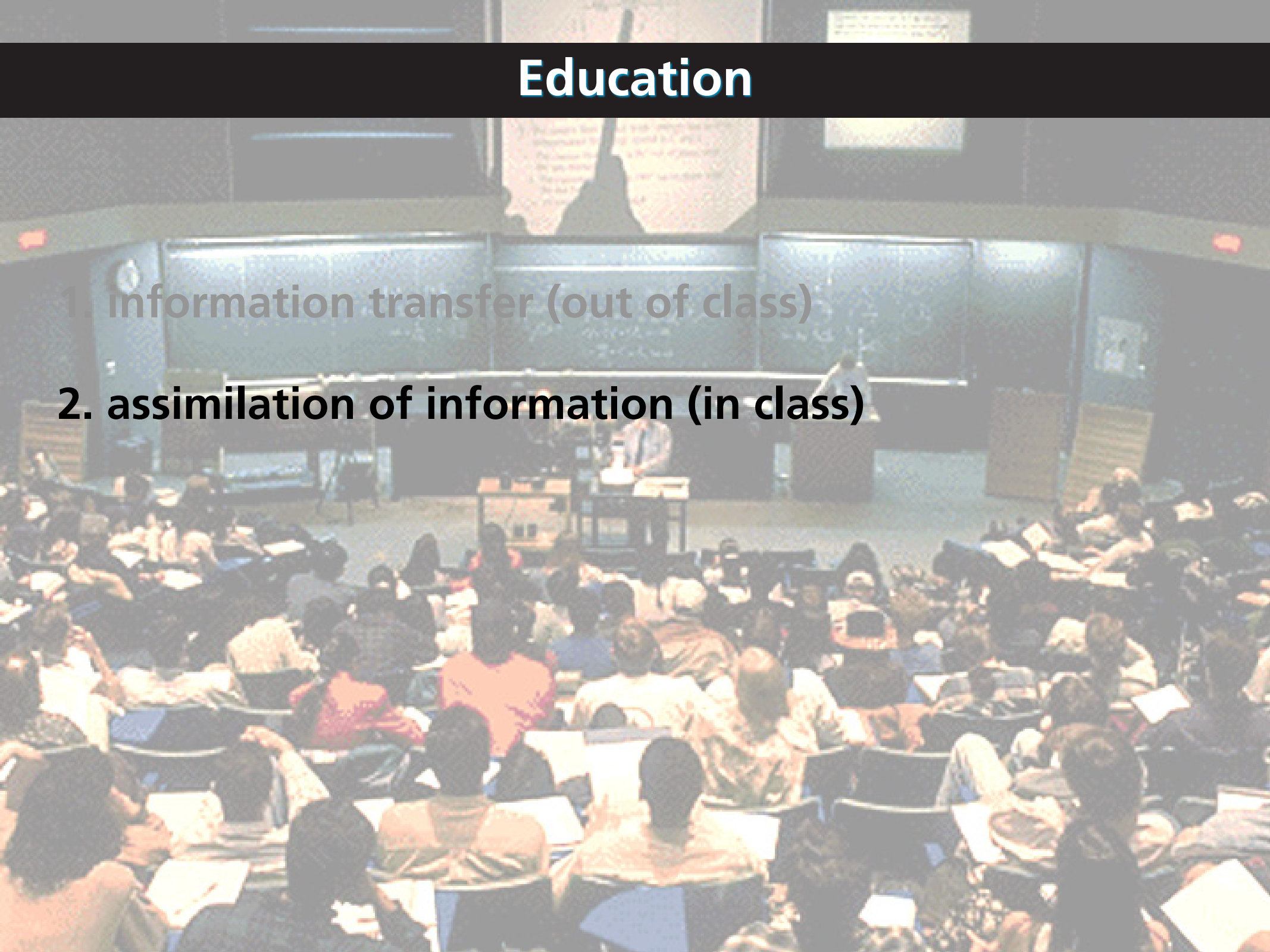
Education

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



Education

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



Peer Instruction

question



Peer Instruction



question



think

Peer Instruction



question



think



poll

Peer Instruction



question



think



poll



discuss

Peer Instruction



question



think



poll



discuss



repoll

Peer Instruction



question



think



poll



discuss

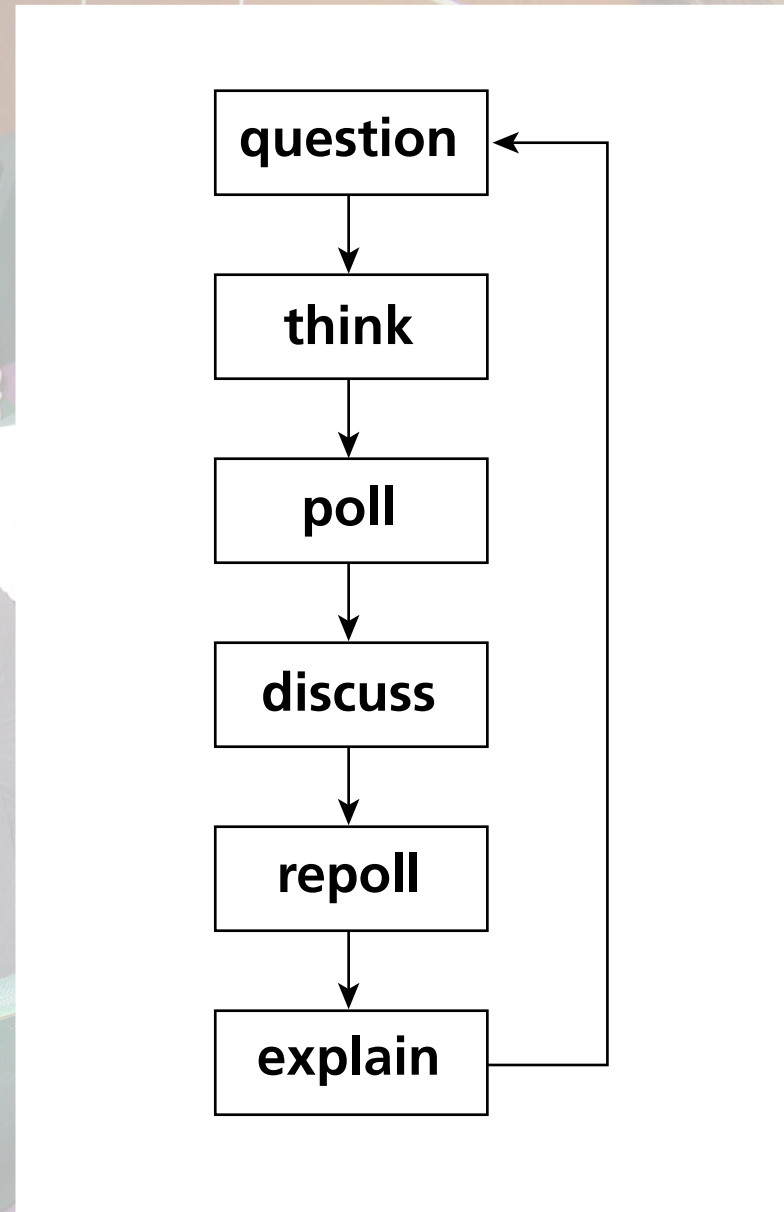


repoll

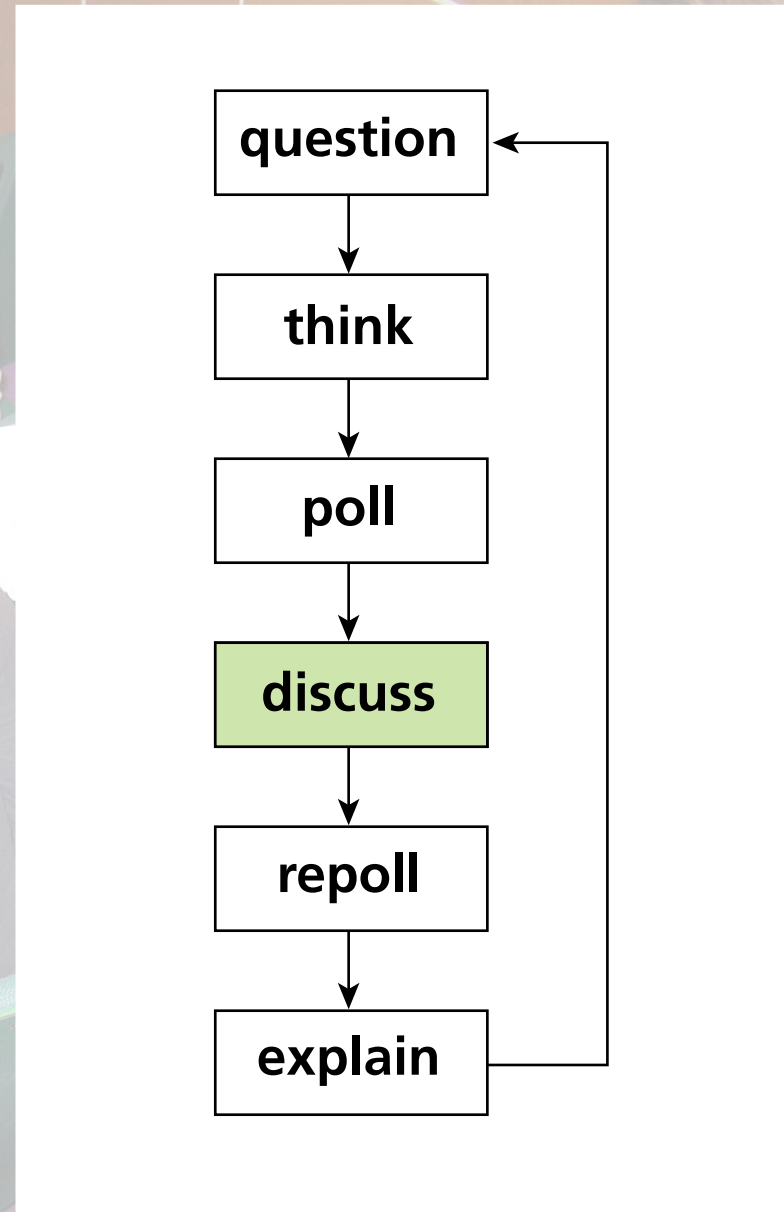


explain

Peer Instruction



Peer Instruction



Peer Instruction

Higher learning gains

INSTRUCTION

Peer Instruction

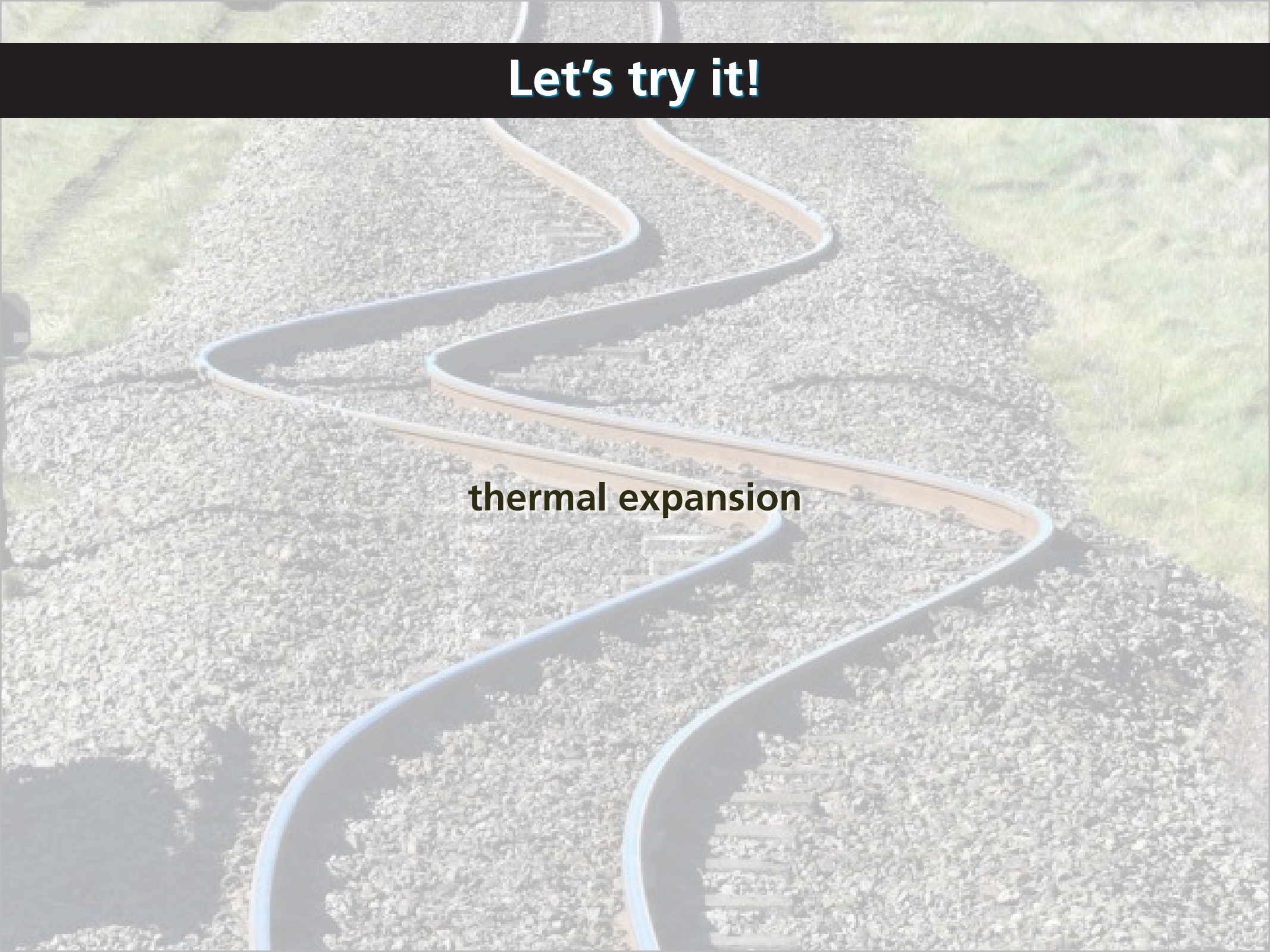
Higher learning gains

Better retention

PEER INSTRUCTION

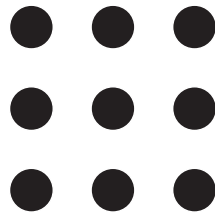
Let's try it!

thermal expansion



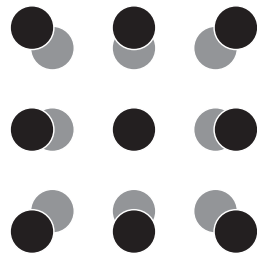
Let's try it!

When metals heat up, they expand because all atoms get farther away from each other.



Let's try it!


When metals heat up, they expand because all atoms get farther away from each other.



Let's try it!

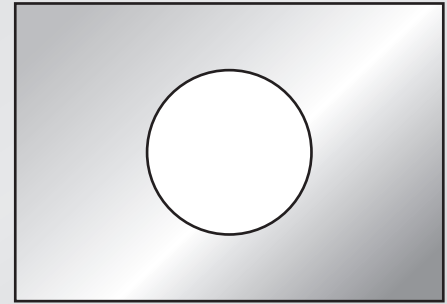
When metals heat up, they expand because all atoms get farther away from each other.

all of them



Let's try it!

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

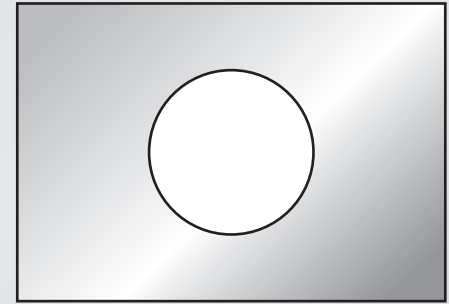


Let's try it!

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.



Let's try 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.



you got all fired up!

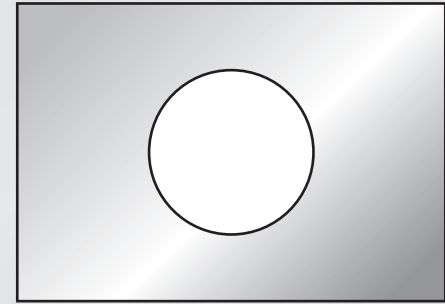


Let's try it!

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.

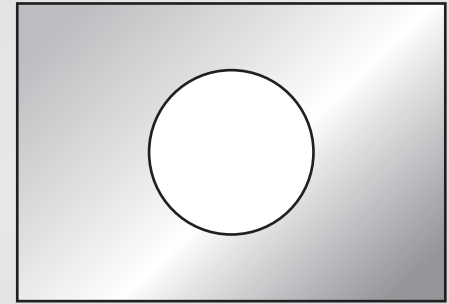


Let's try it!

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

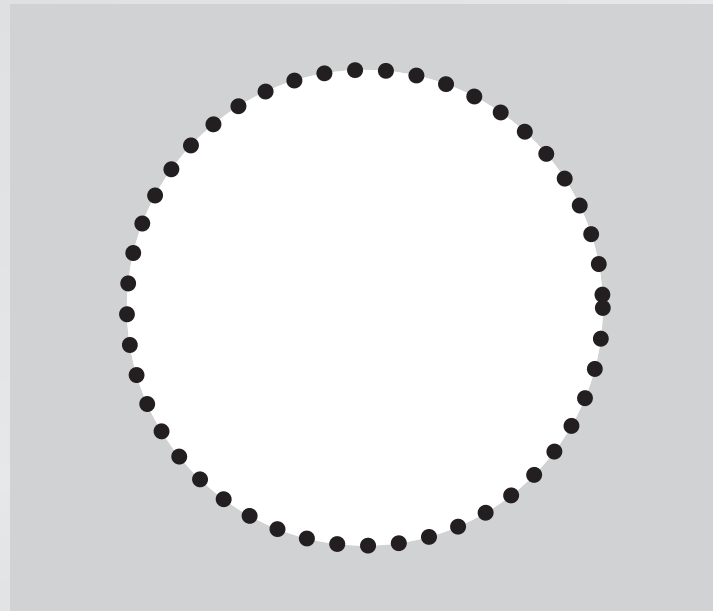
When the plate is uniformly heated, the diameter of the hole

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



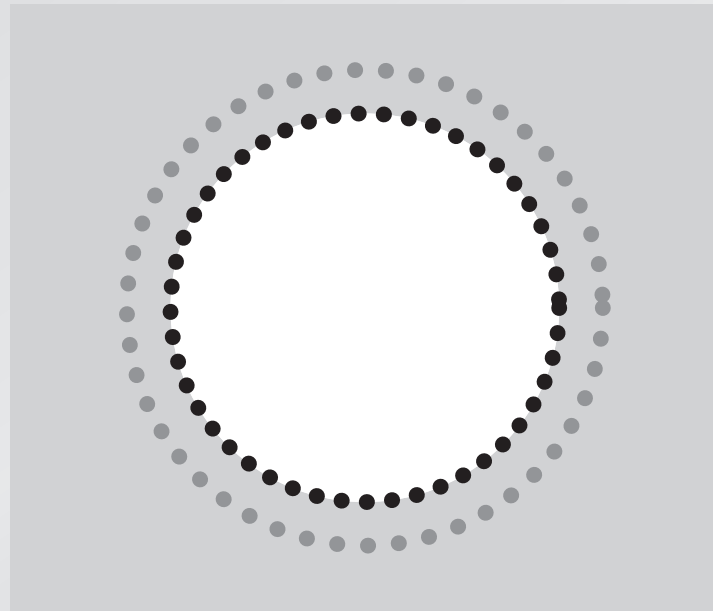
Let's try it!

consider the atoms at the rim of the hole



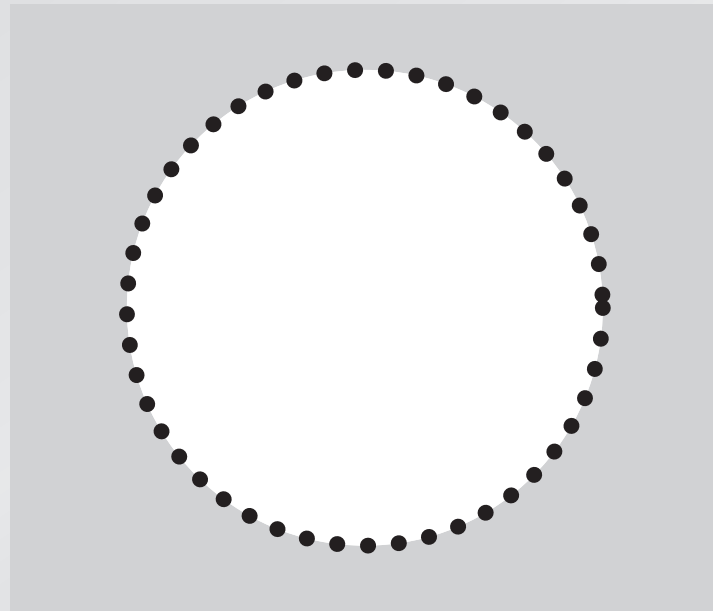
Let's try it!

consider the atoms at the rim of the hole



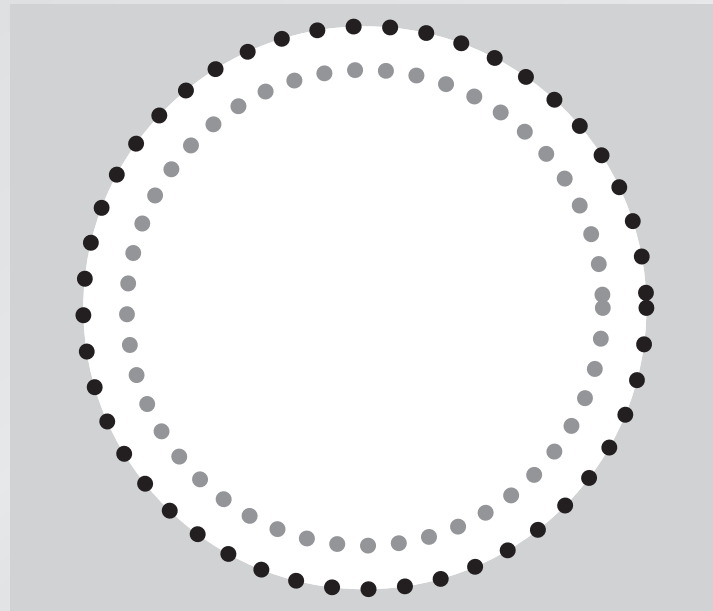
Let's try it!

consider the atoms at the rim of the hole



Let's try it!

consider the atoms at the rim of the hole



Let's try it!

consider the atoms at the rim of the hole

you won't forget this



Why does it work?

Students:

- promotes thinking
- helps uncover and address misunderstanding
- boosts confidence

Why does it work?

Students:

- promotes thinking
- helps uncover and address misunderstanding
- boosts confidence

Faculty:

- change of format, not content
- with existing questions, little effort
- adaptable

Conclusion

A little reorganization goes a long way!

Funding:

National Science Foundation

for a copy of this presentation:

<http://mazur.harvard.edu>

Follow me!



eric_mazur