

Confessions of a converted lecturer



9th Teikyo-HSPH Symposium
Harvard School of Public Health
Boston, MA, 4 September 2014



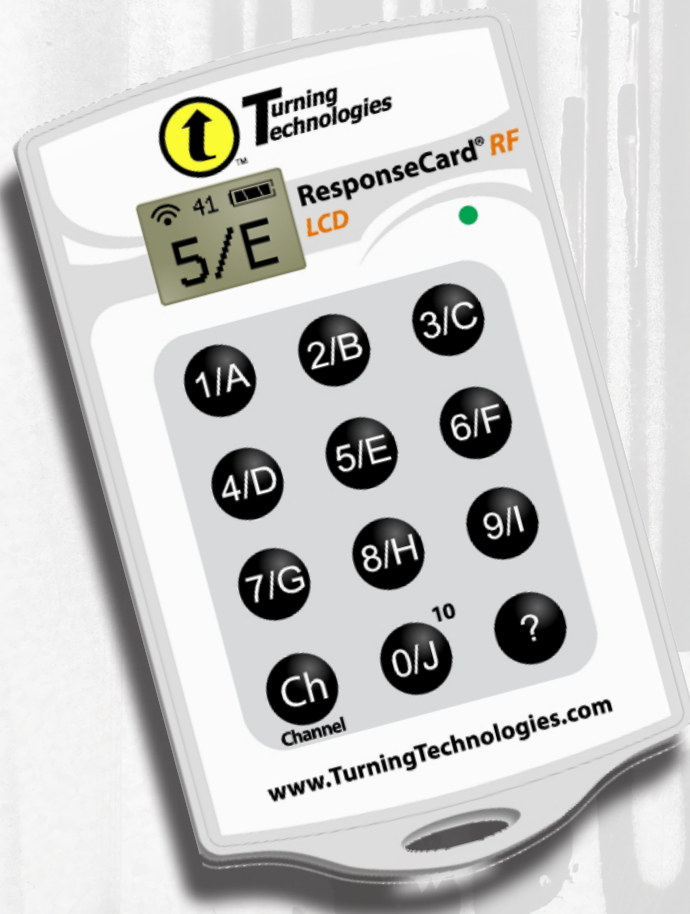
Confessions of a converted lecturer



@eric_mazur

9th Teikyo-HSPH Symposium
Harvard School of Public Health
Boston, MA, 4 September 2014





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



www.TurningTechnologies.com



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?**

Became good at it by:

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











1 education

2 PI


3 test



1 education

2 PI

3 test

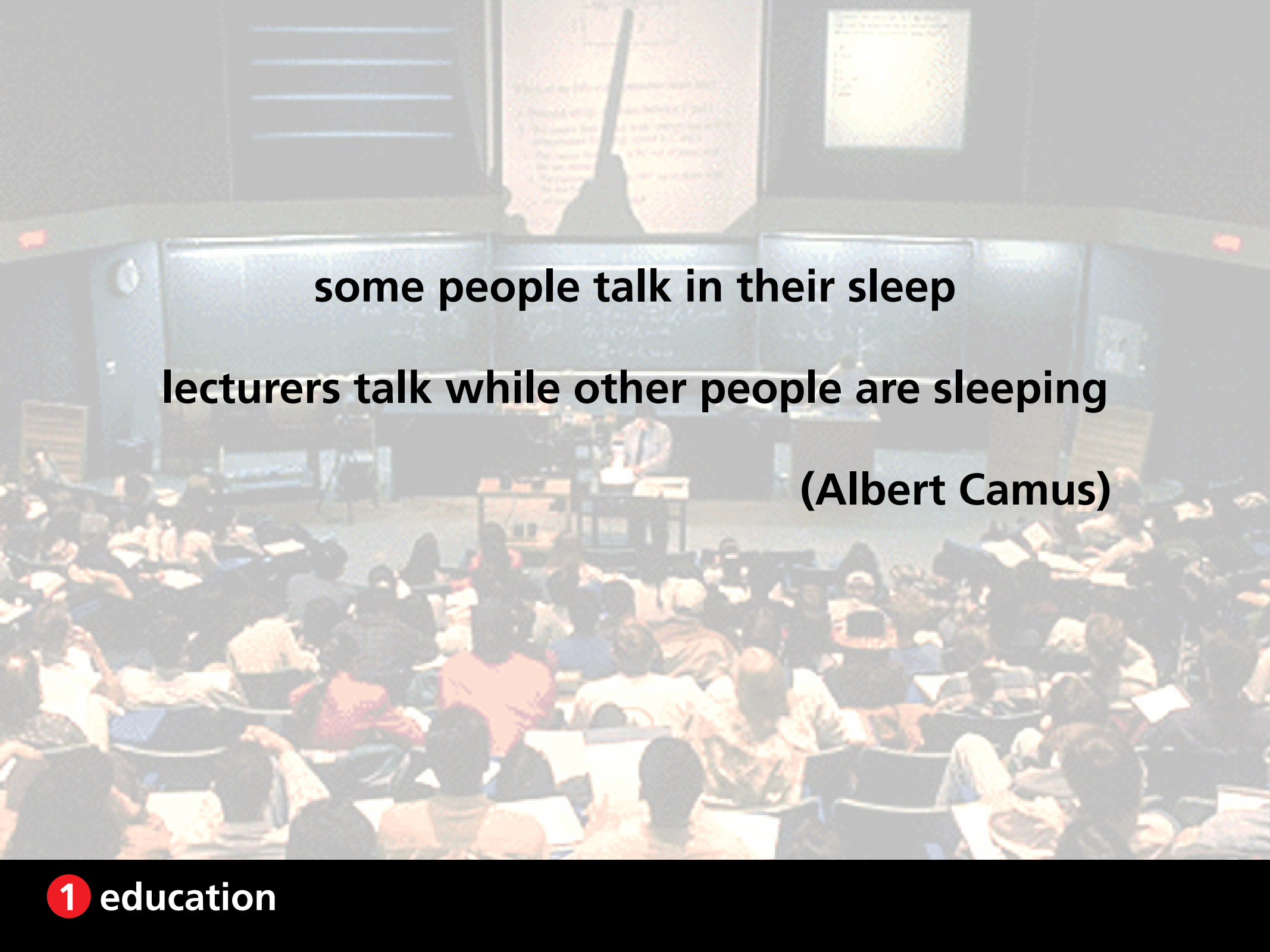


**What happens
in a lecture?**



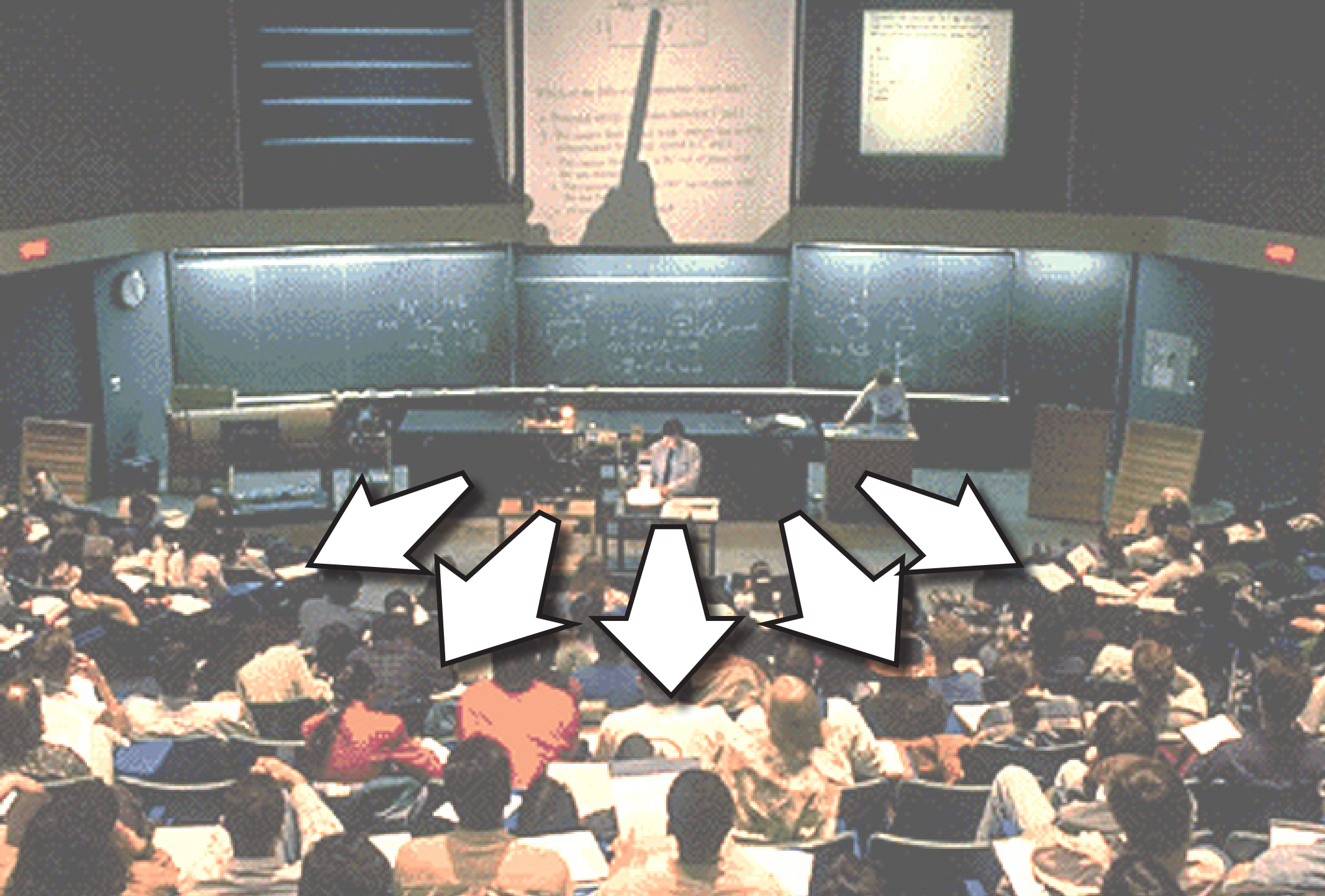
A wide-angle photograph of a large lecture hall. In the foreground, many students are seated at desks, many of whom appear to be sleeping or resting with their heads down. The room is filled with students, and the desks are arranged in rows. At the front of the hall, a lecturer is standing near a podium, addressing the class. Behind the lecturer are several large projection screens displaying text and diagrams. The room has a high ceiling and a curved front wall.

some people talk in their sleep

A large lecture hall filled with students. In the foreground, many students are sleeping with their heads down. In the background, a lecturer is standing at a podium, addressing the class. The room has large windows and a chalkboard.

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





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)

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





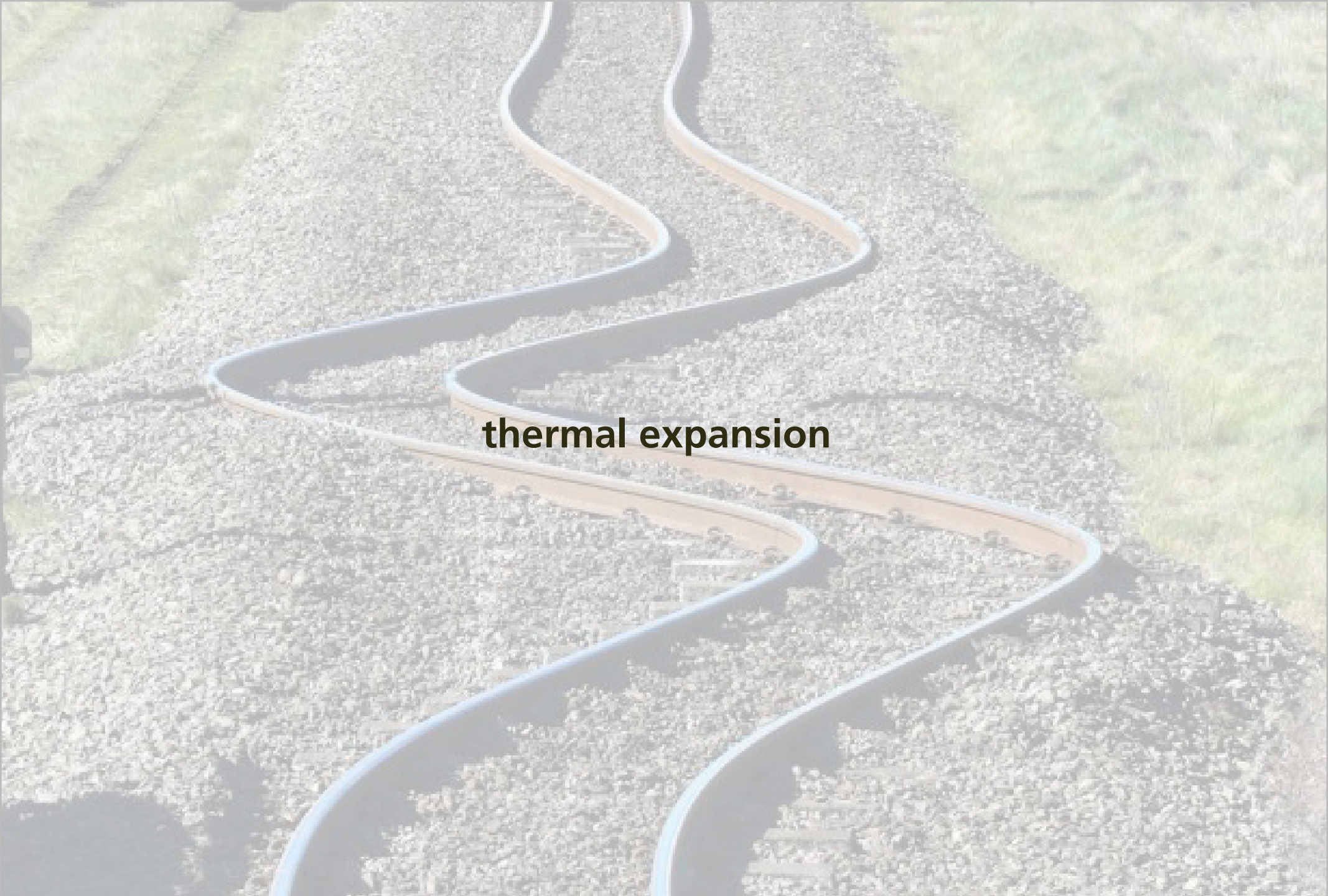
1 education

2 PI

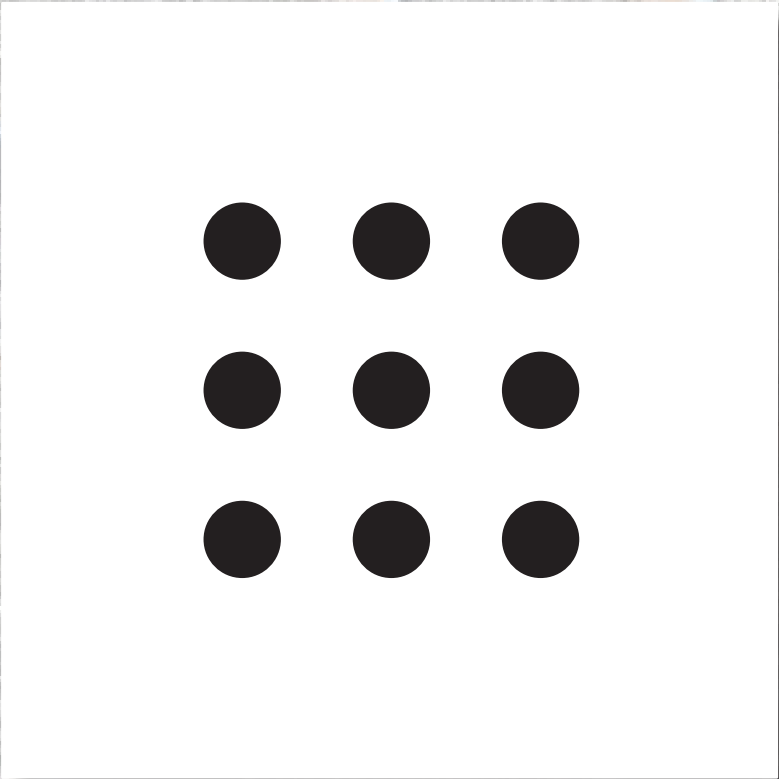
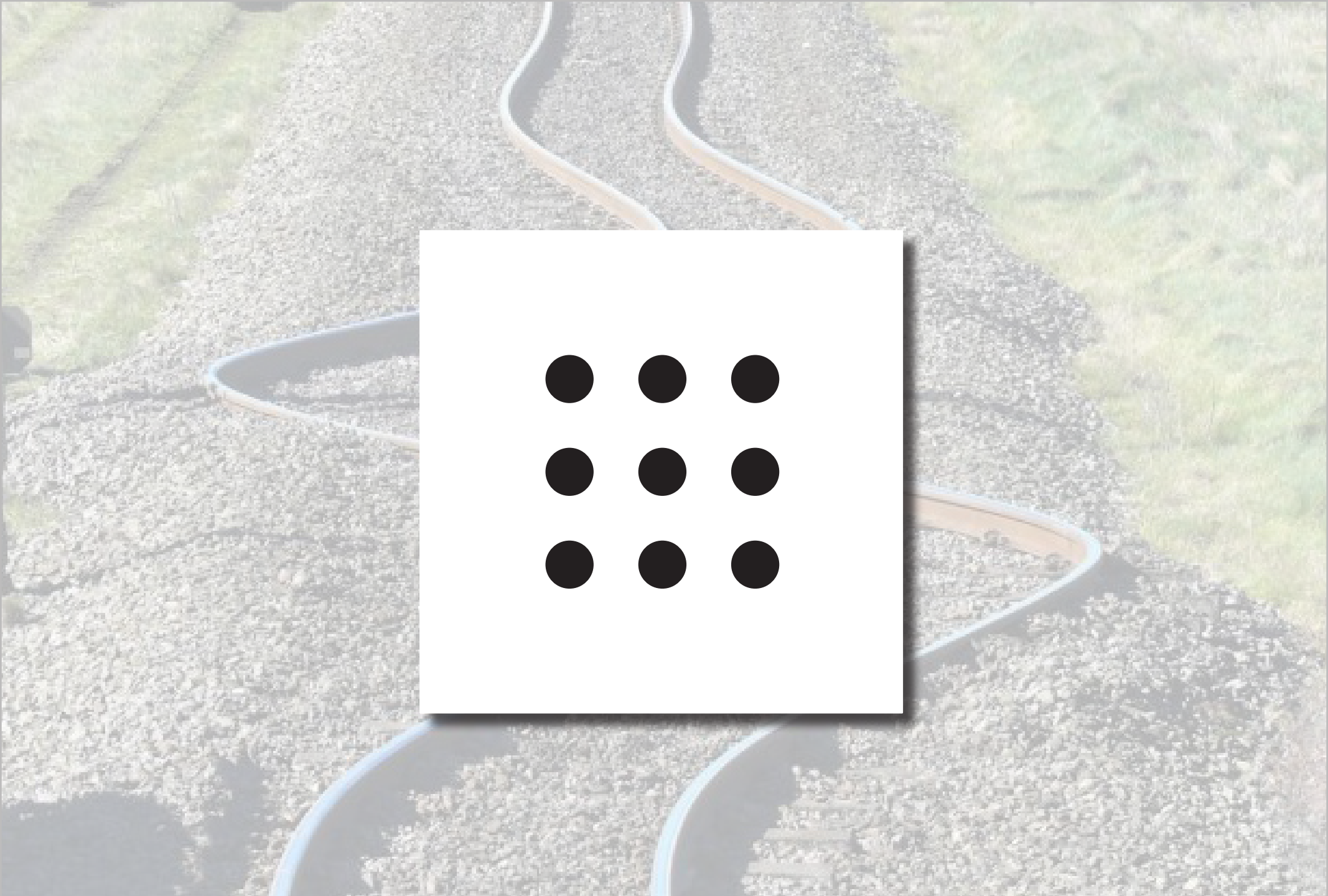


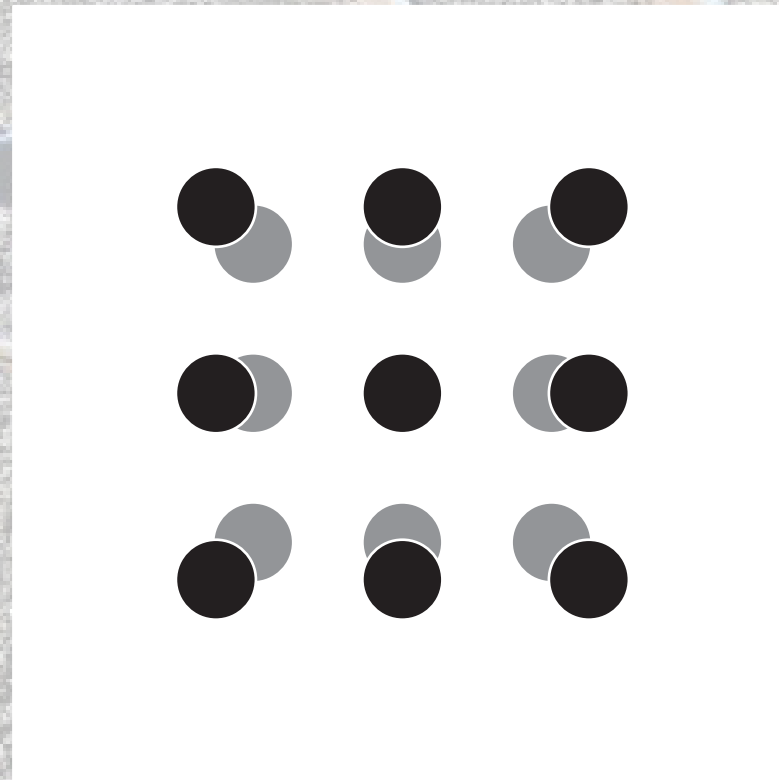
1 education

2 PI

An aerial photograph of a railway track. The track is composed of two parallel steel rails, which are highlighted with a blue-to-orange gradient. The rails are laid on a bed of dark grey gravel. The track is not straight but follows a wavy, S-shaped path across the landscape. The surrounding area is covered in green grass. The text "thermal expansion" is written in a bold, black, sans-serif font, centered over the middle of the track.

thermal expansion





all of them



1 education

2 PI

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



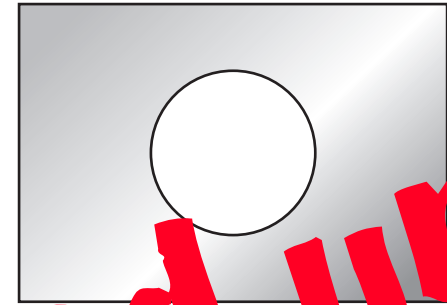
Consider a rectangular metal plate with a circular hole in it.



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.

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...

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.**

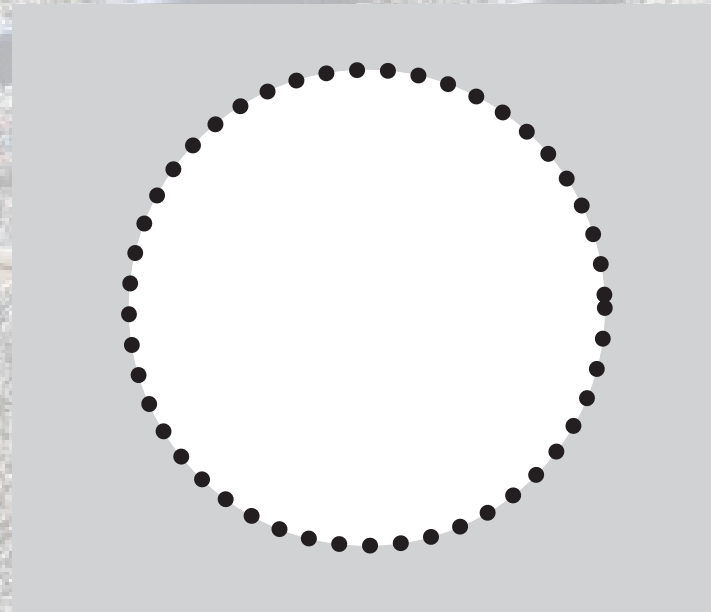
Consider a rectangular metal plate with a circular hole in it.



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

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

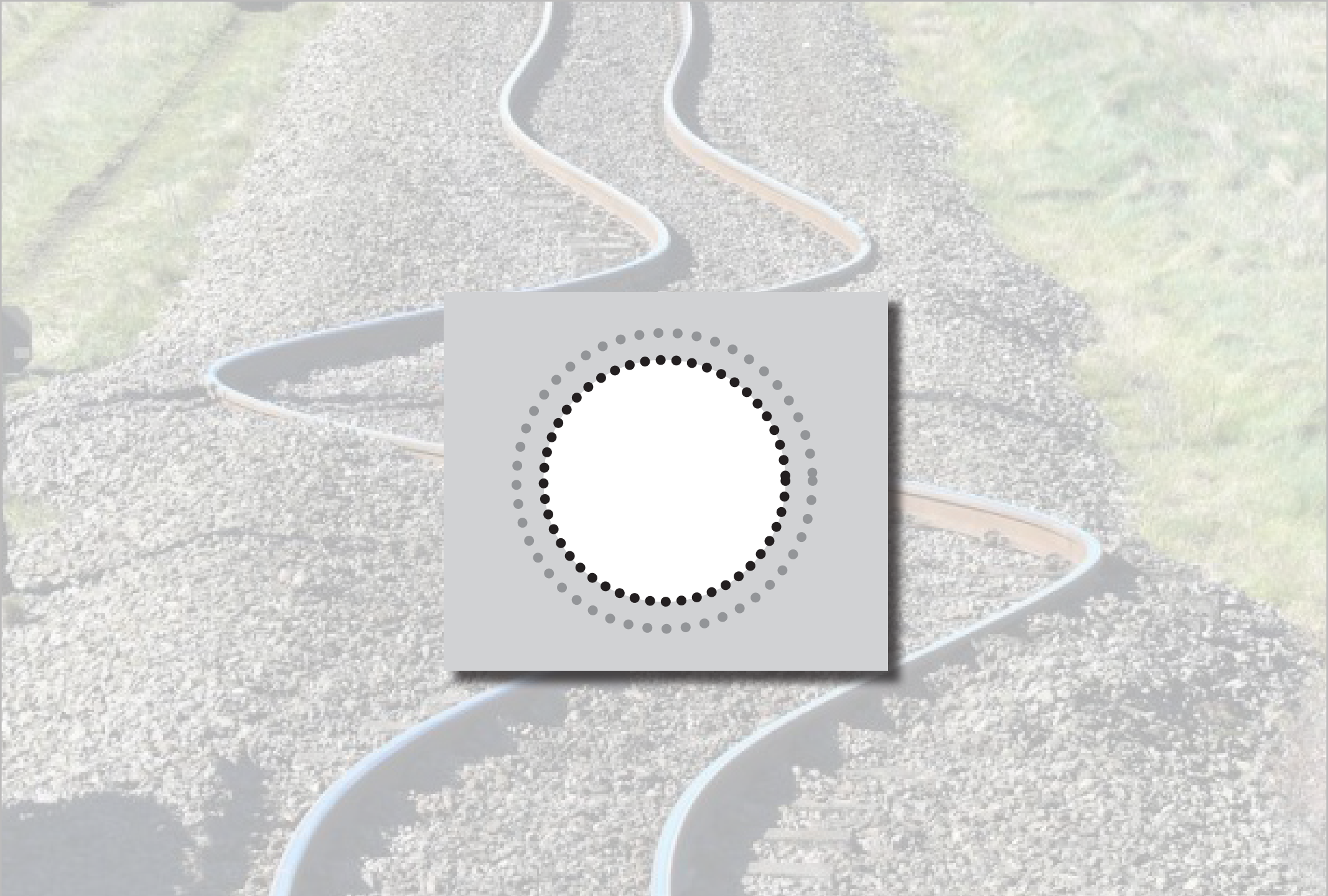
consider atoms at rim of hole



1 education

2 PI

3 test

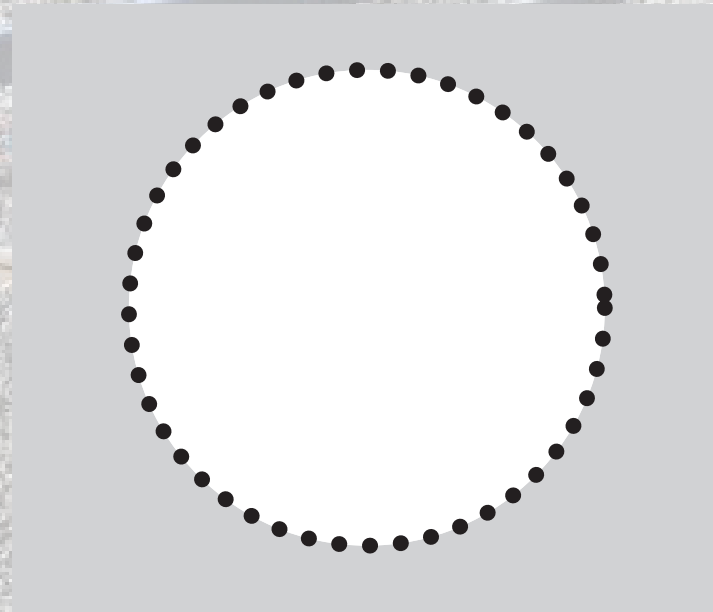


1 education

2 PI

3 test

consider atoms at rim of hole

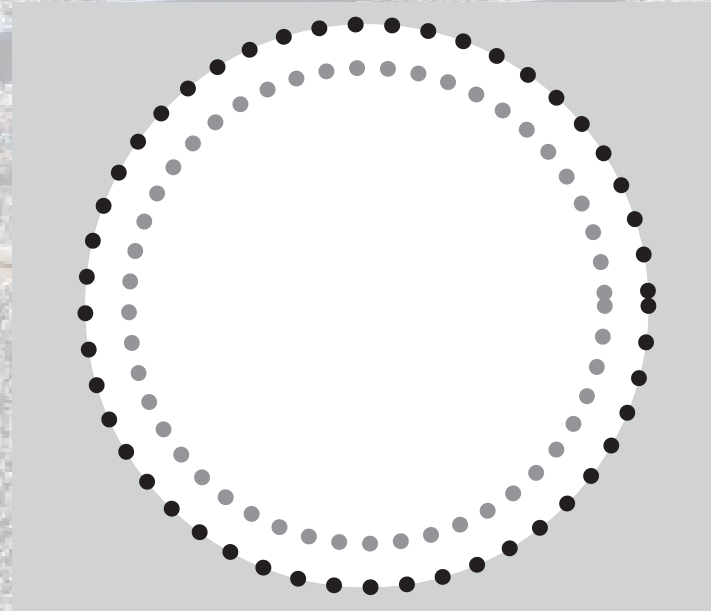


1 education

2 PI

3 test

consider atoms at rim of hole



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



1 education

2 PI

3 test

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

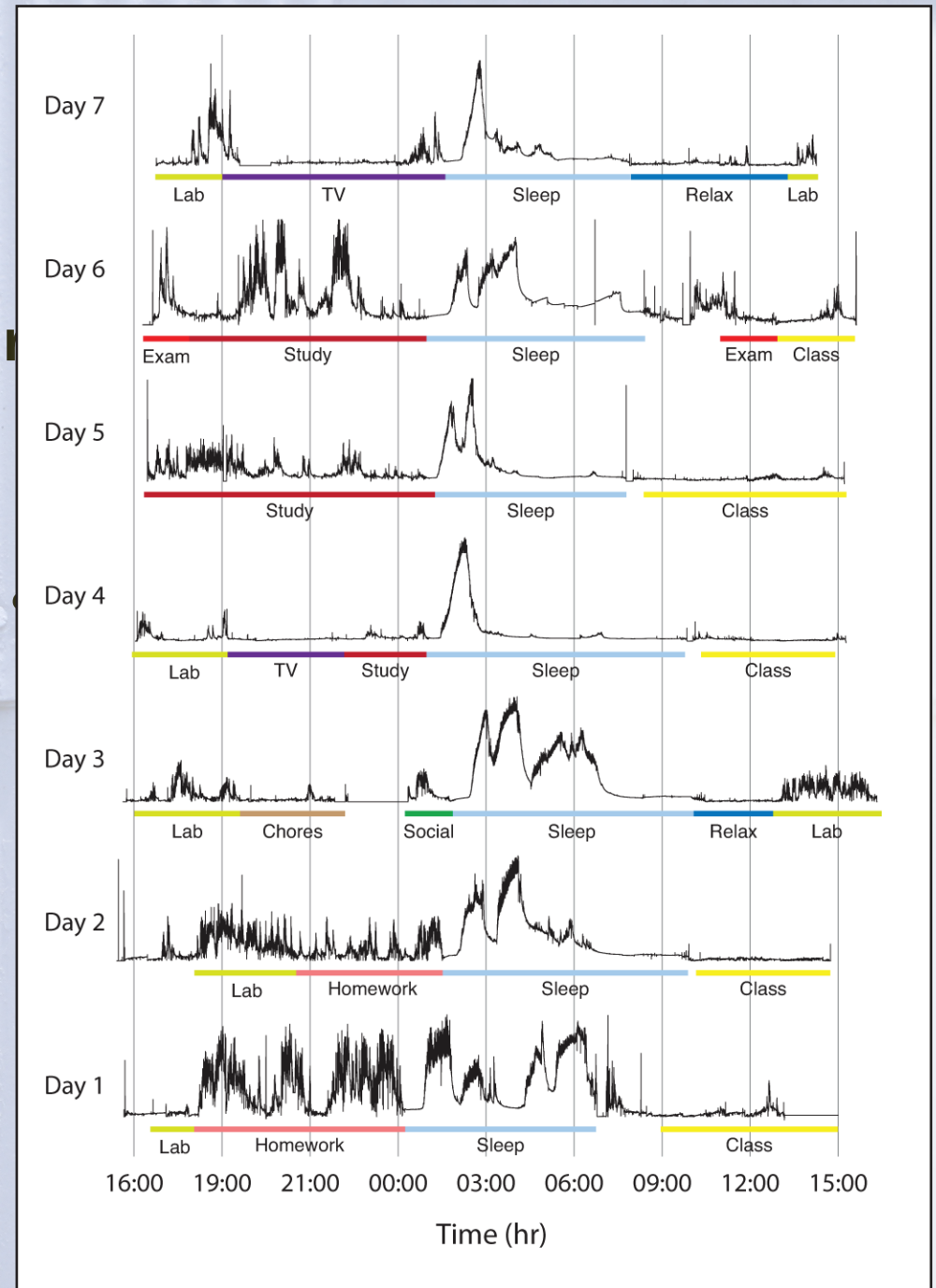
3 test

in a lecture, students...

1. don't pay utmost attention

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

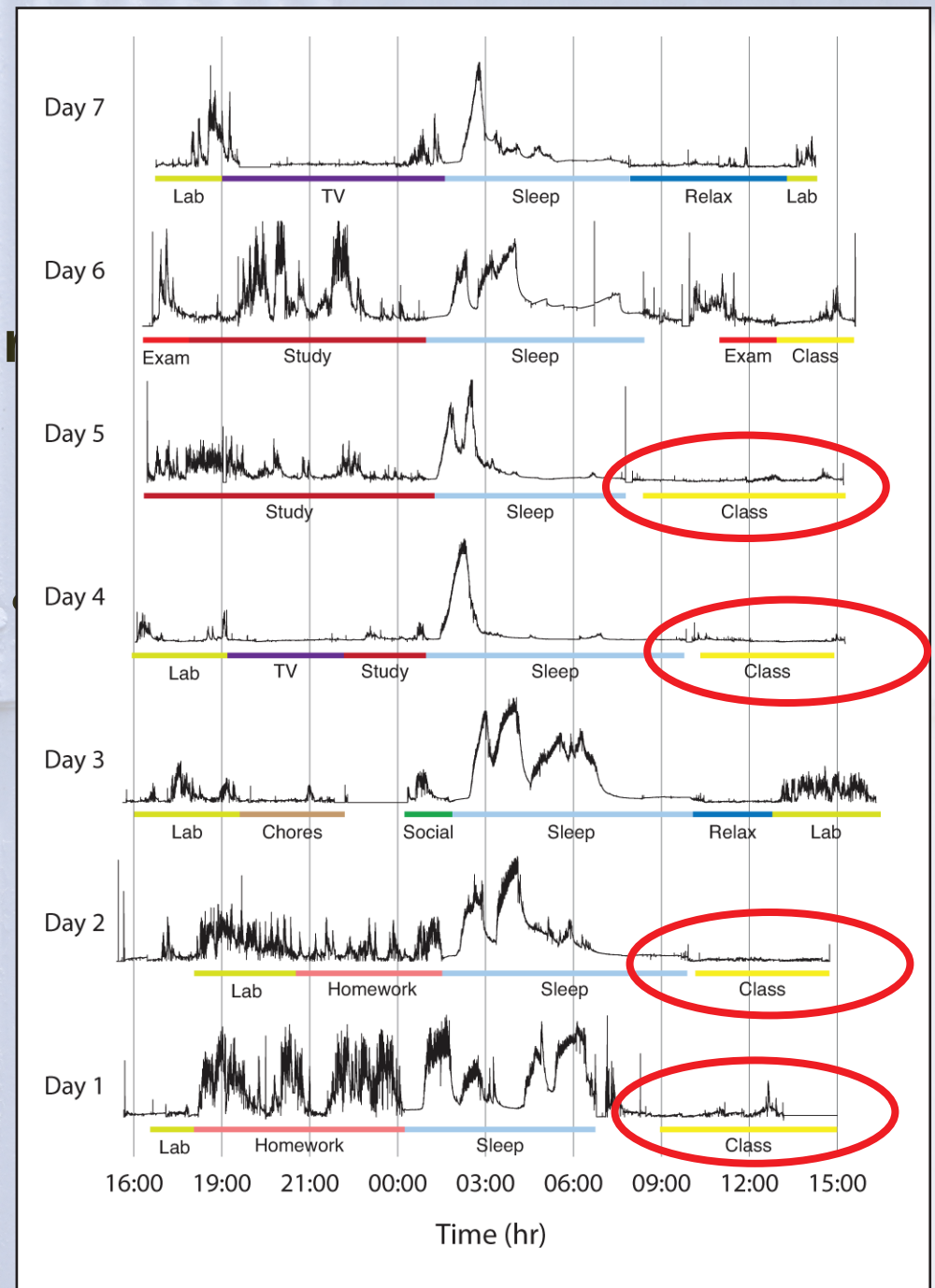
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

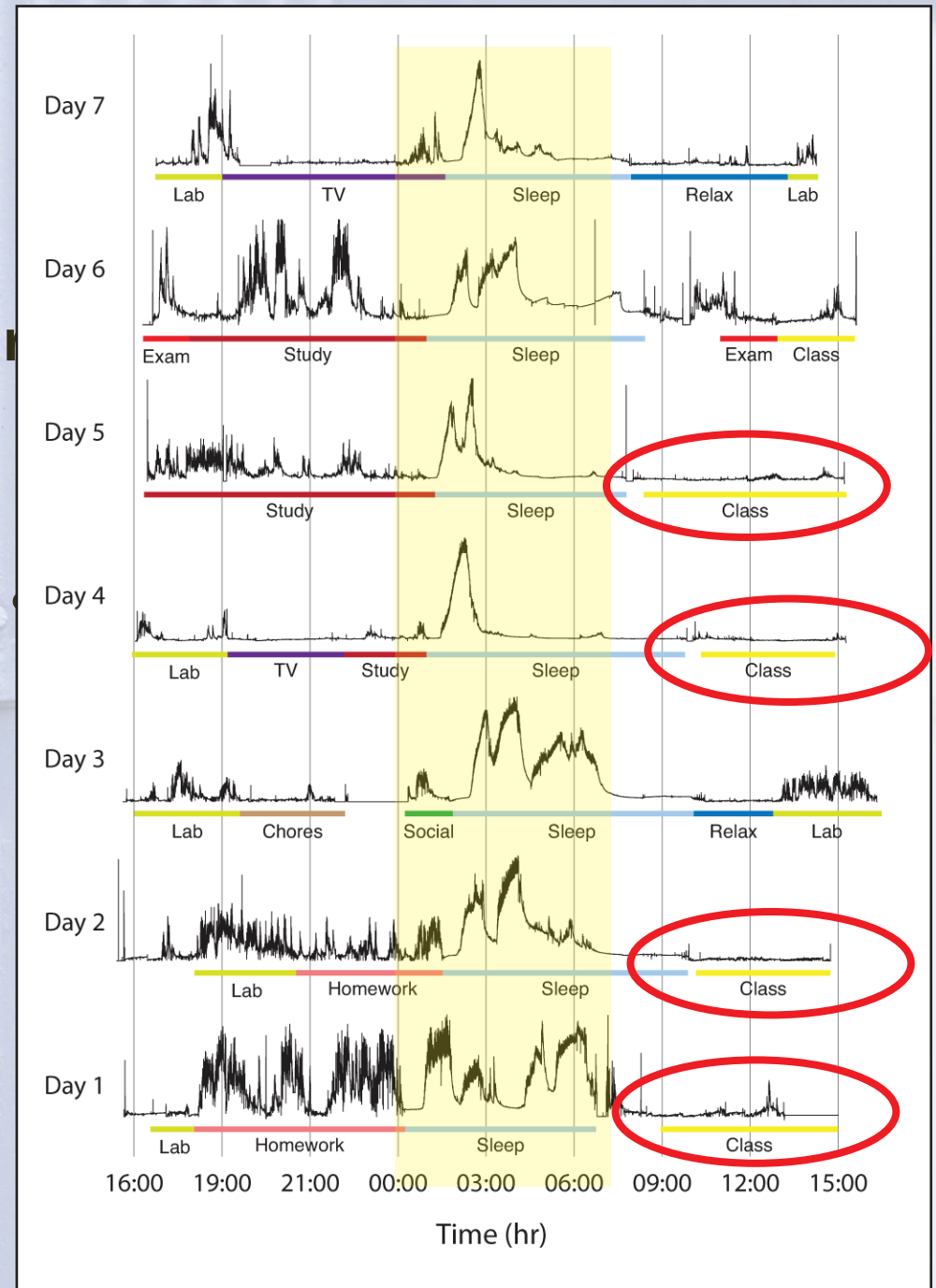
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

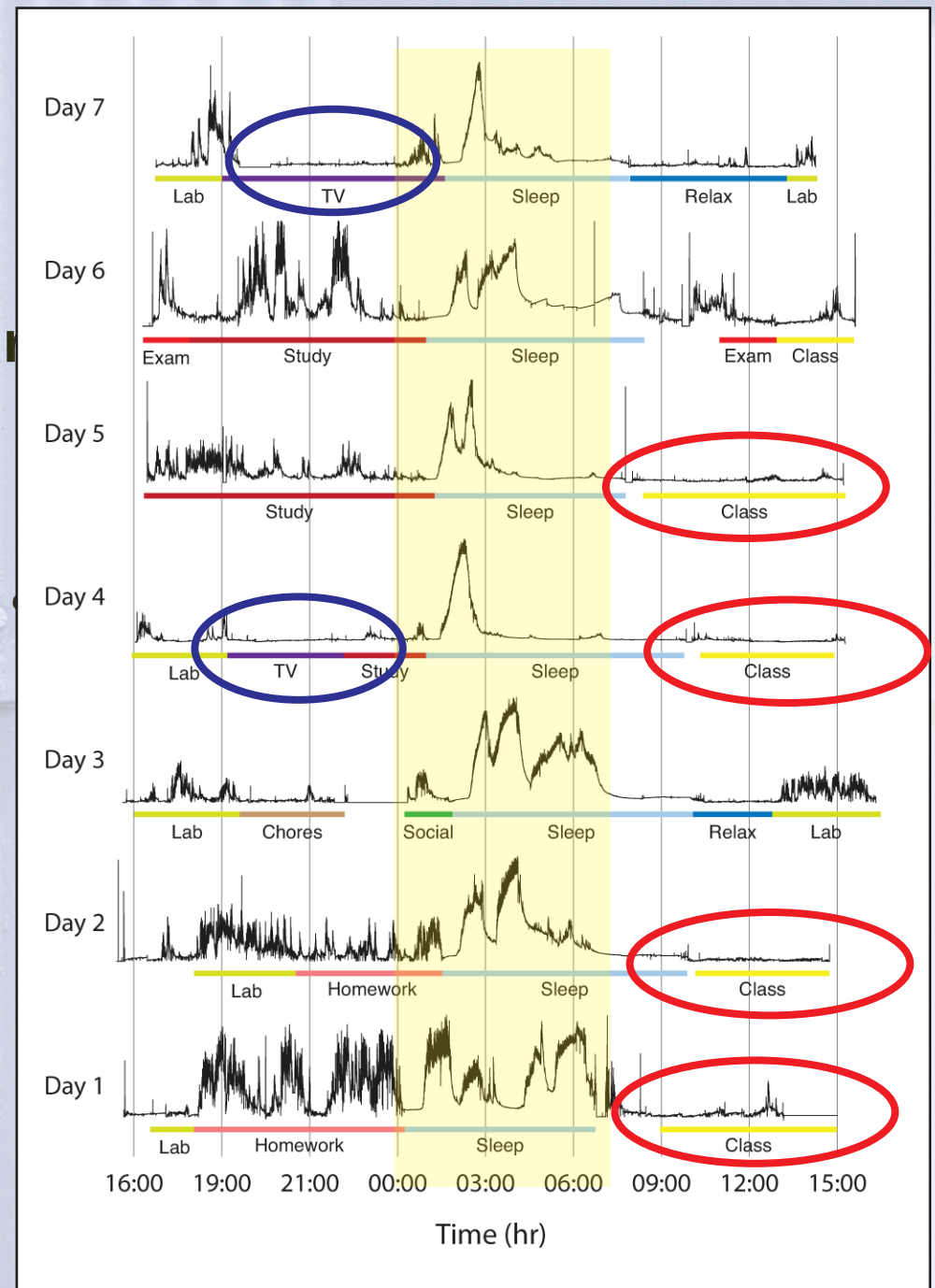
1 education

2 PI

3 test

in a lecture

1. don't pay utmost



doi: 10.1109/TBME.2009.2038487

1 education

2 PI

3 test

in a lecture, students...

1. don't pay utmost attention

2. think they know it



<http://www.babble.com>

1 education

2 PI

3 test

2 short video lectures on calico cats, same content

doi: 10.3758/s13423-013-0442-z

1 education

2 PI

3 test

2 short video lectures on calico cats, same content

fluent video



speaks fluidly w/o notes

upright

maintains eye contact

doi: 10.3758/s13423-013-0442-z

1 education

2 PI

3 test

2 short video lectures on calico cats, same content

fluent video



**speaks fluidly w/o notes
upright
maintains eye contact**

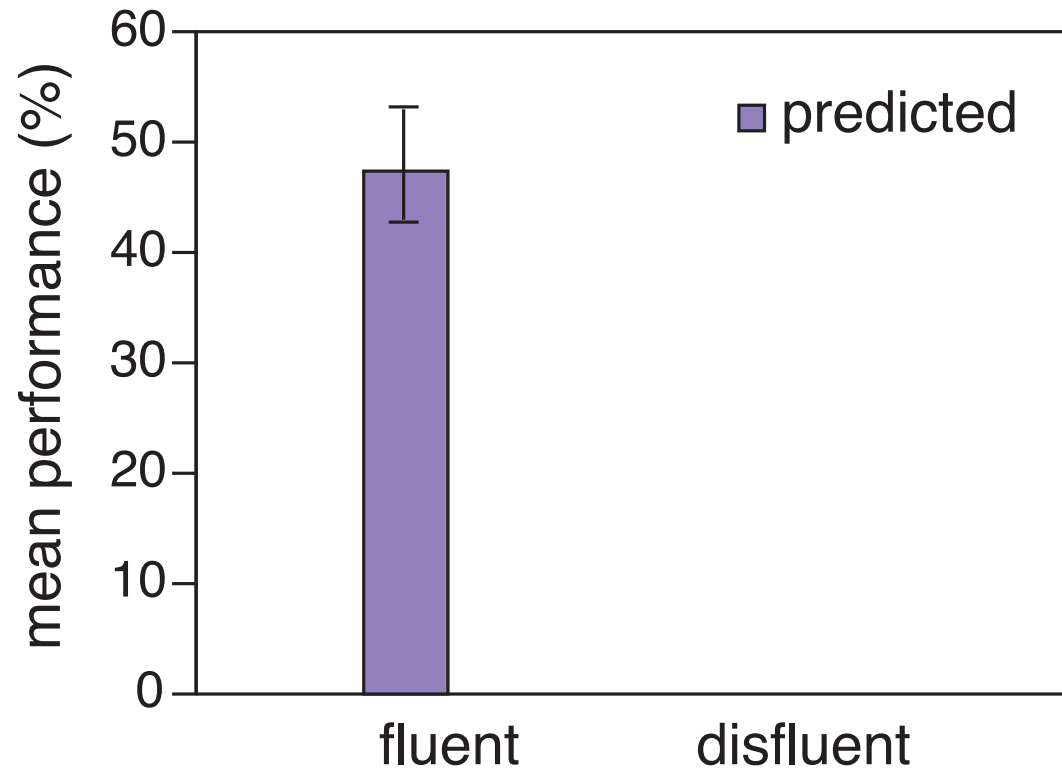
disfluent video



**speaks haltingly from notes
slumped
looks away**

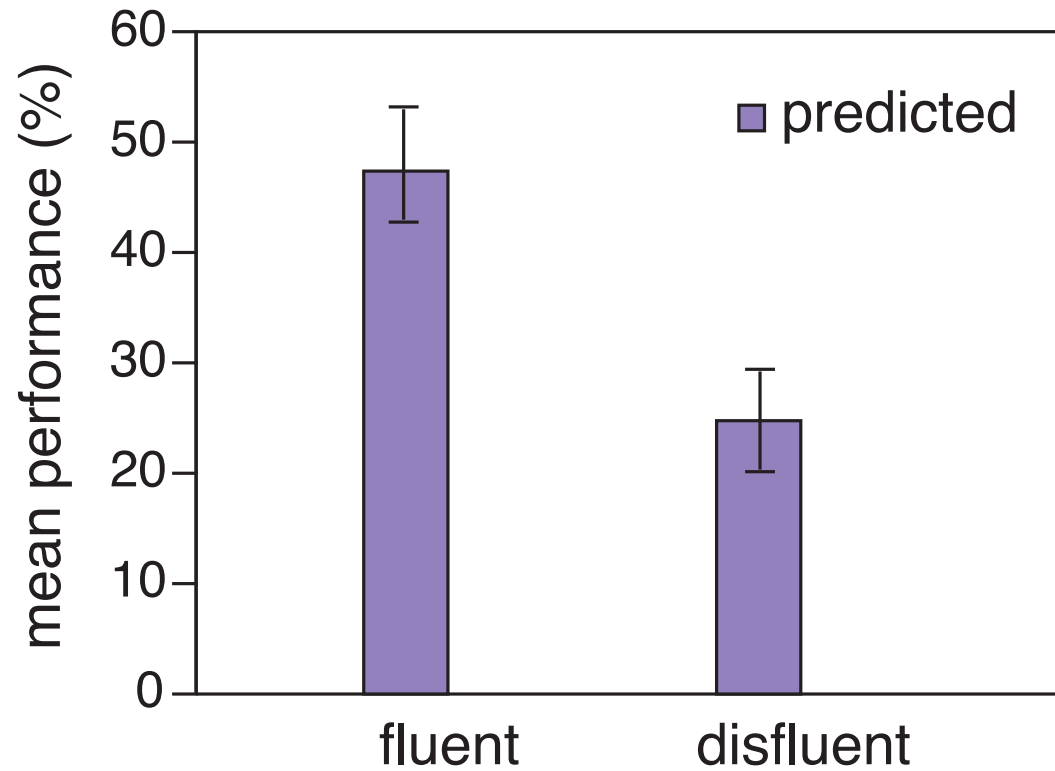
doi: 10.3758/s13423-013-0442-z

judgement of learning



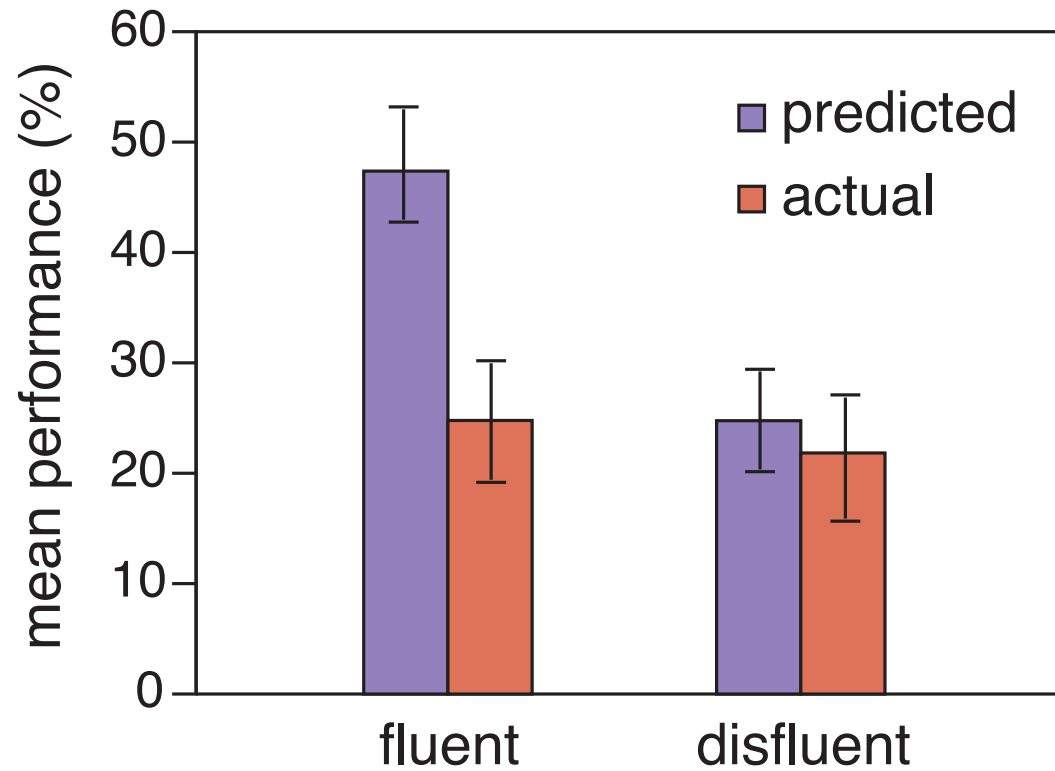
doi: 10.3758/s13423-013-0442-z

judgement of learning



doi: 10.3758/s13423-013-0442-z

judgement of learning



doi: 10.3758/s13423-013-0442-z

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

The background is a faded, classical-style painting of a face. The face is composed of several distinct eyes stacked vertically, creating a complex, multi-eyed illusion. The colors are muted, with shades of blue, yellow, and red. The text 'an illusion...' is overlaid in a bold, red, serif font.

an illusion. . .

1 education

2 PI

3 test



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**

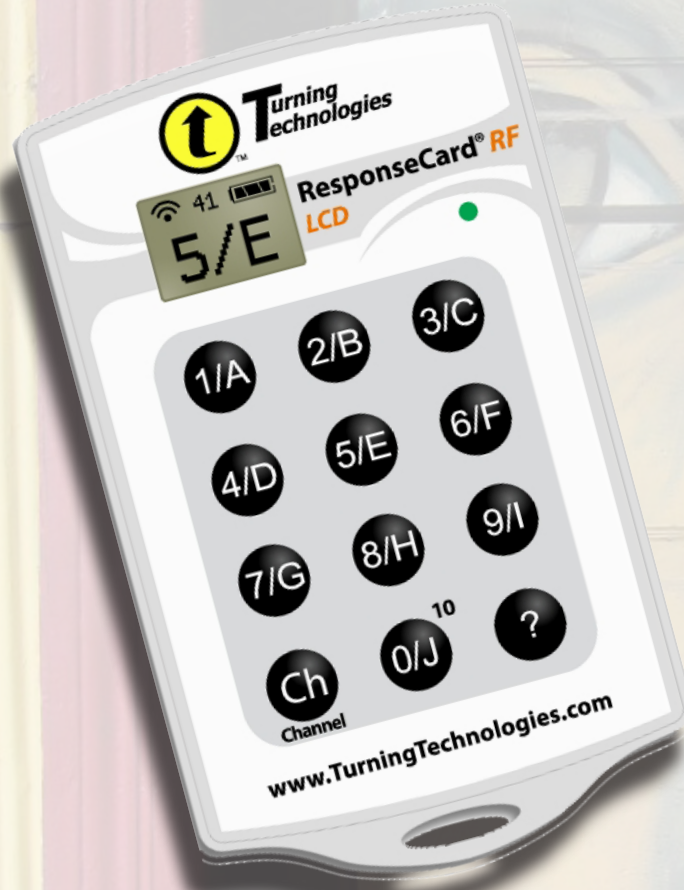
active participation a must!



Join now!

PeerInstruction.net

PLEASE RETURN YOUR CLICKER!



1 education

2 PI

3 test

Funding:

National Science Foundation

for a copy of this presentation:

mazur.harvard.edu

Follow me!



[eric_mazur](https://twitter.com/eric_mazur)

Google™

Google Search

I'm Feeling Lucky

Google™

mazur

Google Search

I'm Feeling Lucky



mazur

Google Search

I'm Feeling Lucky

Google™

mazur

Google Search

I'm Feeling Lucky

Funding:

National Science Foundation

for a copy of this presentation:

mazur.harvard.edu

Follow me!



eric_mazur