Peer Instruction Workshop

Indian Institute of Technology Bombay
Mumbai, India, 11 November 2013

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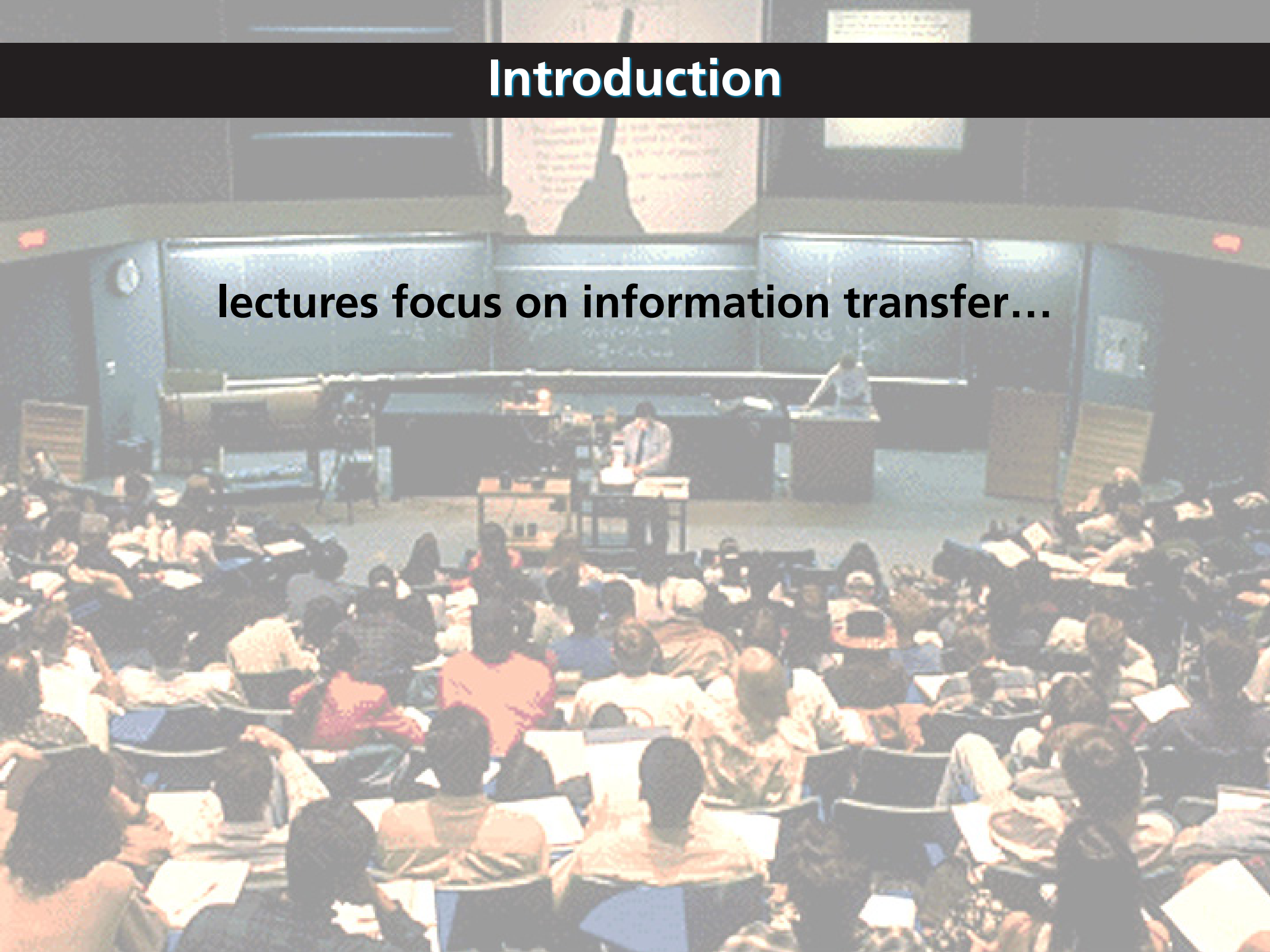
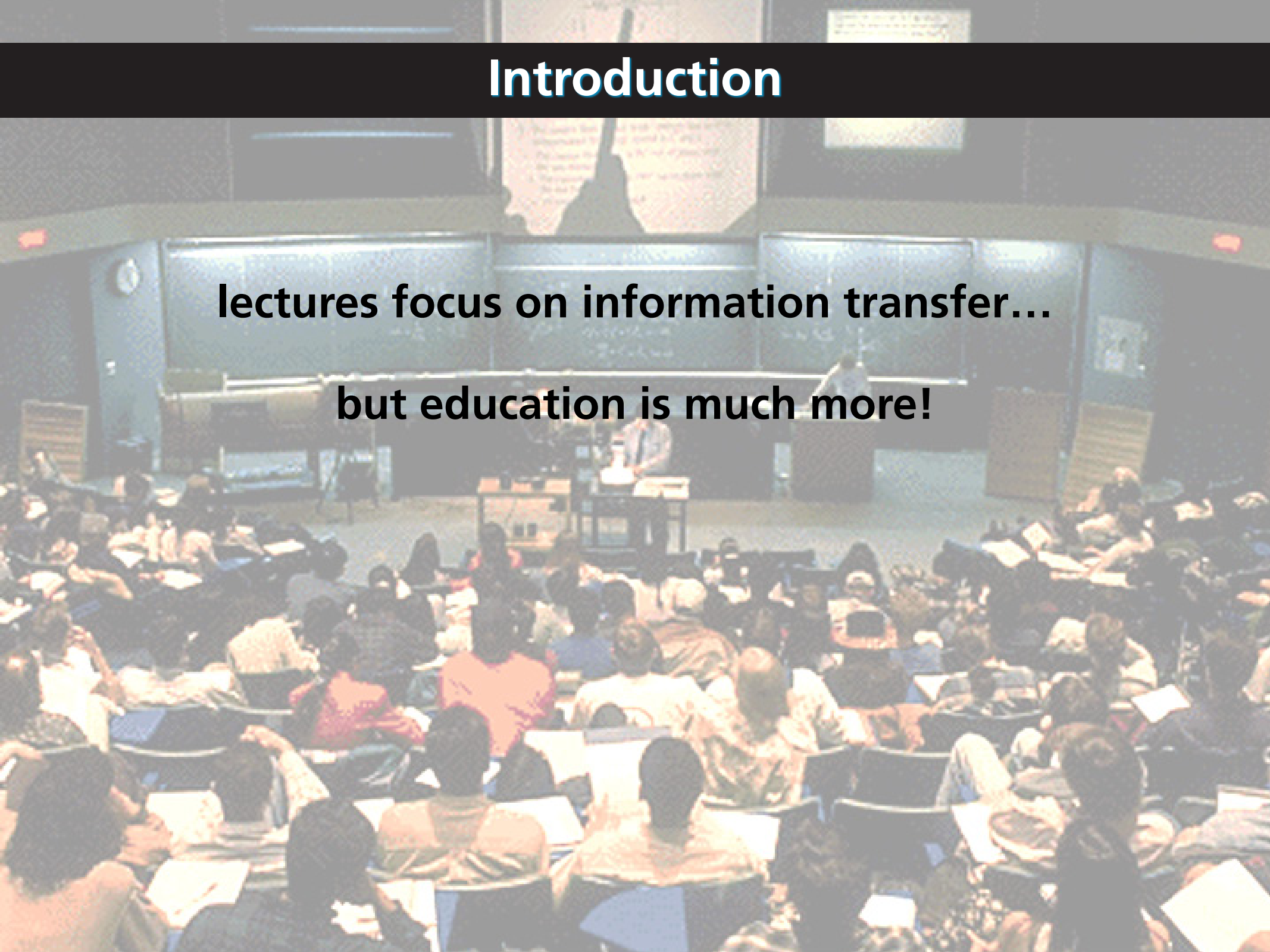
Introduction



lectures focus on information transfer…

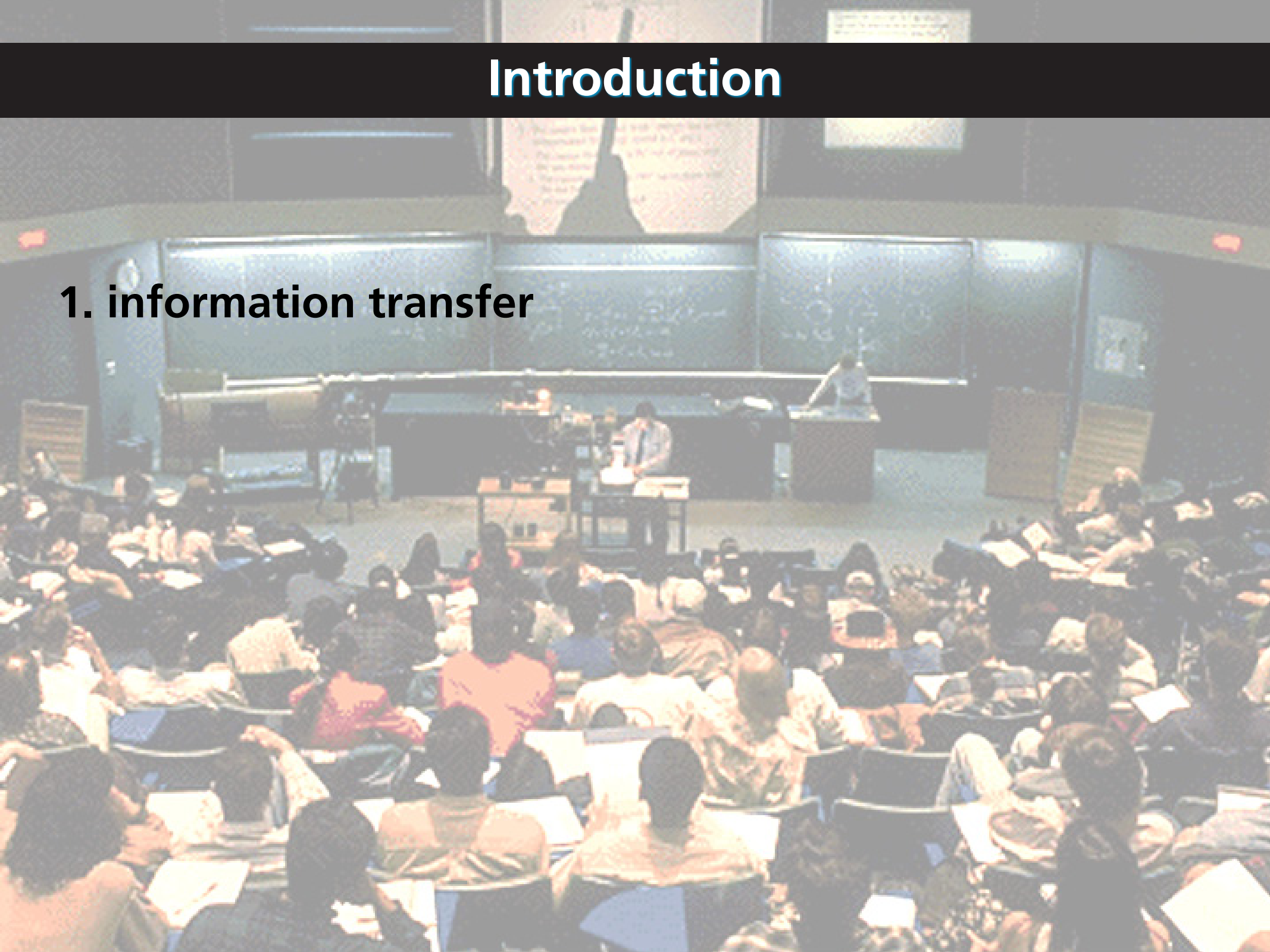
Introduction



lectures focus on information transfer…

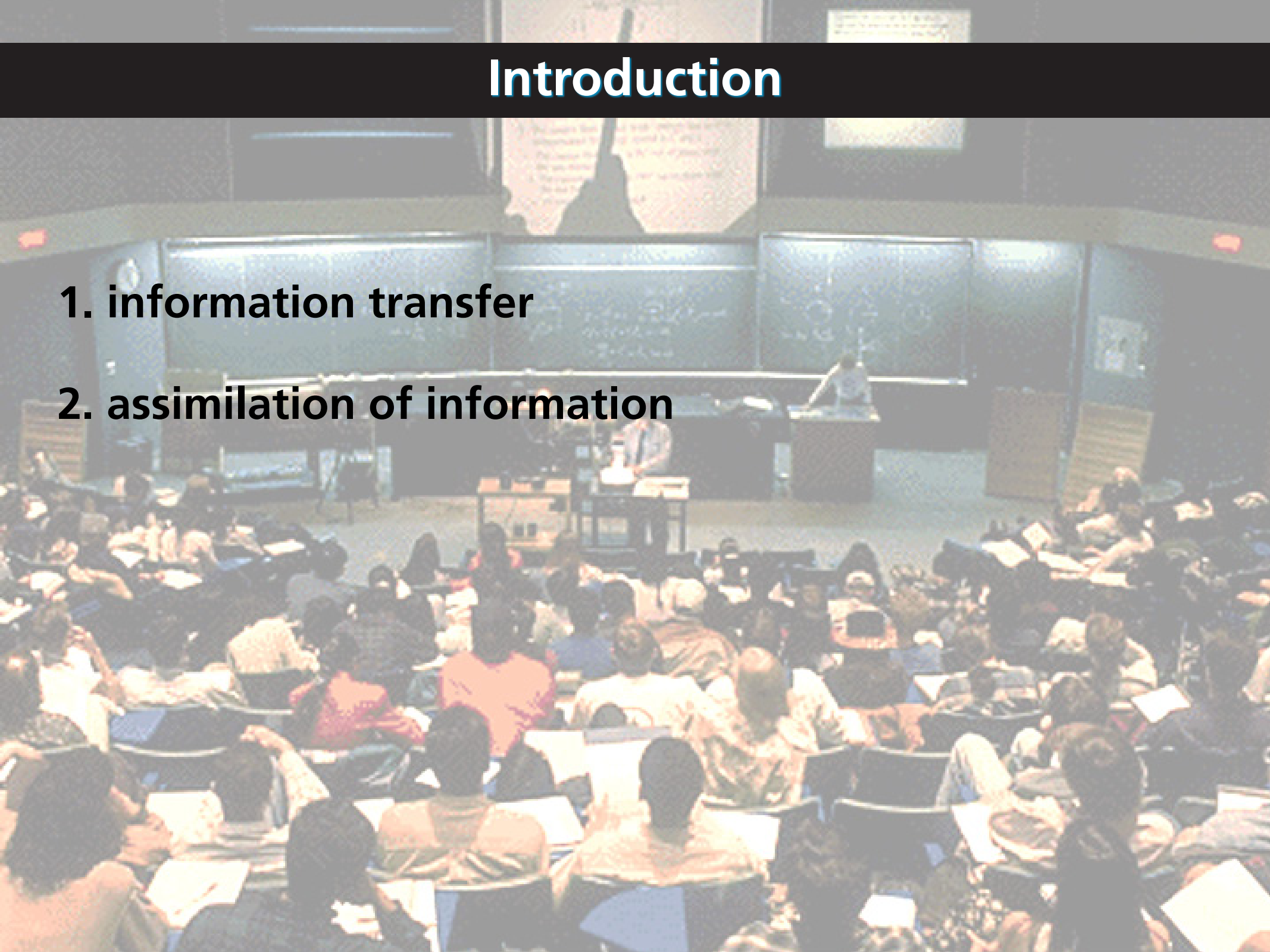
but education is much more!

Introduction



1. information transfer

Introduction



1. information transfer

2. assimilation of information

Introduction

1. information transfer (easy)

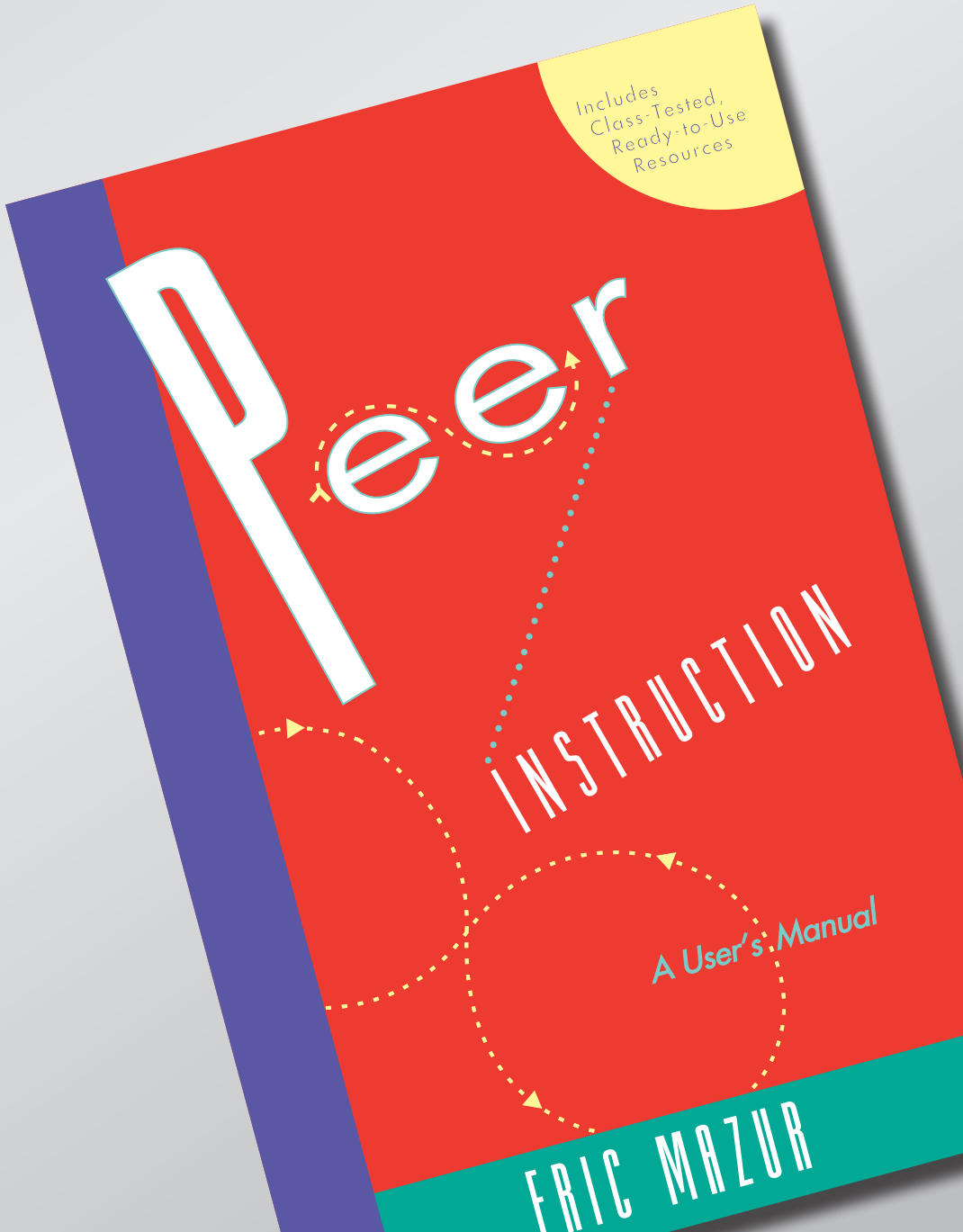
2. assimilation of information (hard and left to student)

Introduction

Solution: move information transfer out of classroom!

Introduction

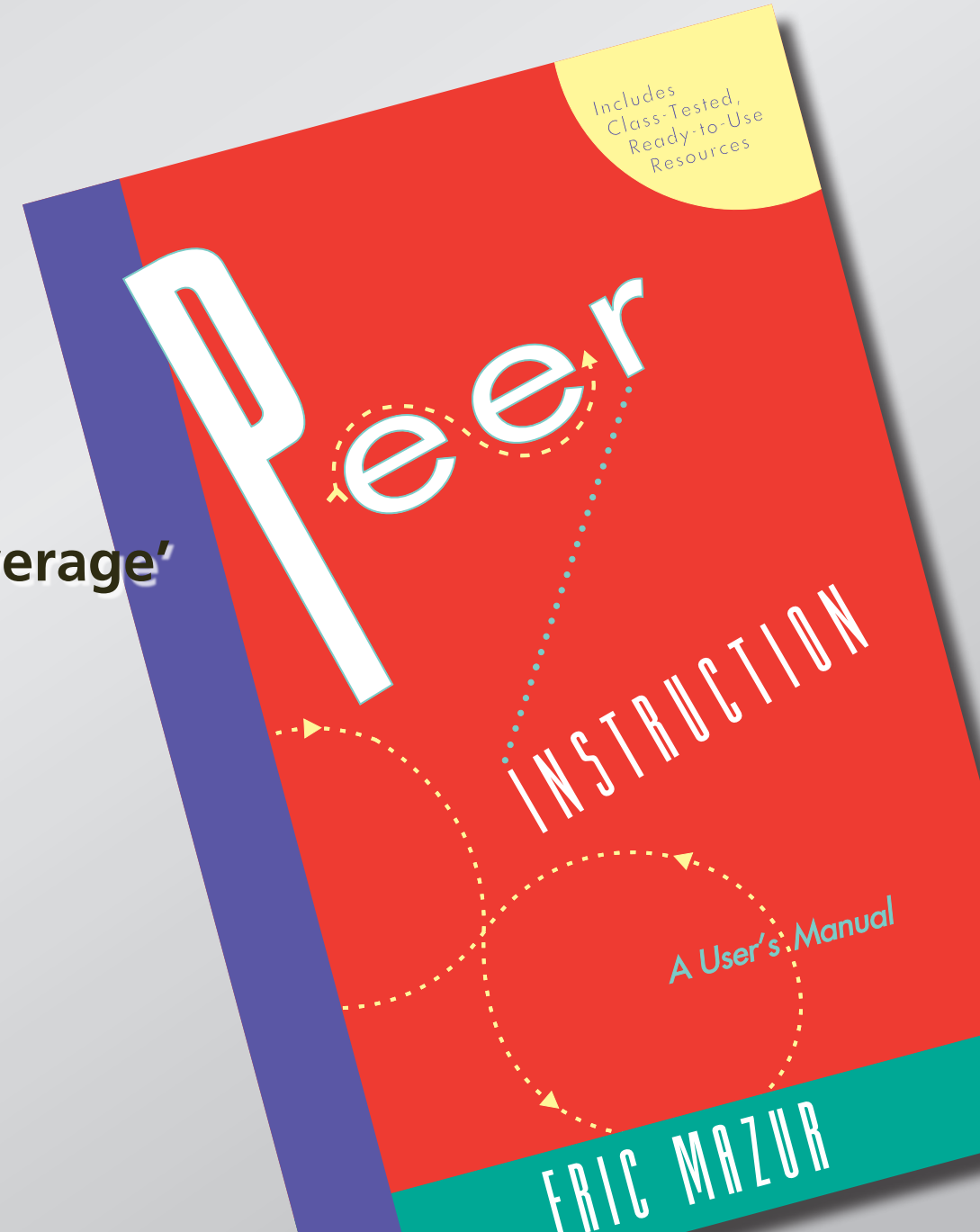
Peer Instruction (PI)



Introduction

Main features:

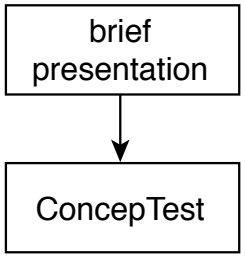
- pre-class assignment
- in-class: depth, not ‘coverage’
- ConcepTests



Introduction

brief
presentation

Introduction



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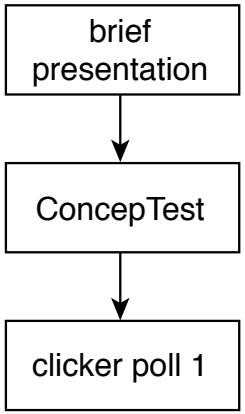

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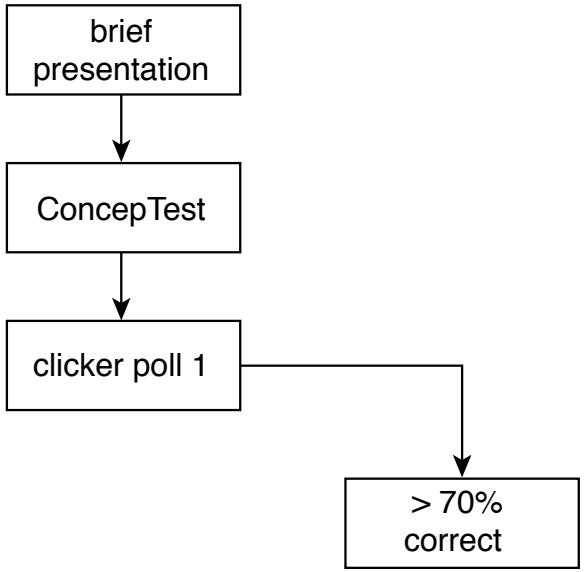

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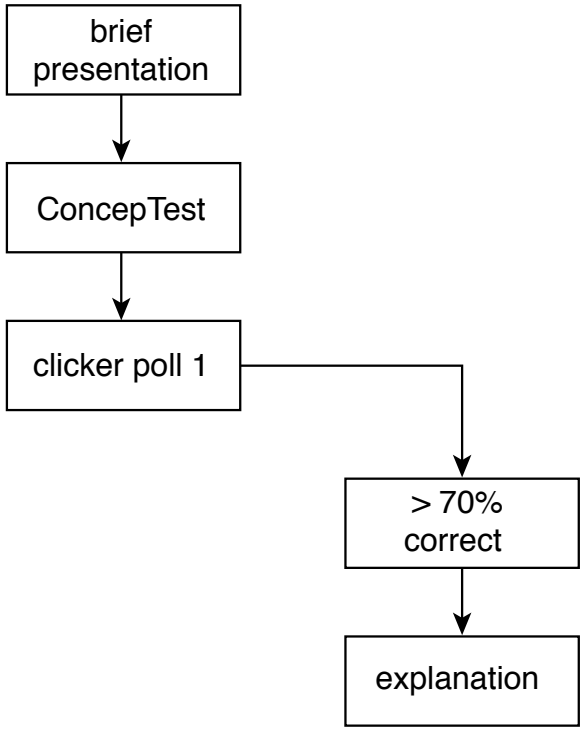

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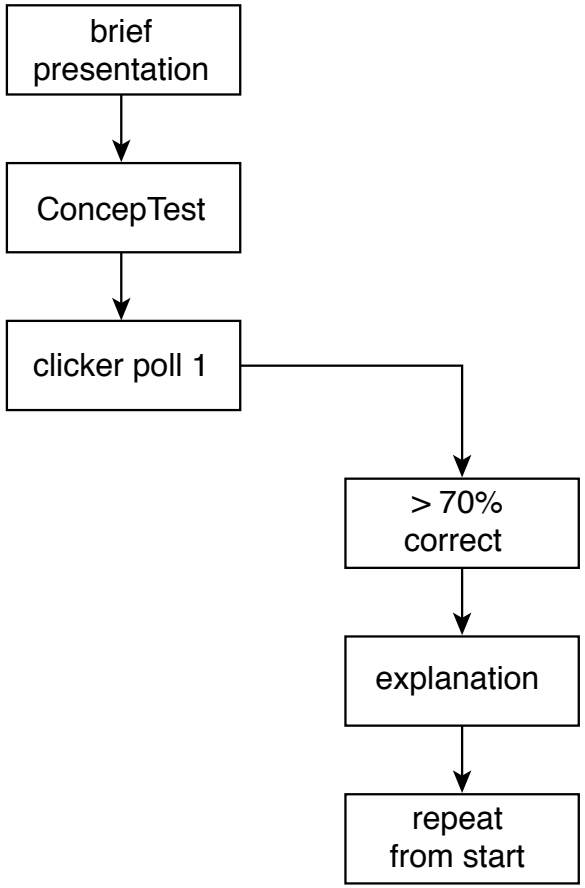

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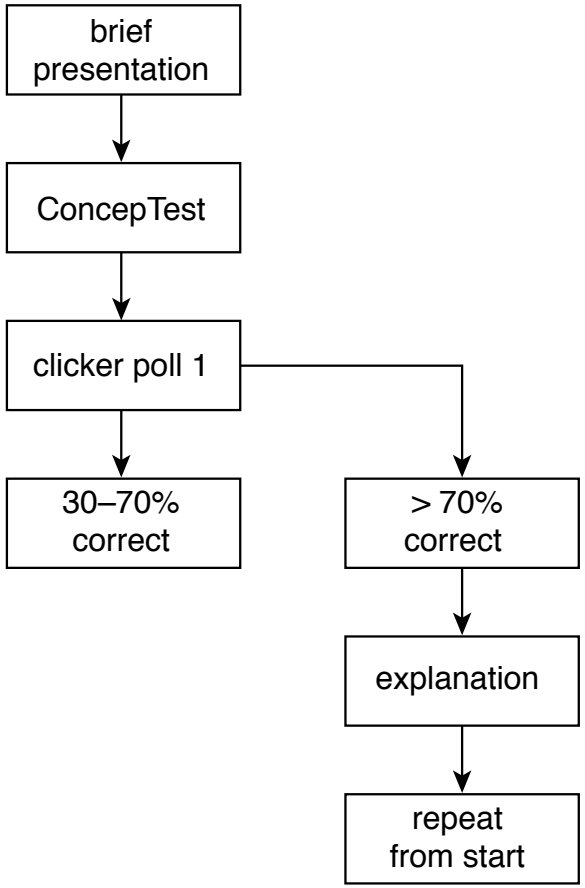

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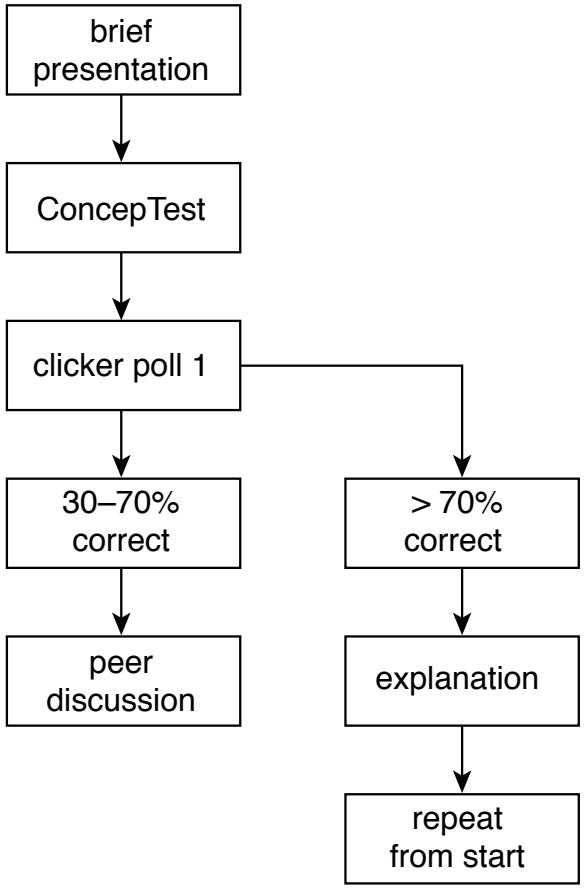

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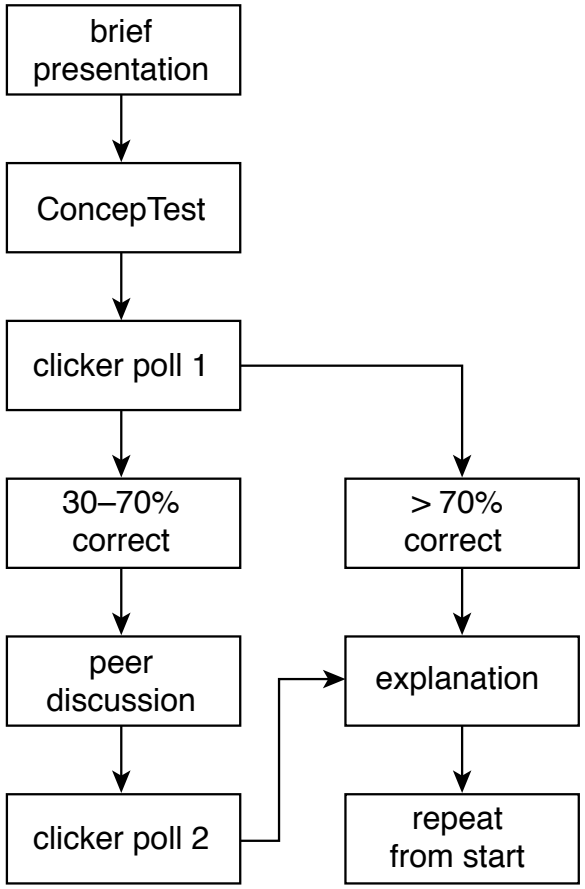

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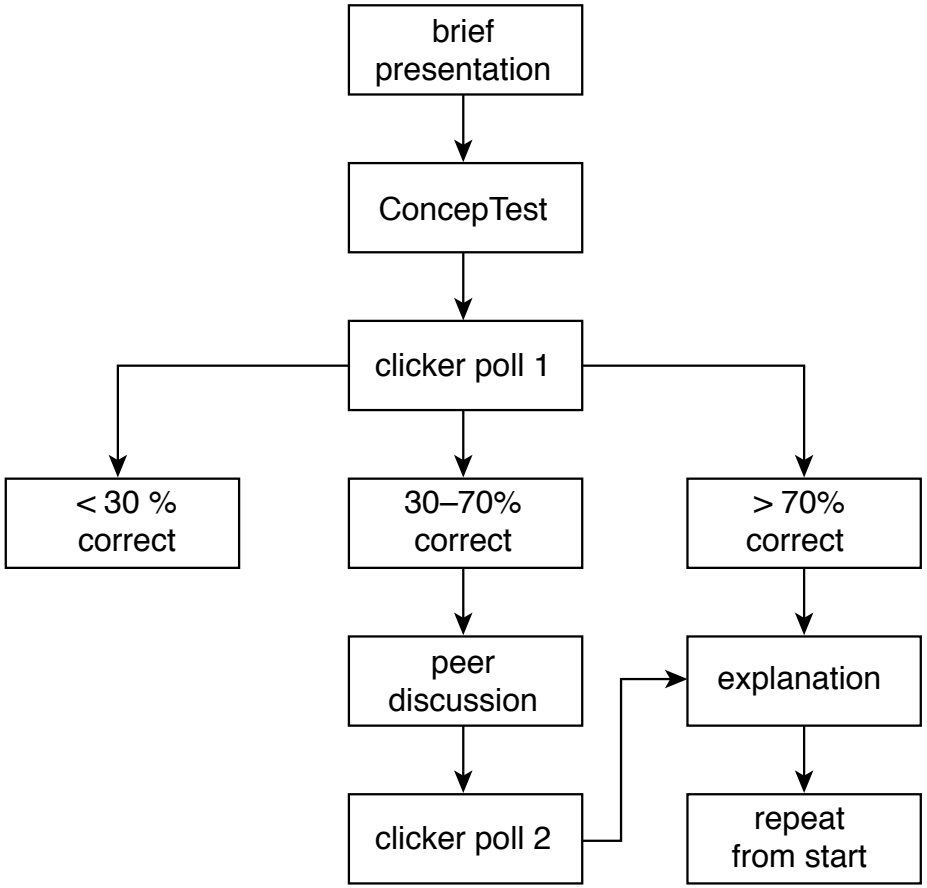

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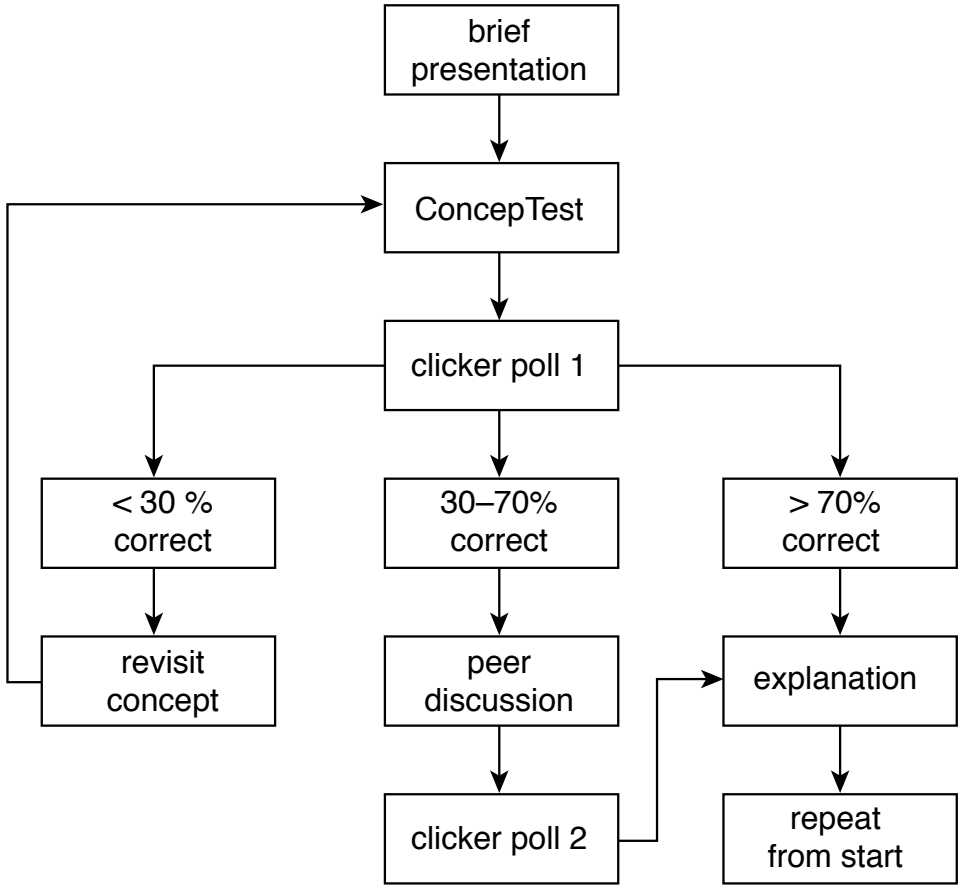

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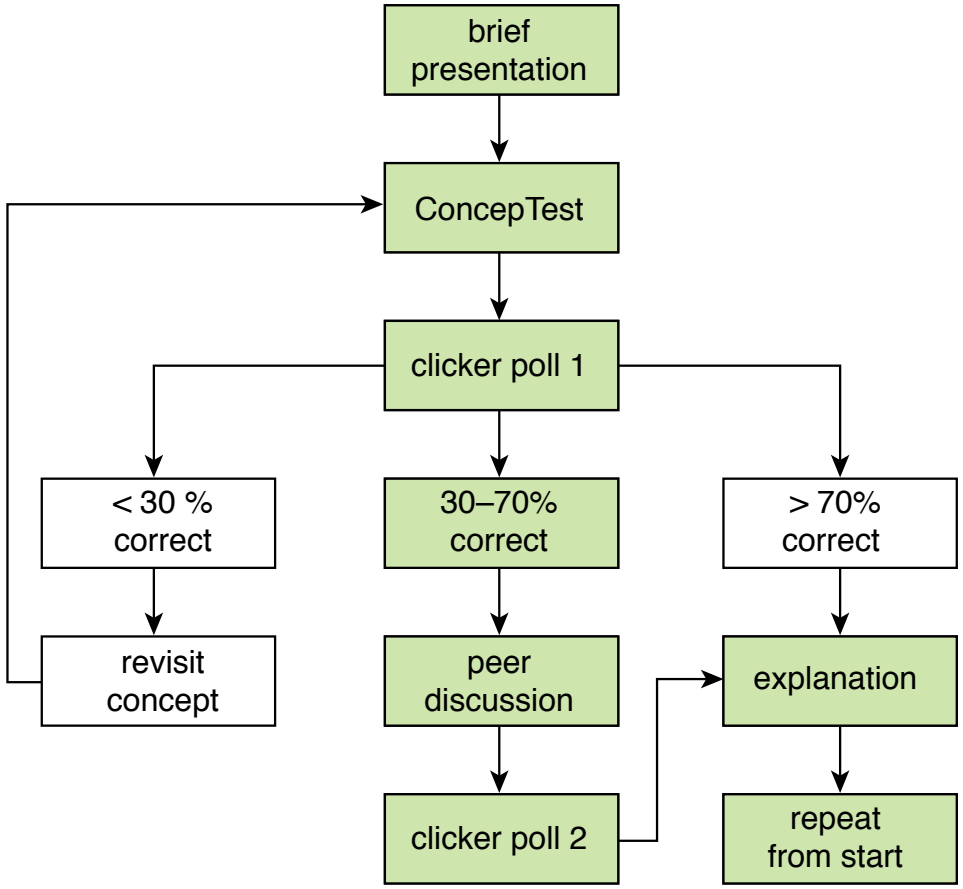
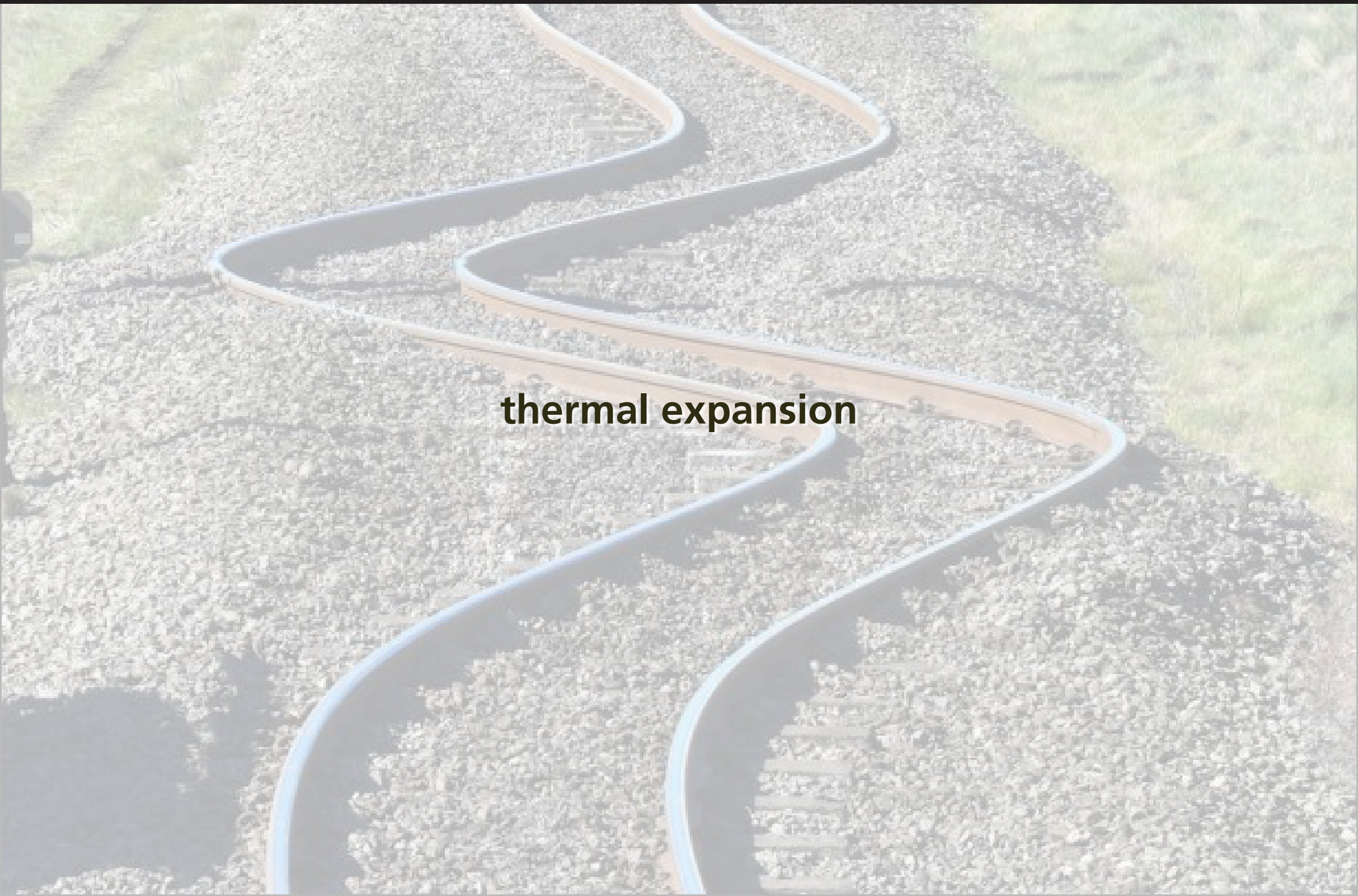


Introduction

PI:

- helps students overcome difficulties
- encourages deep learning
- provides depth, not “coverage”
- helps you become aware of misconceptions

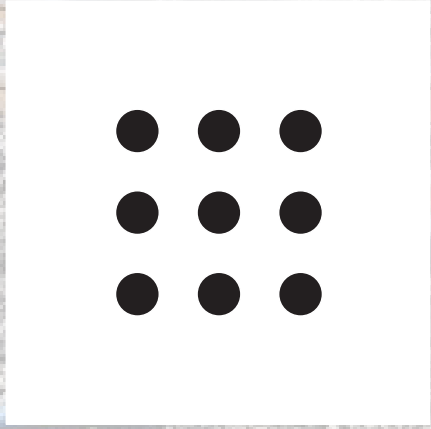
Let's try it!



thermal expansion

Let's try it!

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



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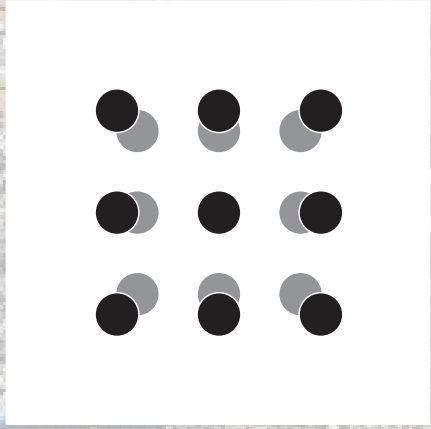
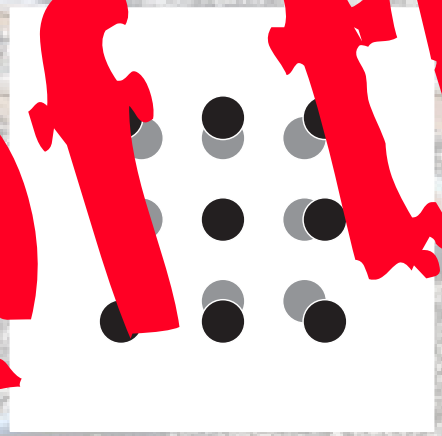


Let's try it!

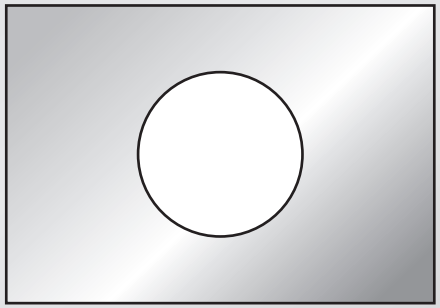
When metals heat up, they expand because all atoms get farther away from each other.

all of them!



Let's try it!

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



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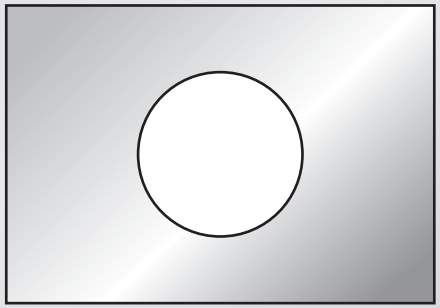


When the plate is uniformly heated, the diameter of the hole

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

Let's try it!

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

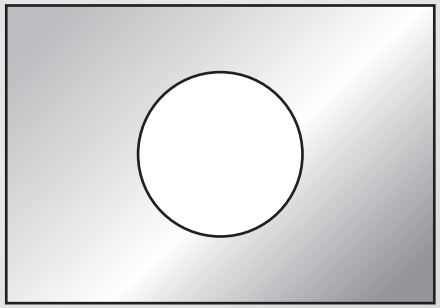
When the plate is uniformly heated, the diameter of the hole

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!

Before I tell you the answer…

Let’s try it!

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

Let's try it!

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

You…

Let's try it!

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

You…

1. made a commitment

Let's try it!

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

You…

1. made a commitment
2. externalized your answer

Let's try it!

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

Let's try it!

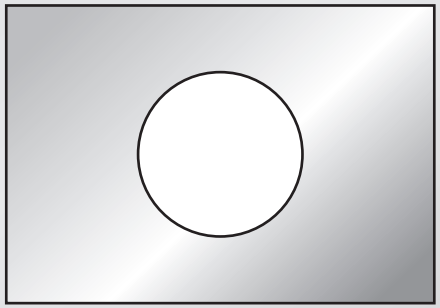
Before I tell you the answer, let's analyze what happened.

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

Let's try it!

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



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Let's try it!

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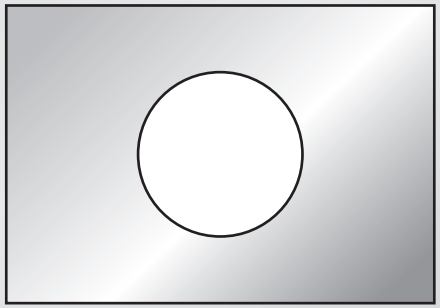
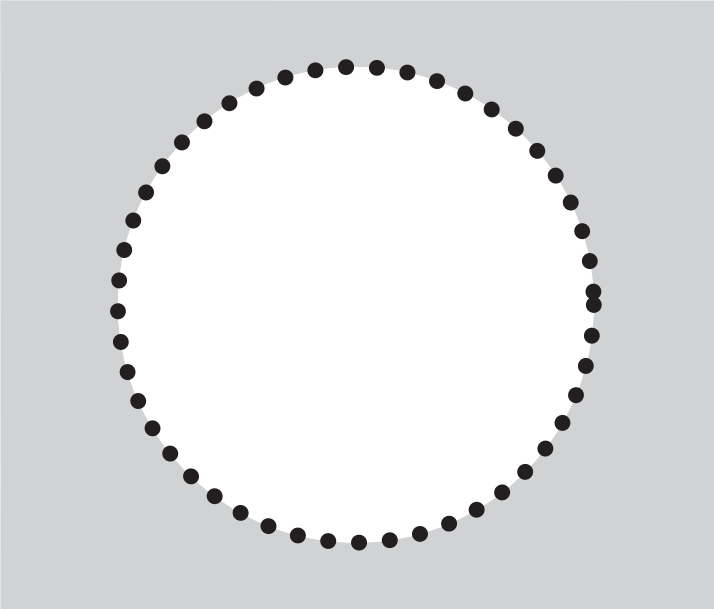


When the plate is uniformly heated, the diameter of the hole

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

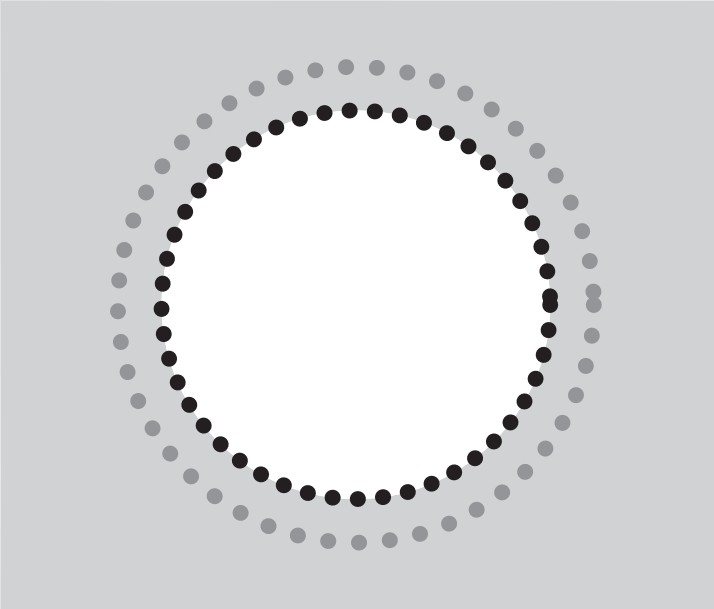
Let's try it!

consider the atoms at the rim of the hole



Let's try it!

consider the atoms at the rim of the hole



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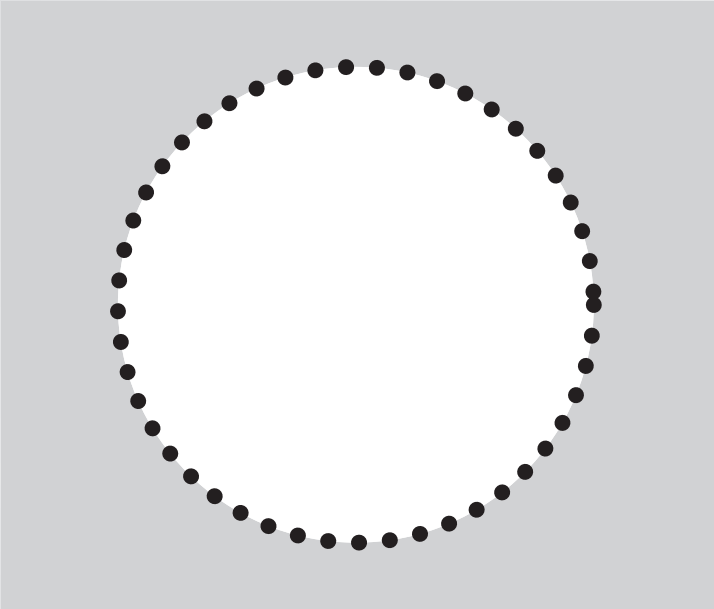

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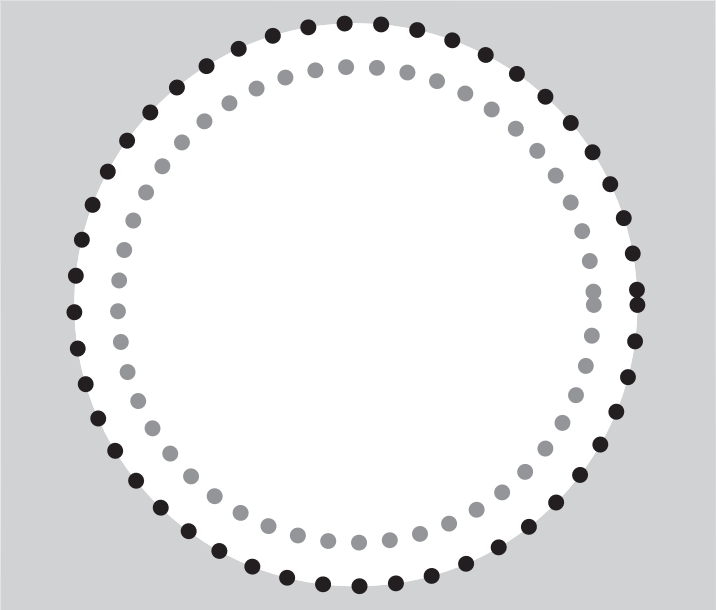


Let's try it!

consider the atoms at the rim of the hole

you won't forget this

Frequently Asked Questions

"How can I be sure that my students will prepare for class?"

Getting students to read

Students do not come to class prepared, because...

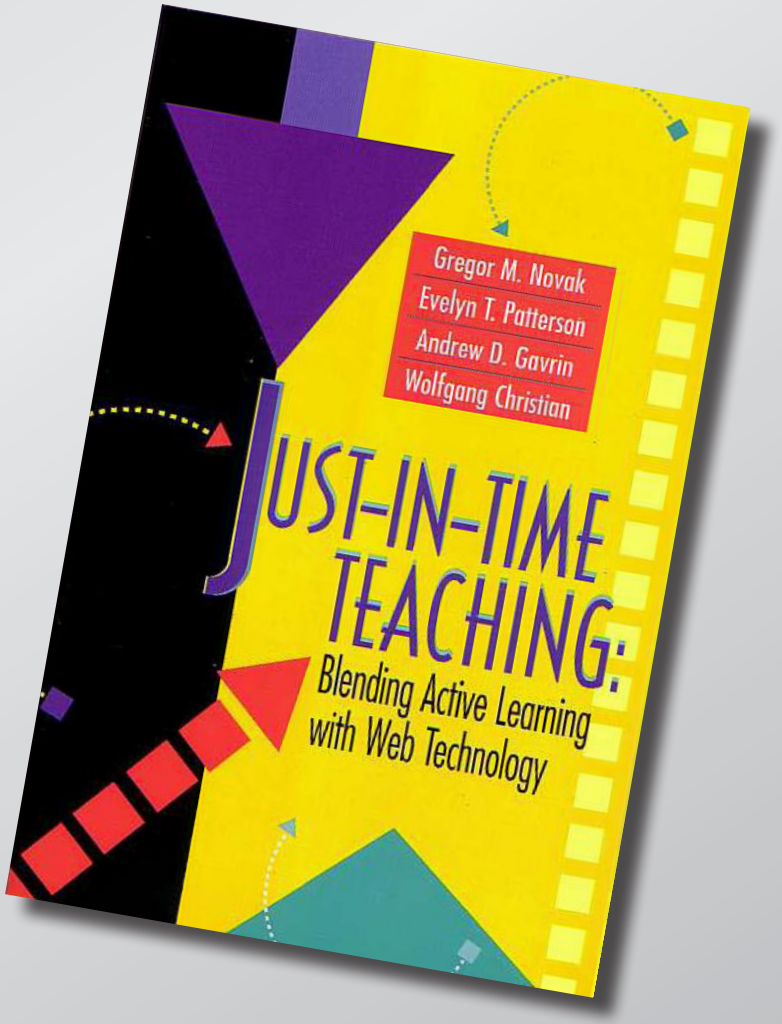
1. they don’t have time.
2. they are not motivated to learn.
3. their instructors take away the incentive.
4. they do not have the requisite skills.
5. of some other reason.
6. They do come prepared in my class!

(select what you consider to be the main reason)

Getting students to read

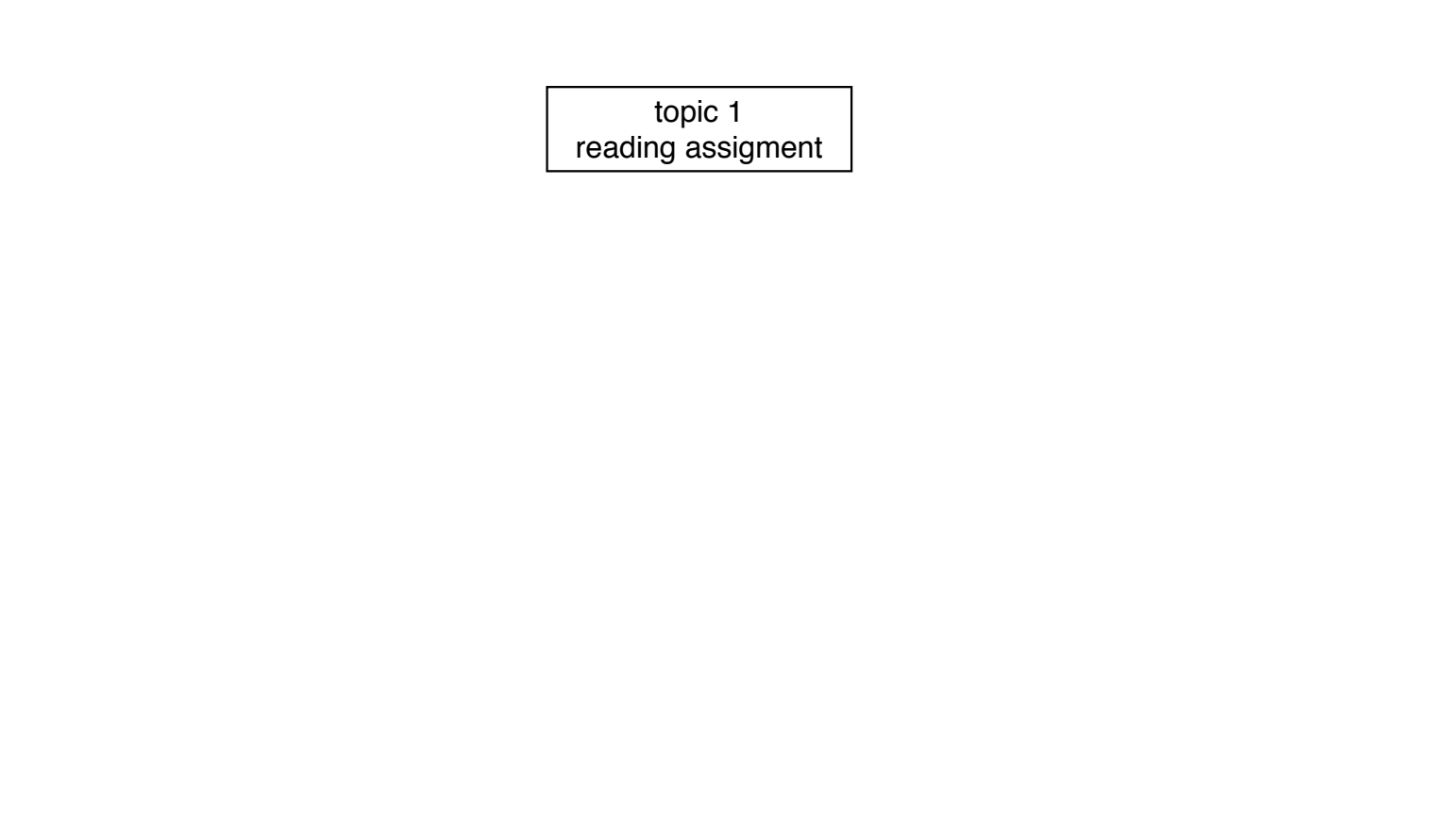
Just-in-time-Teaching (JiTT)

www.jitt.org



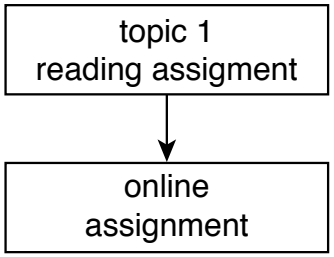
Getting students to read

JiTT workflow



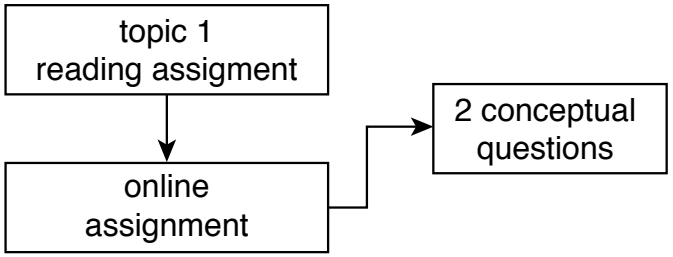
Getting students to read

JiTT workflow



Getting students to read

JiTT workflow



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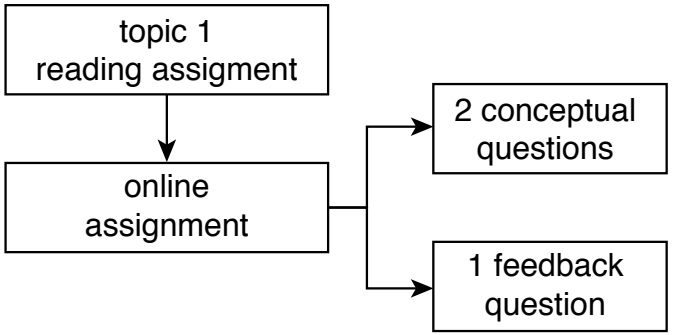

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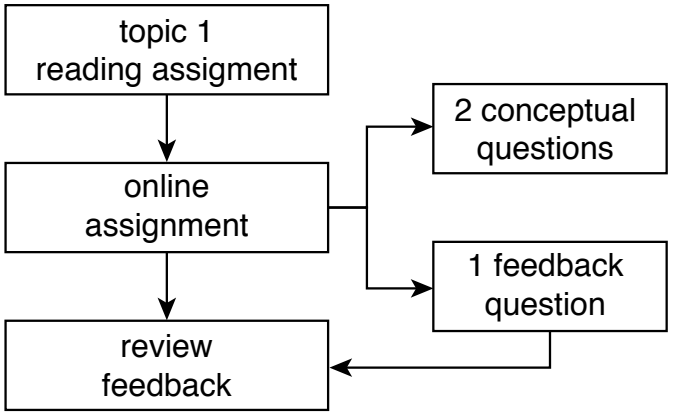

Getting students to read

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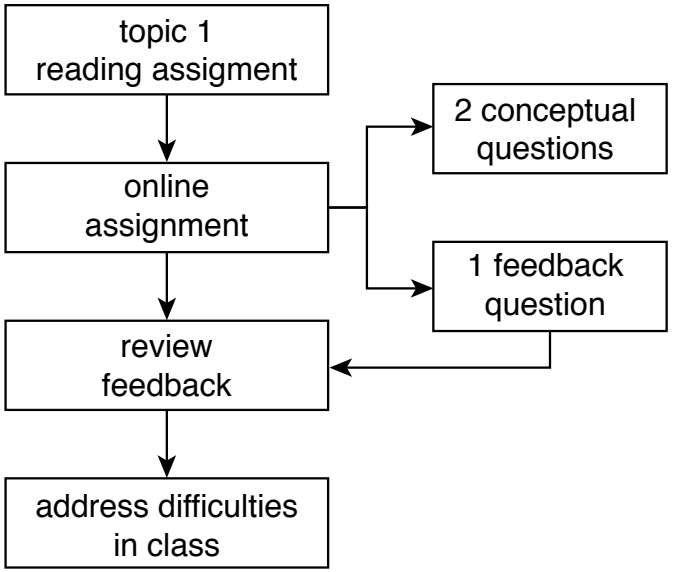
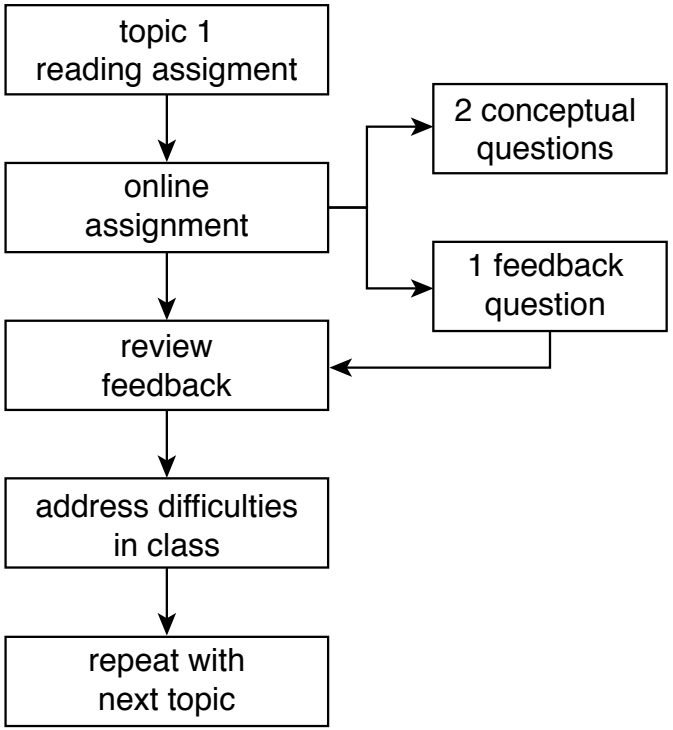


Getting students to read

JiTT workflow



Getting students to read

JiTT:

- prepares you for class
- prepares students for class
- helps you address student difficulties

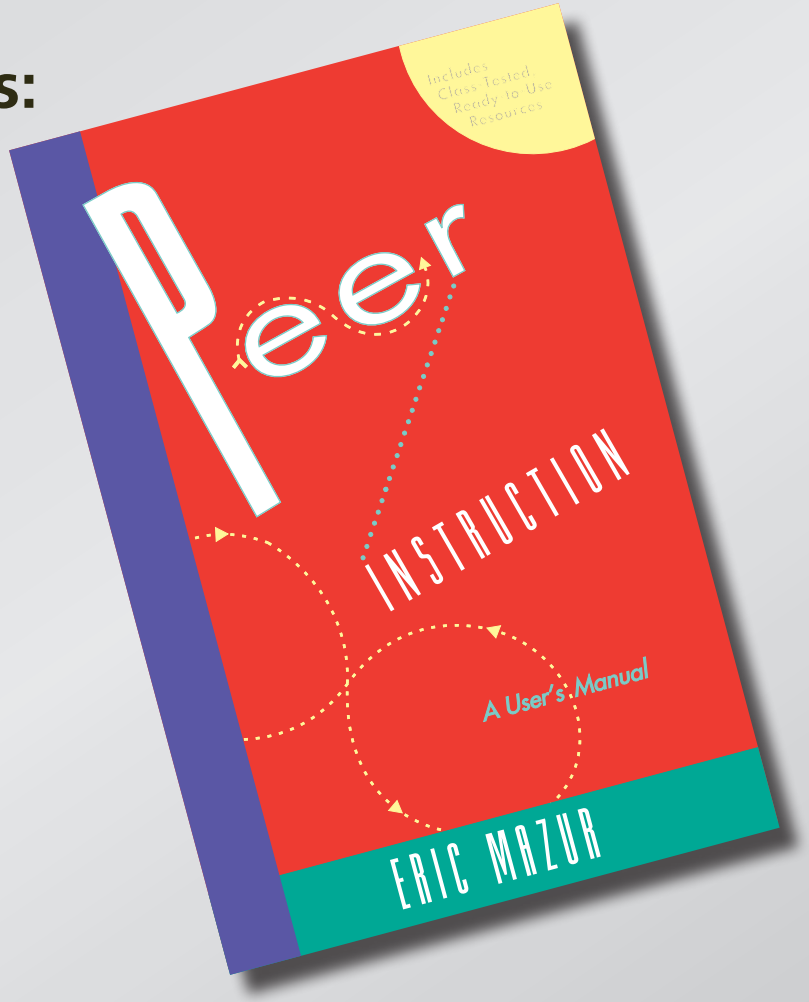
Frequently Asked Questions

"How do I write/find good questions for…?"

ConcepTests

Books with ConcepTests:

- **Physics (Prentice Hall)**



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- **Physics (Prentice Hall)**
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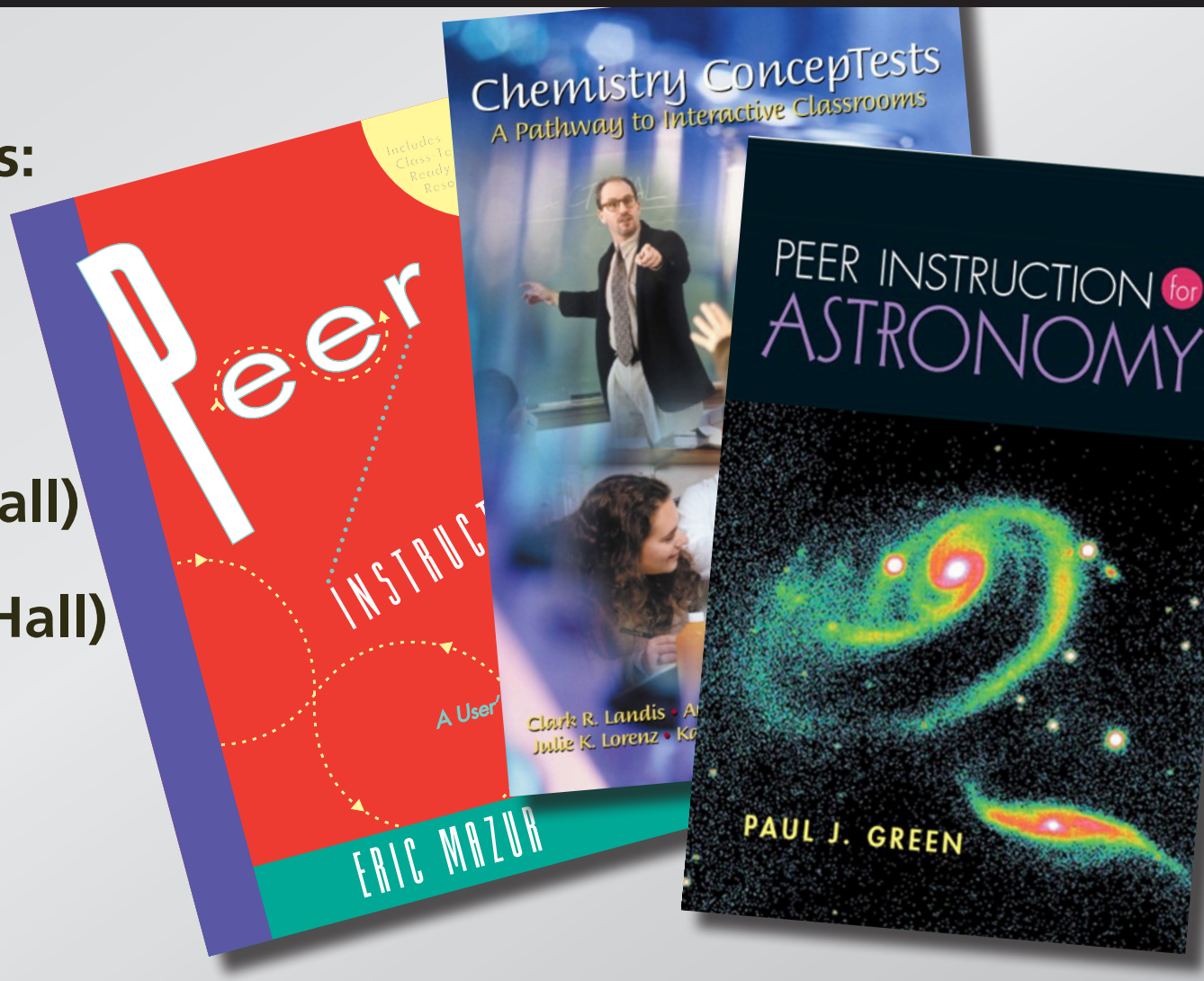
- **Physics (Prentice Hall)**
- **Chemistry (Prentice Hall)**
- **Astronomy (Prentice Hall)**



ConcepTests

Books with ConcepTests:

- **Physics (Prentice Hall)**
- **Chemistry (Prentice Hall)**
- **Astronomy (Prentice Hall)**
- **Calculus (Wiley)**

ConcepTests

… or try searching Google:

<subject> “Peer Instruction”

<subject> ConcepTest

<subject> “Concept Test”

<subject> clickers

ConcepTests

Types of questions

- survey
- model testing
- discussion
- select from list

Let's try it!

Which of the following airlines tries to save fuel by suggesting that its passengers use the bathroom before boarding?

1. Delta Airlines
2. Lufthansa
3. All Nippon Airways
4. British Midland Airways
5. Air France
6. JAL
7. Aboriginal Air Services
8. Aeroflot
9. Are you kidding me? None of the above.

Let's try it!

Which of the following airlines tries to save fuel by suggesting that its passengers use the bathroom before boarding?

1. Delta Airlines
2. Lufthansa
3. **All Nippon Airways** ✔
4. British Midland Airways
5. Air France
6. JAL
7. Aboriginal Air Services
8. Aeroflot
9. Are you kidding me? None of the above.

ConcepTests

hole in plate/circumference

model

airline

fact

ConcepTests

hole in plate/circumference

model

airline

fact

fact-recall not engaging

Evaluating questions

“What constitutes a good question?”

Evaluating questions

Good conceptual questions (ConcepTests):

- focus on interpretation/model (not recall)
- stimulate discussion
- are not “leading questions”
- are of manageable difficulty

Evaluating questions

Let’s evaluate some questions!

Getting started

“I still need help getting started…”

Join now!

PeerInstruction.net

Funding:

National Science Foundation

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