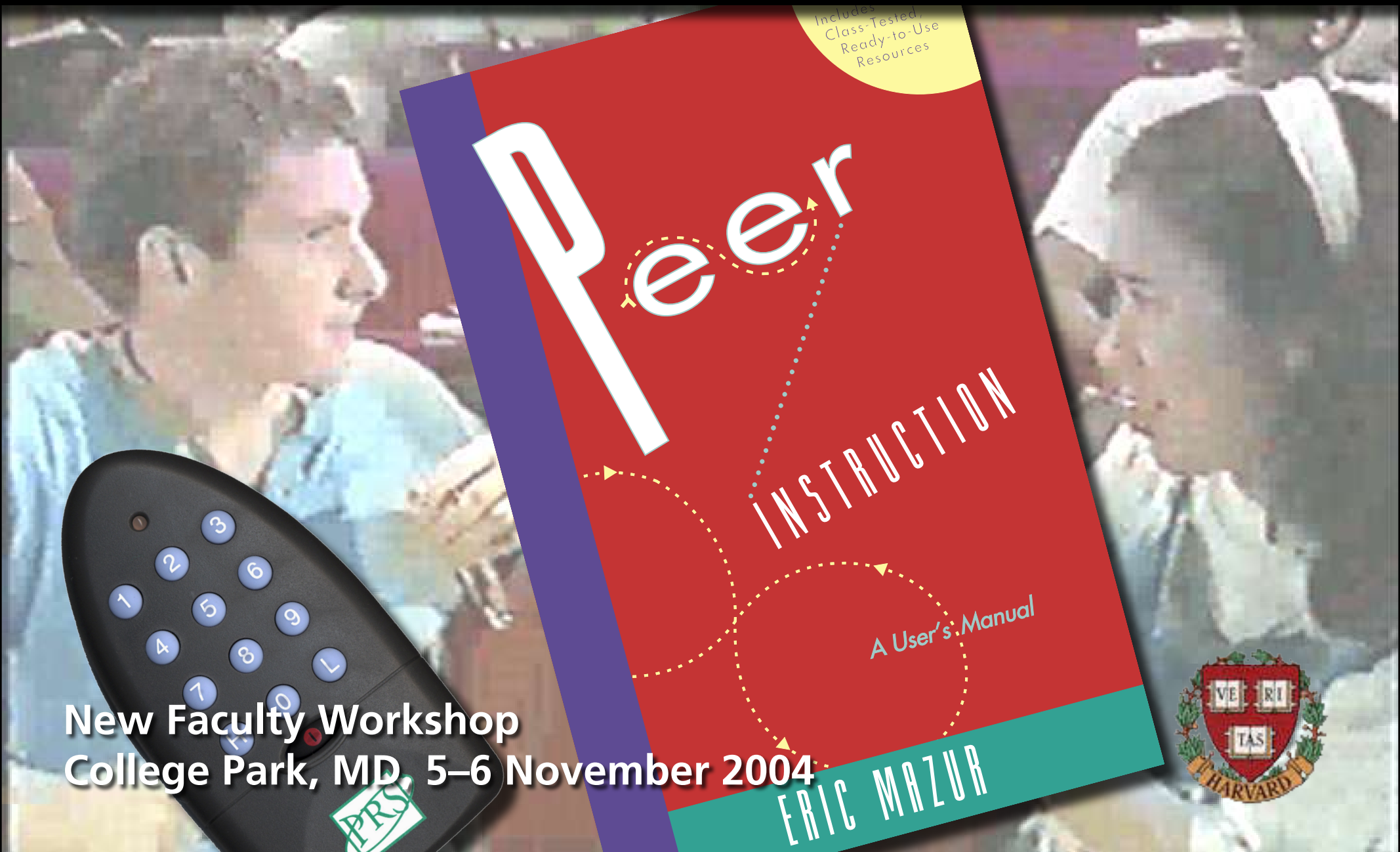
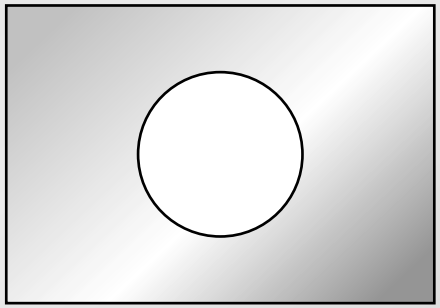
Peer Instruction: discussion and ‘brains-on’ demo



New Faculty Workshop
College Park, MD, 5–6 November 2004

Let's try it!

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



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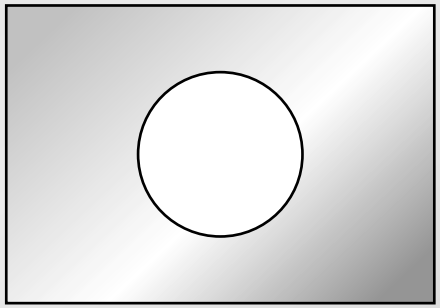


When the plate is uniformly heated, the diameter of the hole

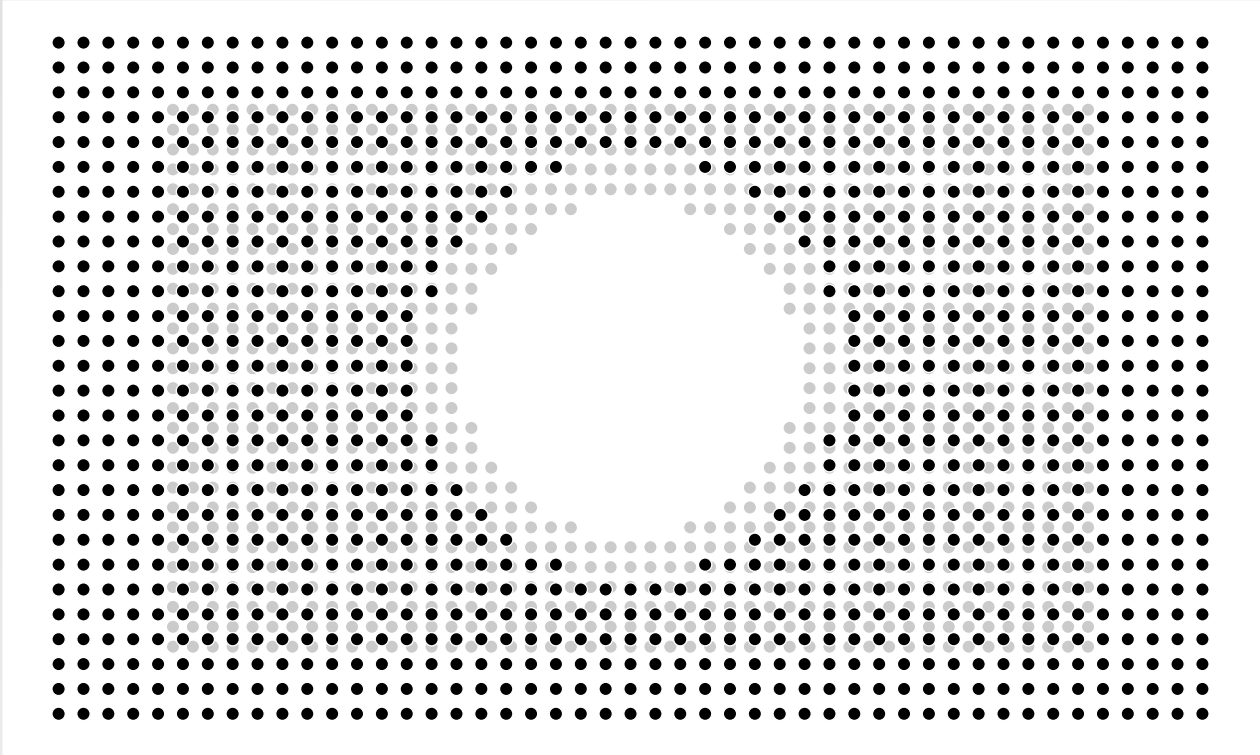
1. increases.
2. stays the same.
3. decreases.

Let’s try it!

It’s easy to fire up the audience!

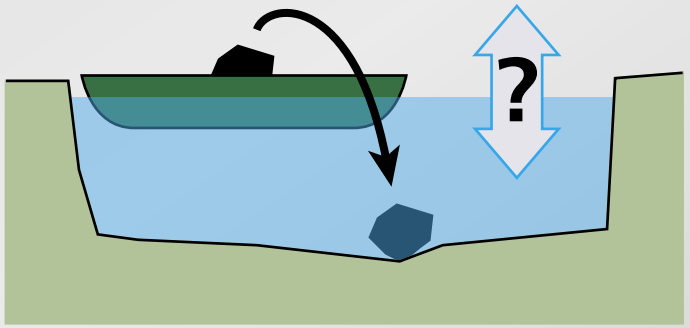
Let’s try it!

The distance between the atoms increases uniformly



Let's try it!

A boat carrying a large boulder is floating on a small pond. The boulder is thrown overboard and sinks to the bottom of the pond.



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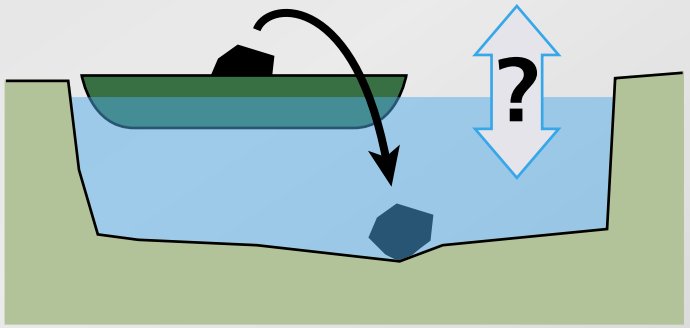


After the boulder sinks to the bottom of the pond, the level of the water in the pond is

1. higher than
2. the same as
3. lower than

it was when the boulder was in the boat.

Let's try it!

We all make mistakes!

Let's try it!

When we hold a page of printed text in front of a mirror, the text on the image in the mirror runs from right to left:

The New York Times

Let's try it!

When we hold a page of printed text in front of a mirror, the text on the image in the mirror runs from right to left:

Why is it that right and left are interchanged and not top and bottom? Because:

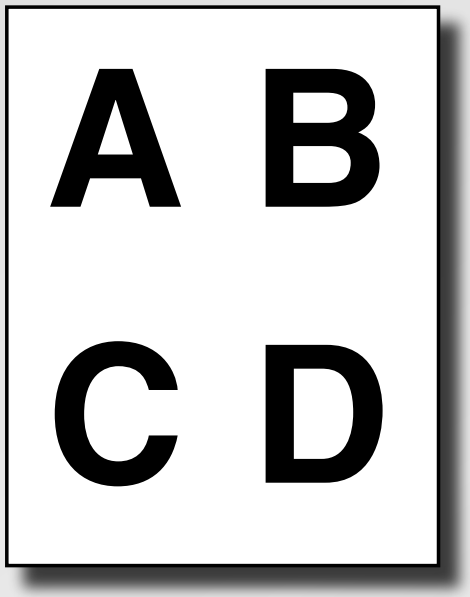
1. the mirror is oriented vertically.
2. we have two eyes in the horizontal plane.
3. the Earth's gravitation is directed downward.
4. a habit we have when looking at images in a mirror.
5. It only *appears* to run from left to right.

Let’s try it!

It’s “simple” only if you know the answer

Feedback methods

Flashcards: simple and effective



Feedback methods

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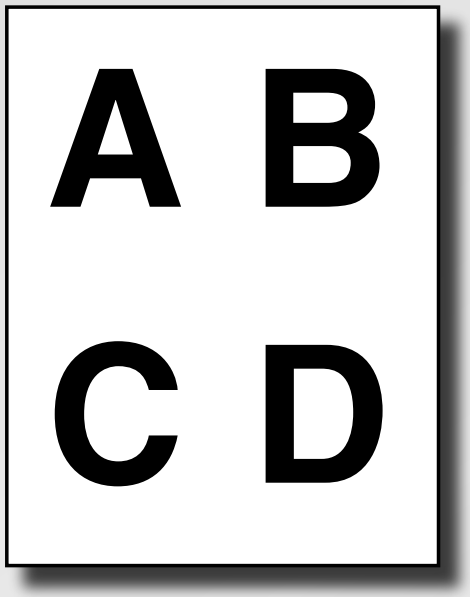

Meltzer and Mannivanan, South Eastern Louisiana University

Feedback methods

Infrared transmitters (PRS): easy collection of data

Feedback methods

Infrared transmitters (PRS): easy collection of data

Kristy Beauvais, Concord Carlisle High School

Feedback methods

near future: wireless classroom

Problems with problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

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Requires:

Assumptions
Developing a model
Applying that model

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Requires:

Applying a (new) model

Problems with problems

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Requires:

Using a calculator

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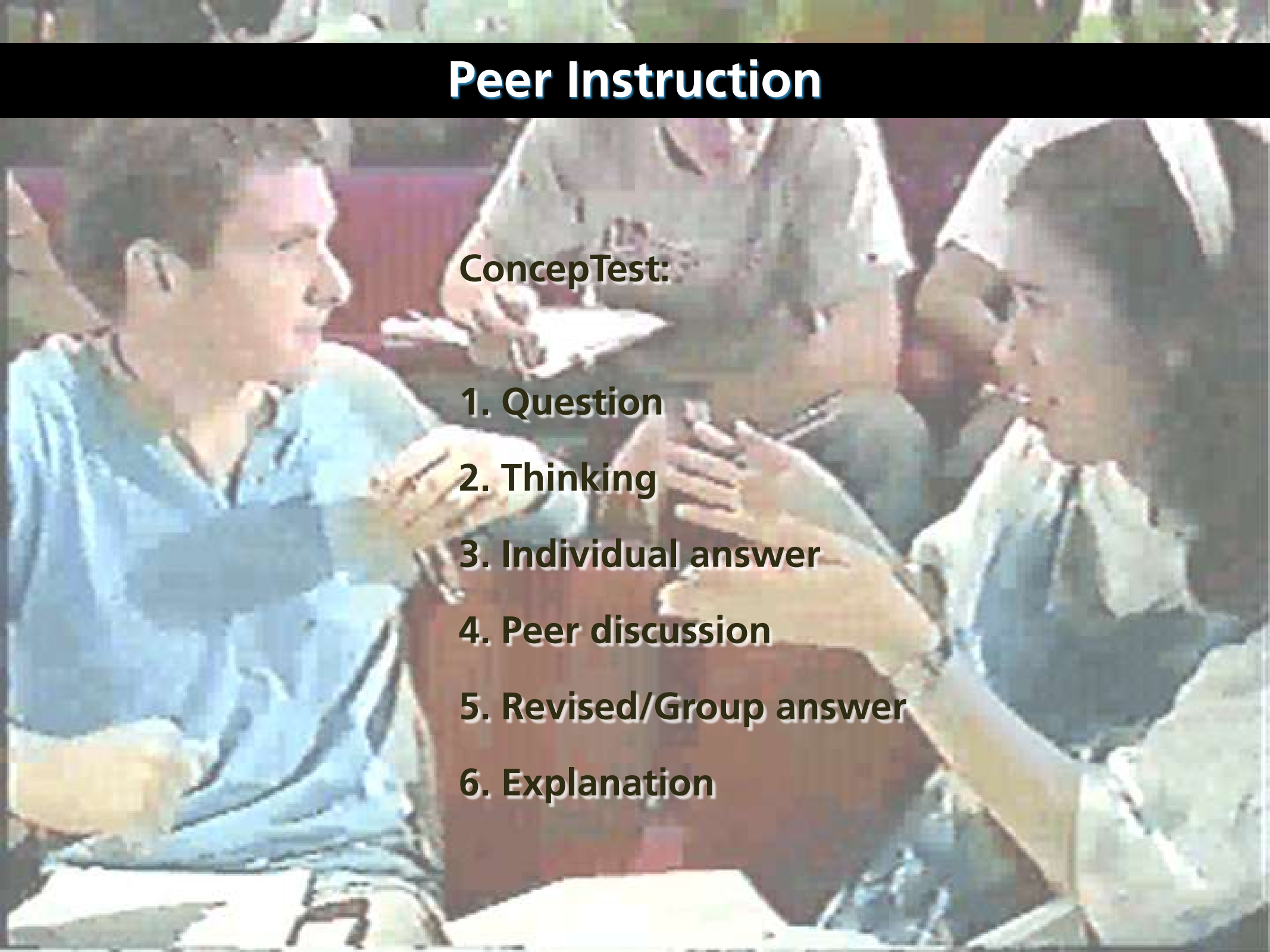
Peer Instruction

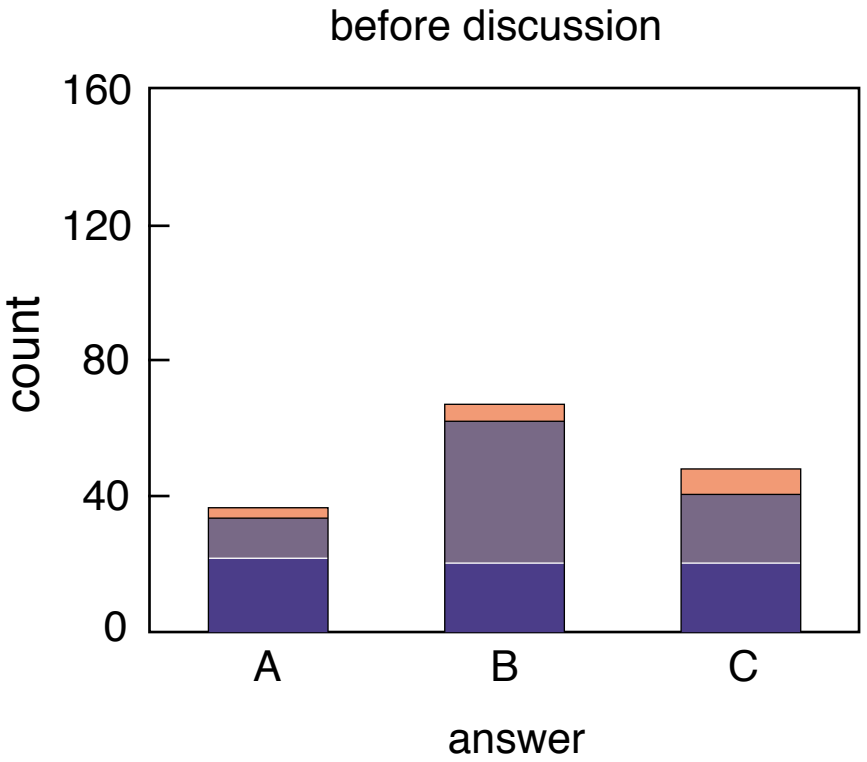


ConcepTest:

1. Question
2. Thinking
3. Individual answer
4. Peer discussion
5. Revised/Group answer
6. Explanation

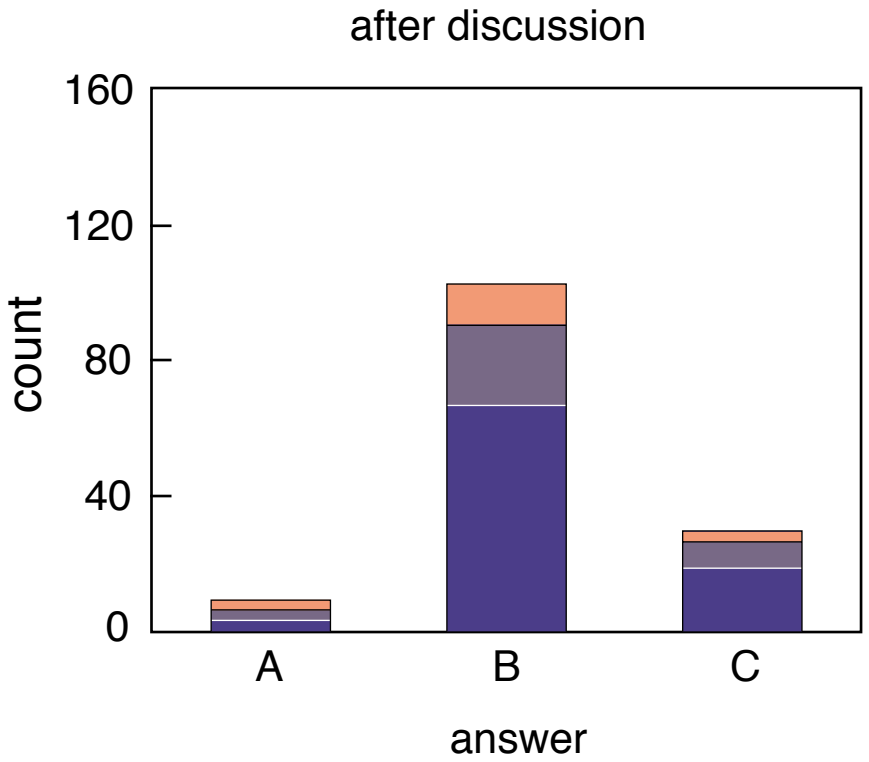
Peer Instruction

Individual answers



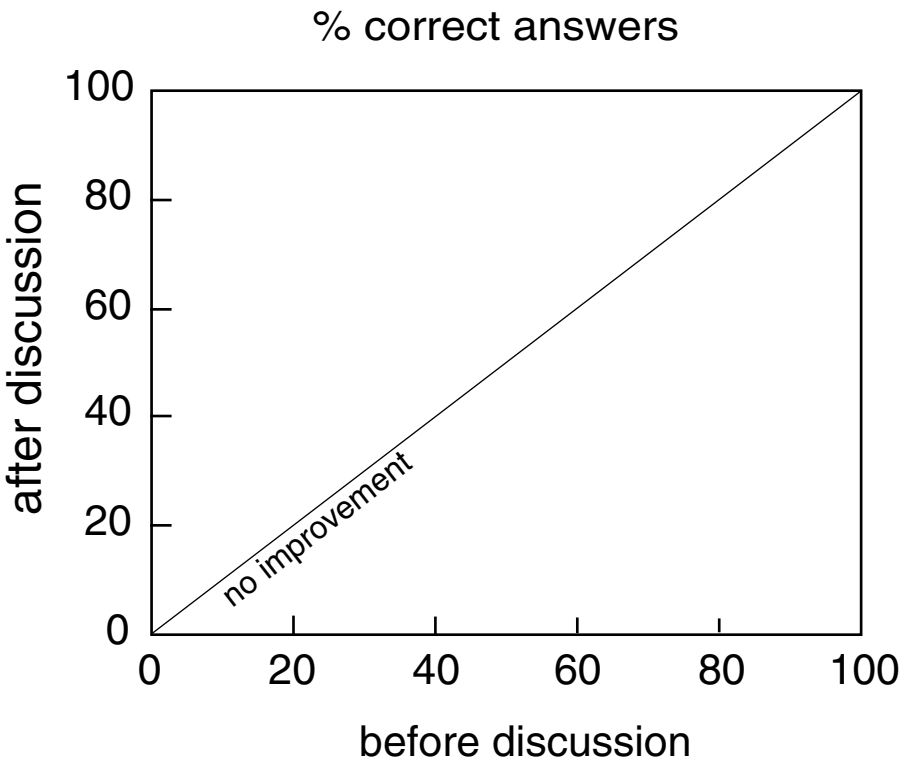
Peer Instruction

group answers



Peer Instruction

ConcepTest data



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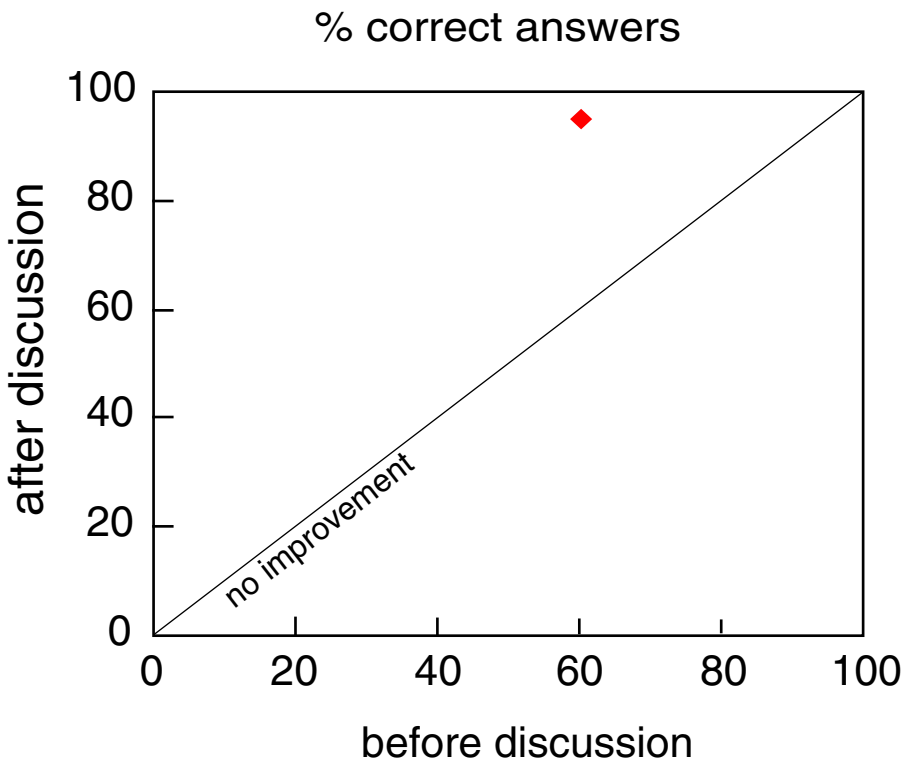

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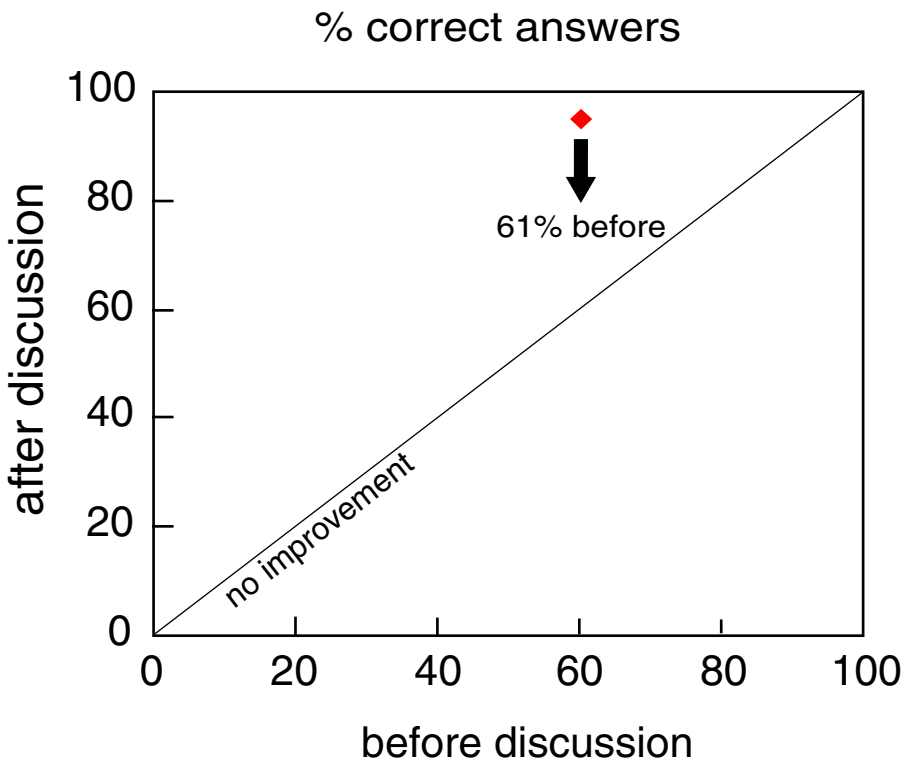

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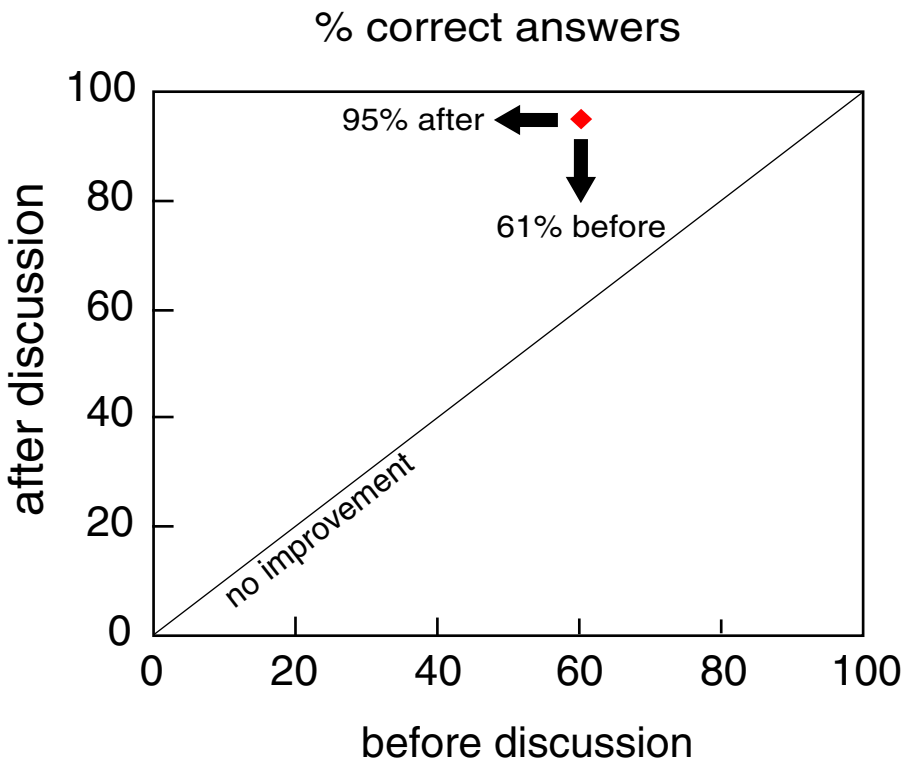

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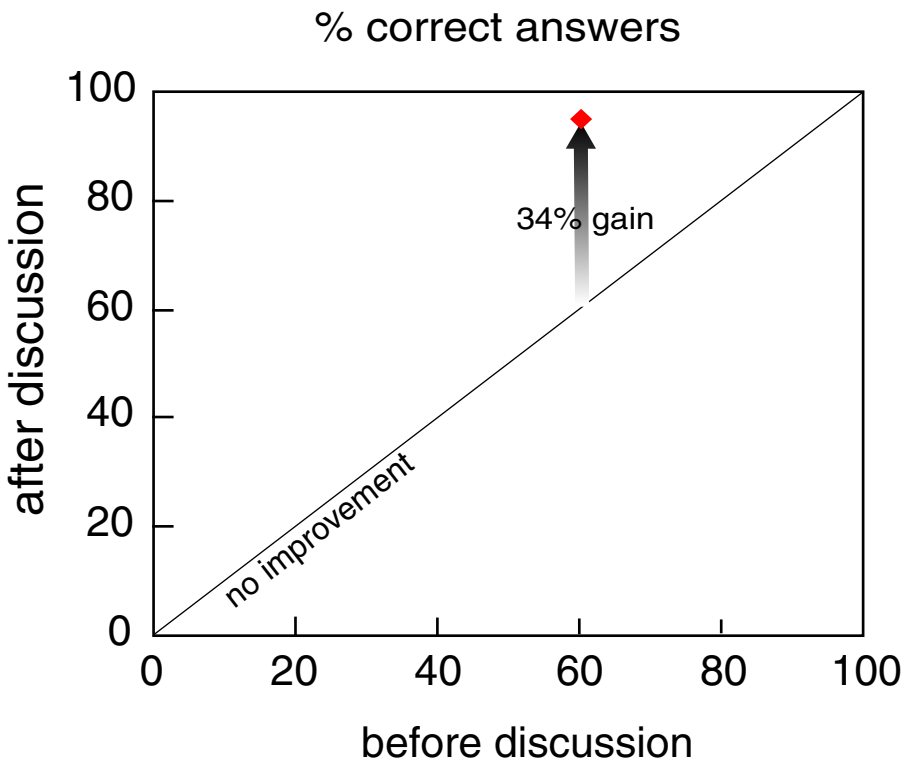

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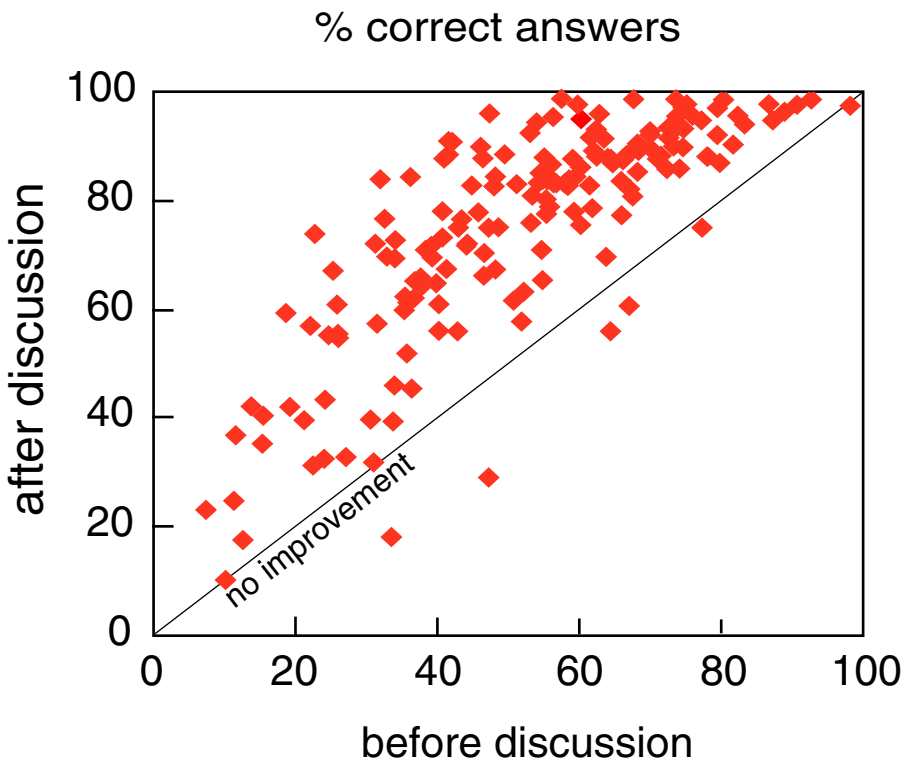

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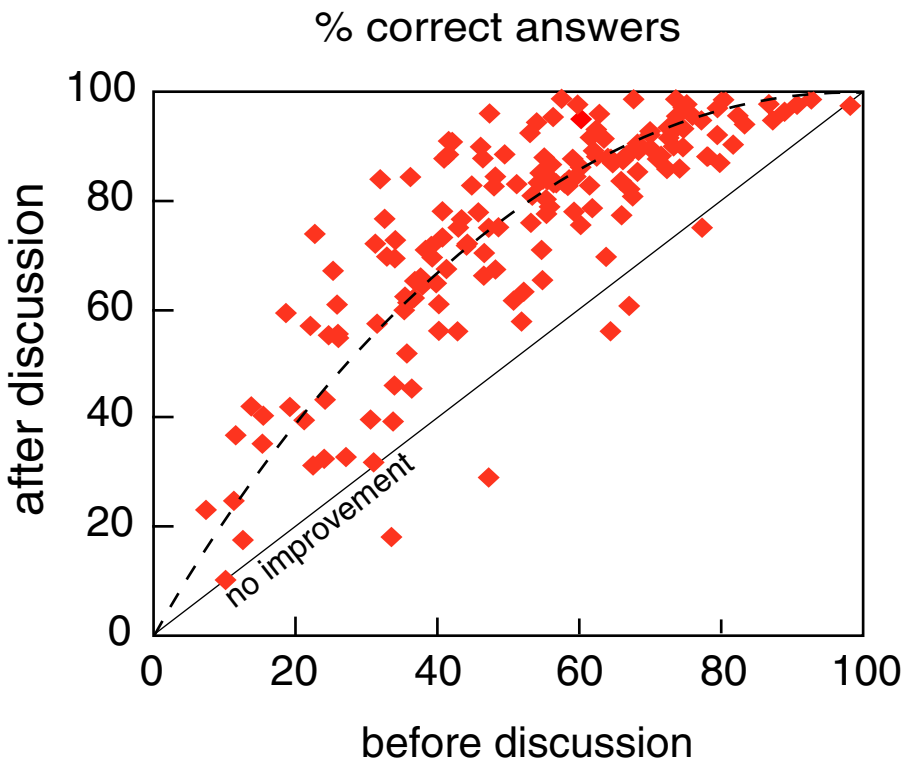
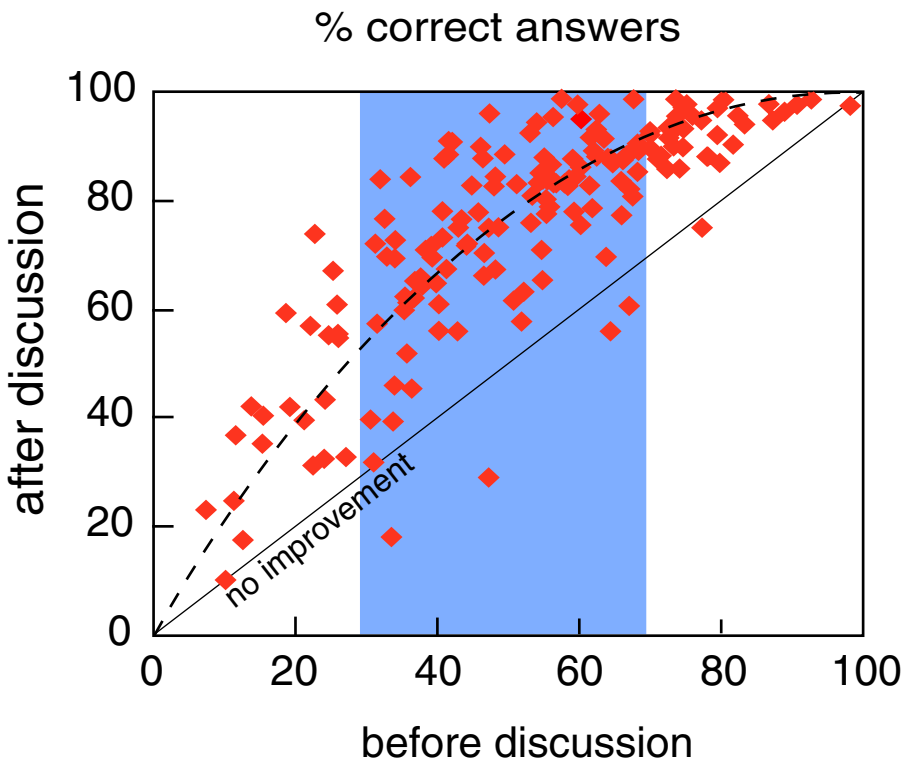


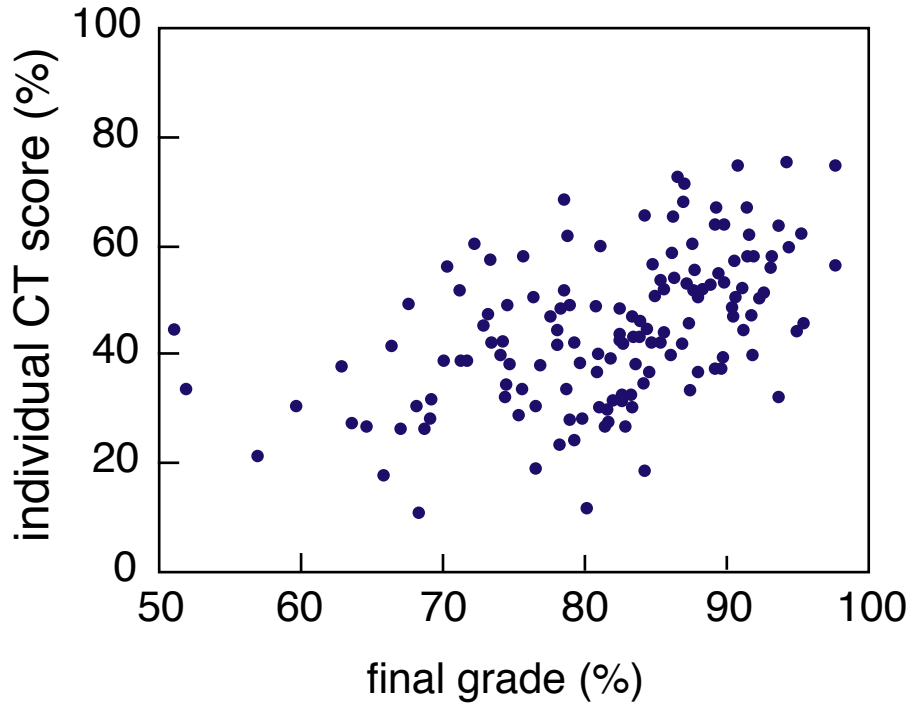
Peer Instruction

optimum range: 30–70%



Research: providing the basis for change

who benefits from the ConcepTests?



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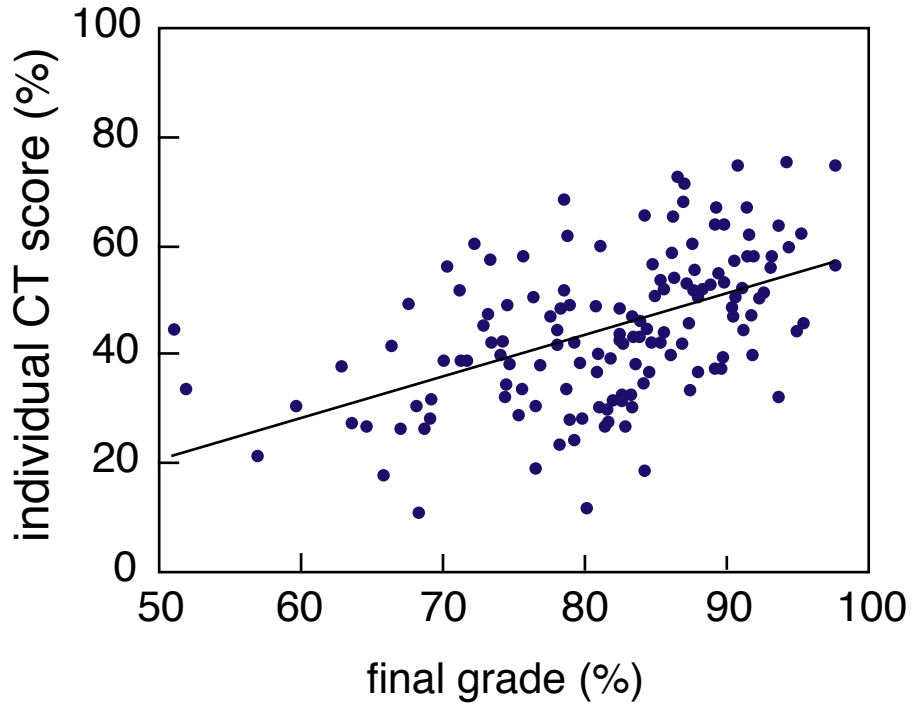

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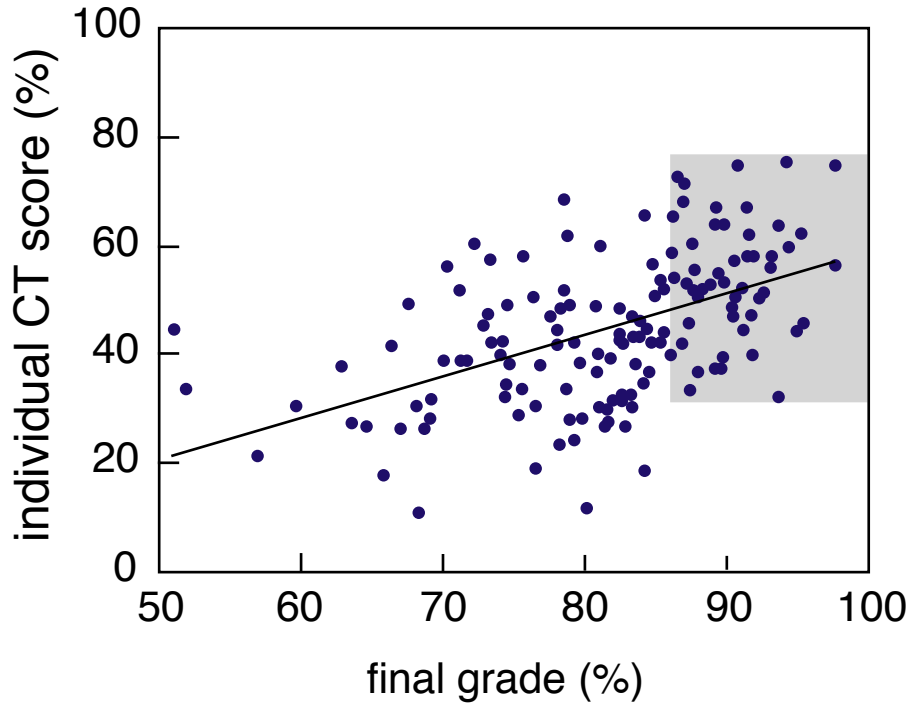
even the best students are challenged



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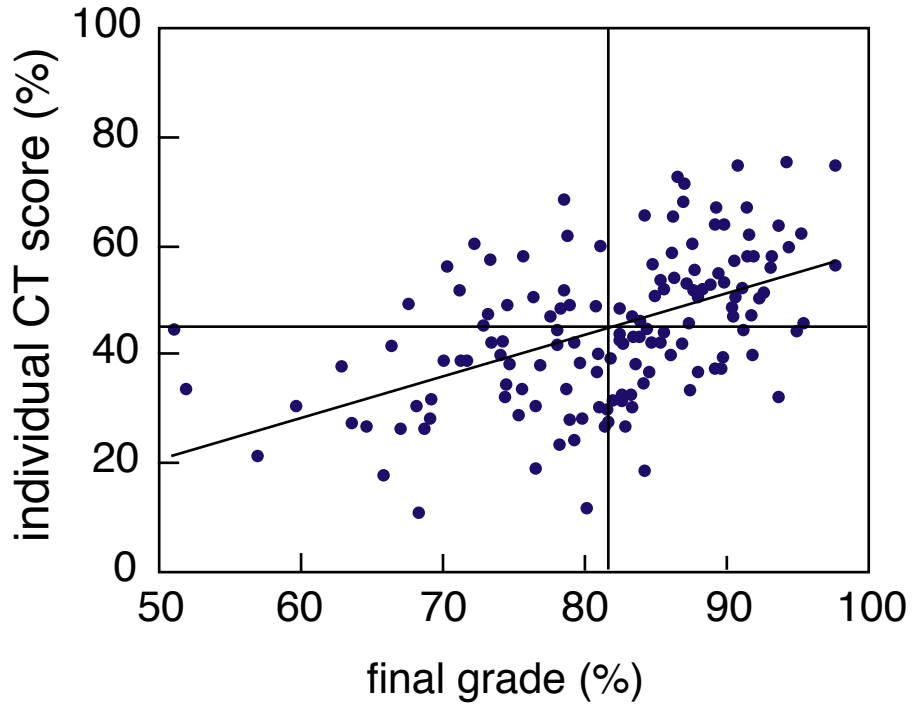

Why does it work?

Students:

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

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- promotes thinking
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- boosts confidence

Faculty:

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

Funding:

National Science Foundation

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