Peer Instruction — in person or online

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an illusion...
thermal expansion
all of them
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, 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
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole
consider atoms at rim of hole

you won't forget this
points worth noting

• my "clear" lecture wasn’t very good

• discussion promoted “aha” moments
information transfer

sense-making
in class

information transfer

sense-making
in class

information transfer

out of class

sense-making
Should focus on THIS!

**in class**
information transfer

**out of class**
sense-making
out of class

information transfer

in class

generate sense-making
out of class

- information transfer

in class

- sense-making

Peer Instruction
question
question

think
question

think

poll
question
↓
think
↓
poll
↓
discuss
question

think

poll

discuss

repoll
Higher learning gains
Higher learning gains

<table>
<thead>
<tr>
<th>normalized gain (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

lecturing
Higher learning gains

normalized gain (%)

lecturing  PI

INSTRUCTION
Peer instruction:
Higher learning gains
Better retention
how to effectively transfer information outside classroom?
Solution

turn out-of-class component also into a social interaction!
social learning platform
class test results

![Bar chart showing percent of students vs. number of chapters missed before class.](chart.png)
class test results

close to 95%!
can think of this in terms of the Torque equation. The equation for torque is $\tau = r \times F$, with $r$ being the lever arm distance and $F$ being force. We know that force is a vector vector from previous chapters, and in regards to $\tau$ it can also be thought of as the radial vector. What this means is that this distance from the pivot points from the axis of rotation to the point where the force acts. In as previously mentioned, there is a general convention (the right-hand rule) that is used to determine the direction which happens to be perpendicular to both the radius from the axis and to the force.

Enter your comment or question and press Enter.
Perusall Peer Instruction works online!
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 engagement/social interaction a must!
for a copy of these slides

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