Turning lectures into learning

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Introduction



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lectures focus on delivery of information

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but education is more than information transfer

Outline

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Outline

Peer Instruction

• Let's try it!

• Results



move information transfer out of classroom

assign readingteach by questioning

brief lecture























Outline

Peer Instruction

Let's try it!

Resul

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.



















Imagine a rope that fits snugly along the equator.



Imagine a rope that fits snugly along the equator.

Suppose the rope is cut and 1 m of rope is inserted between the cut ends. If the rope were to maintain a circular shape, how far off the surface of the Earth would it float?

- 1. the width of a few atoms
- 2. the width of a few hairs
- 3. the height of a curb
- 4. exactly 1 m
- 5. more than 1 m



circumference at equator:

 $2\pi R_{\rm E}$

circumference at equator:

 $2\pi R_{\rm E}$

new circumference:

 $2\pi R_{\rm E} + 1 \,{\rm m}$

circumference at equator:

 $2\pi R_{\rm E}$

new circumference:

 $2\pi R_{\rm E} + 1 \,{\rm m}$

radius of circle with new circumference:

 $2\pi R = 2\pi R_{\rm E} + 1 \,{\rm m}, \text{ and so } R = R_{\rm E} + \frac{1 \,{\rm m}}{2\pi}.$



It's easy to fire up the audience!

Outline



traditional instruction



traditional instruction



traditional instruction



first year of implementing PI



first year of implementing PI



first year of implementing PI





what about problem solving?





better understanding leads to better problem solving



Conclusion

active engagement greatly improves learning gains

Conclusion

active engagement greatly improves learning gains

technology facilitates active engagement

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