

# Responsive Teaching: Hinge questions

**The Education People, 14<sup>th</sup> October, 2020**

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- > Examine what a hinge question does
- > Design effective hinge questions
- > Plan how to use hinge questions in the classroom

Why hinge questions?

Designing hinge questions

Responsive teaching

A square wooden picture frame with a multi-layered, beveled design. Inside the frame, the words "The mystery" are written in a simple, black, sans-serif font, centered horizontally and vertically.

The mystery







A square wooden picture frame with a multi-layered, ornate design. The frame is made of a light-colored wood with a natural grain. Inside the frame, the words "The danger" are written in a simple, black, sans-serif font, centered horizontally and vertically.

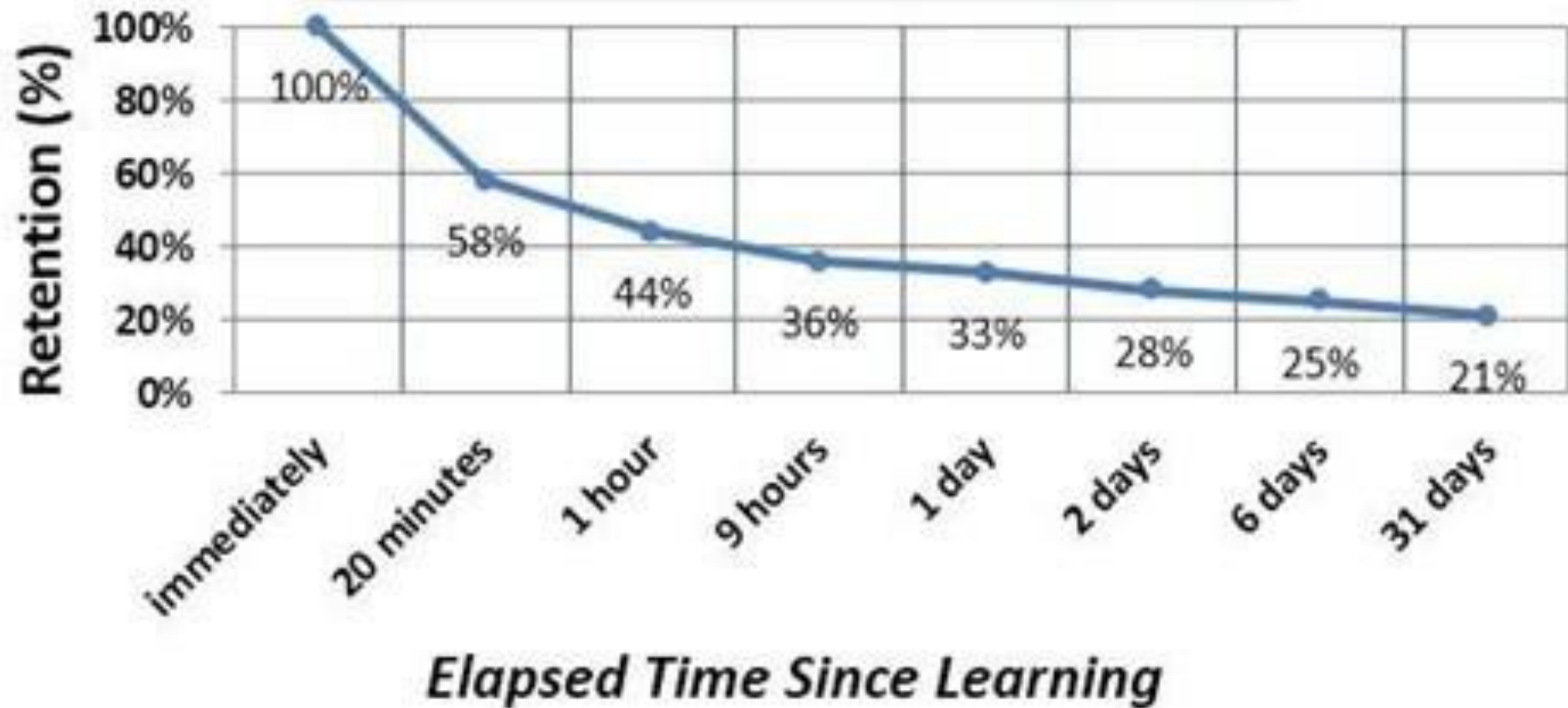
The danger



You've just given a brilliant explanation of a key idea in your subject.

What two things are bound to happen?

## Ebbinghaus Forgetting Curve





No matter how well you describe something, how well you illustrate and explain it, students invent some new way to misunderstand what you have said.



Nuthall, 2007



$$A) 3 \times 3 = ?$$

$$B) 3 \times 3 = 5$$

A)  $3 \times 3 = ?$   $\longrightarrow$  Teach

B)  $3 \times 3 = 5$   $\longrightarrow$  “Check”

C)  $3 \times 3 = 6$   $\longrightarrow$  ?



A square wooden picture frame with a multi-layered, beveled design. Inside the frame, the text "The opportunity" is centered in a simple, black, sans-serif font.

The opportunity



Derek Muller shows us the opportunity misconceptions present...

For an upcoming lesson, what misconceptions do you anticipate?

## Drawing this together...

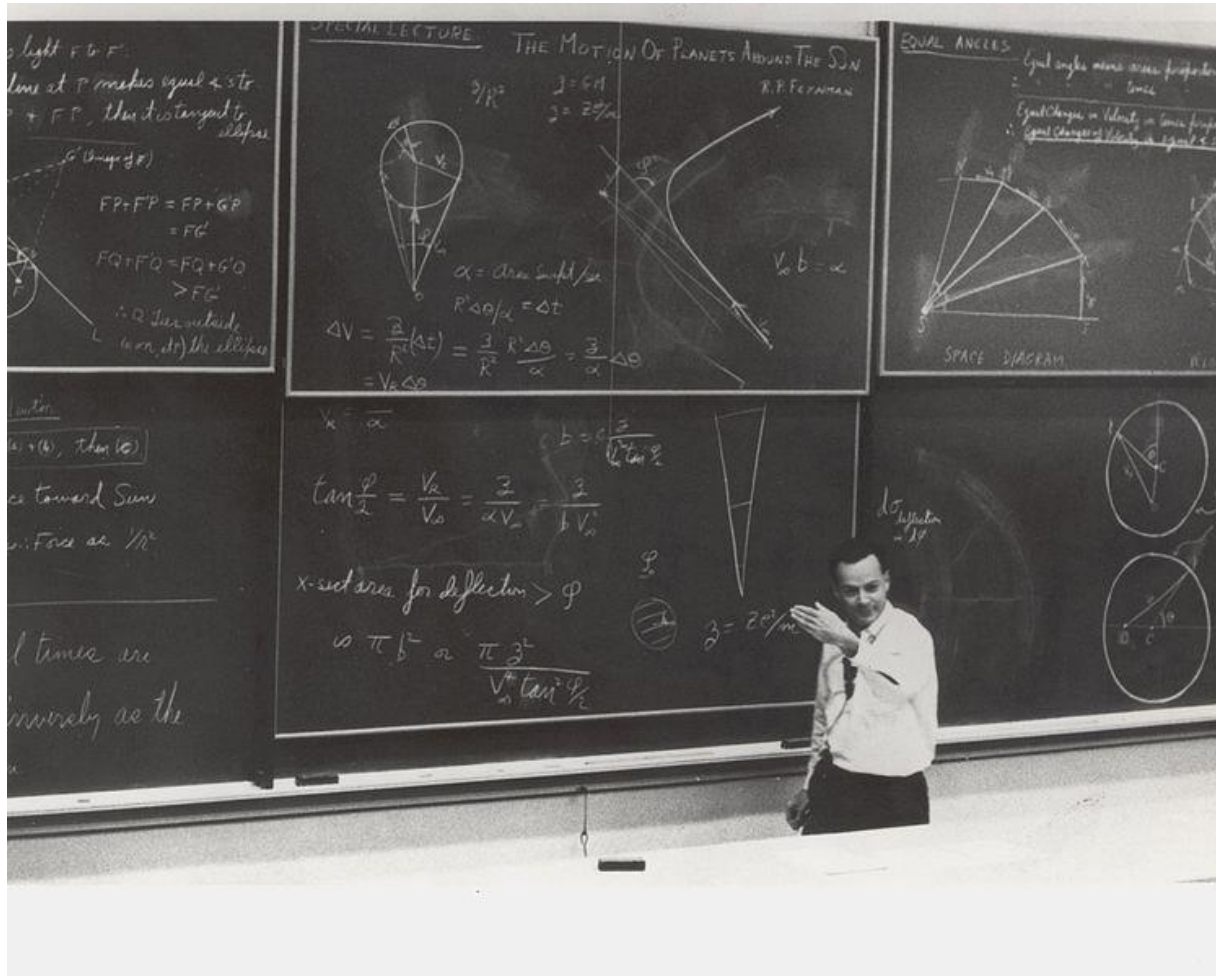
- > It's hard to know what students are thinking
- > Misconceptions undermine understanding (and future learning)
- > Misconceptions are an opportunity
  
- > We need an efficient way to know what students are thinking – and what misconceptions they hold

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Among patients who died in intensive care, doctors who were “completely certain” of their diagnosis...

Among patients who died in intensive care, doctors who were “completely certain” of their diagnosis...

...were wrong **40%** of the time.

We need a tool which:

- > Rapidly reveals student understanding
- > Captures what every student is thinking
- > Doesn't rely on self-report

Which of these campaigns was Martin Luther King involved in?

- a) The March on Washington
- b) The American Civil War
- c) Barack Obama's presidential campaign

Which of these campaigns was Martin Luther King involved in?

- a) The March on Washington
- b) The Freedom Riders Campaign
- c) Lunch counter sit-ins.

I am putting on my green skirt.

1  Je vends ma jupe verte.

2  Je suis en train d'enfiler ma chemise verte.

3  Je mets ma jupe verte.

# Select the missing word

Le \_\_\_\_\_

1

femme

4

fille

2

garçon

5

garçon

3

garson

# The hinge question...

- > Closed question
- > Quick to answer
- > Built around (crucial) misconceptions



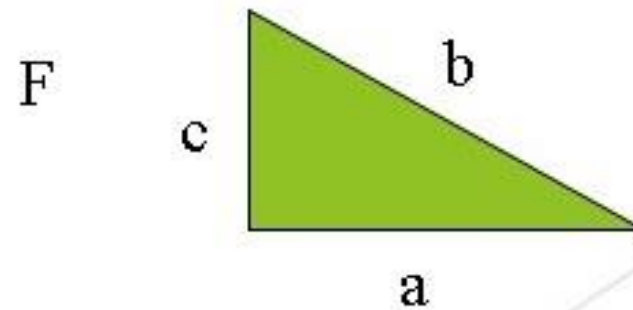
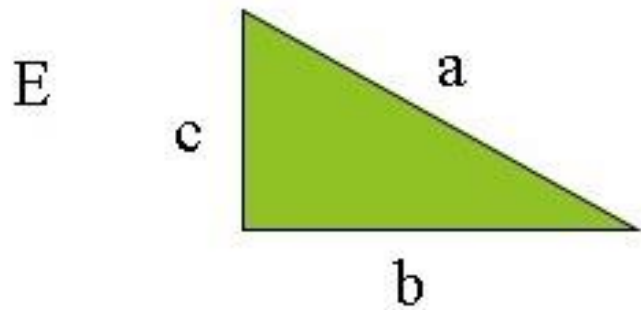
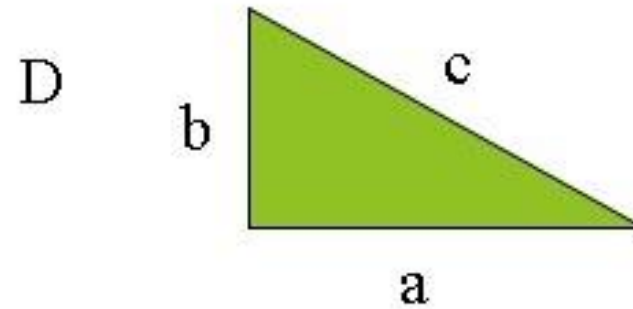
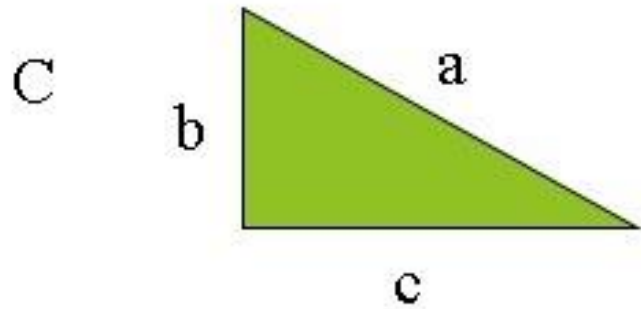
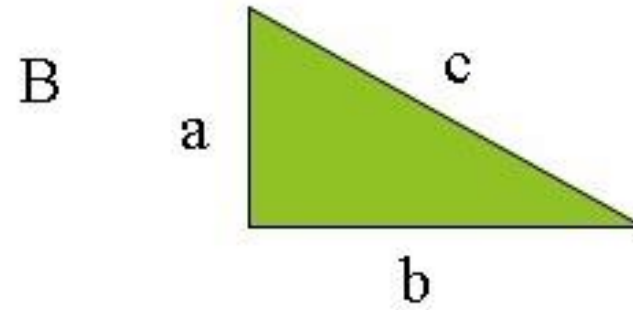
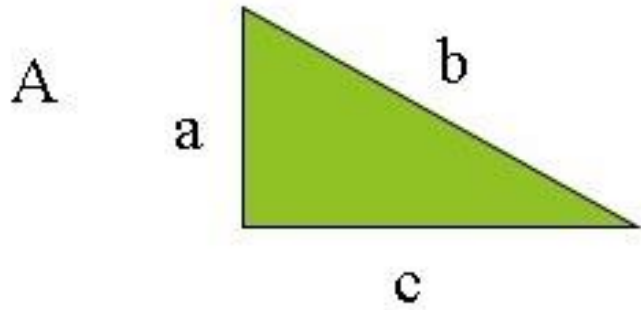
Which of these is correct?

- A. Its on its way.
- B. It's on its way.
- C. Its on it's way.
- D. It's on it's way.

$$(4 + 2 \times 3) + (7 - 2 + 1) =$$

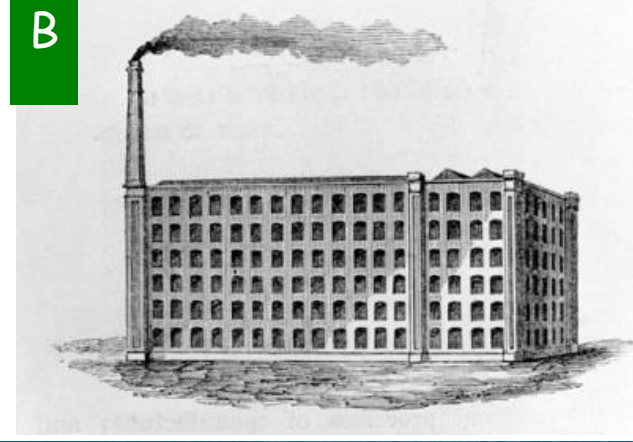
- A. 16
- B. 24
- C. 14
- D. 22

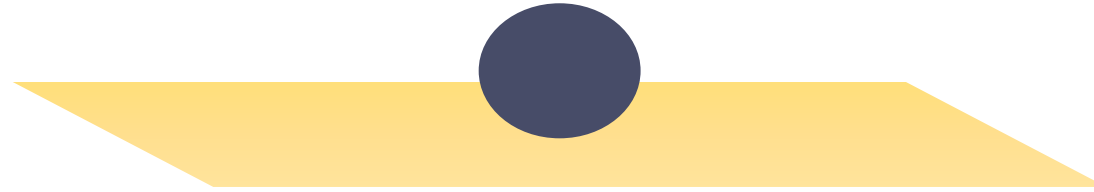
► In which of these right-angled triangles is  $a^2 + b^2 = c^2$ ?



# How did life change in the Industrial Revolution?

Which of these shows a building from the Industrial revolution?





The ball sitting on the table is not moving. It is not moving because:

- A. no forces are pushing or pulling on the ball
- B. gravity is pulling down, but the table is in the way
- C. the table pushes up with the same force that gravity pulls down
- D. gravity is holding it onto the table
- E. there is a force inside the ball keeping it from rolling off the table

At the end of Act I, Scene 2, which of these is true?

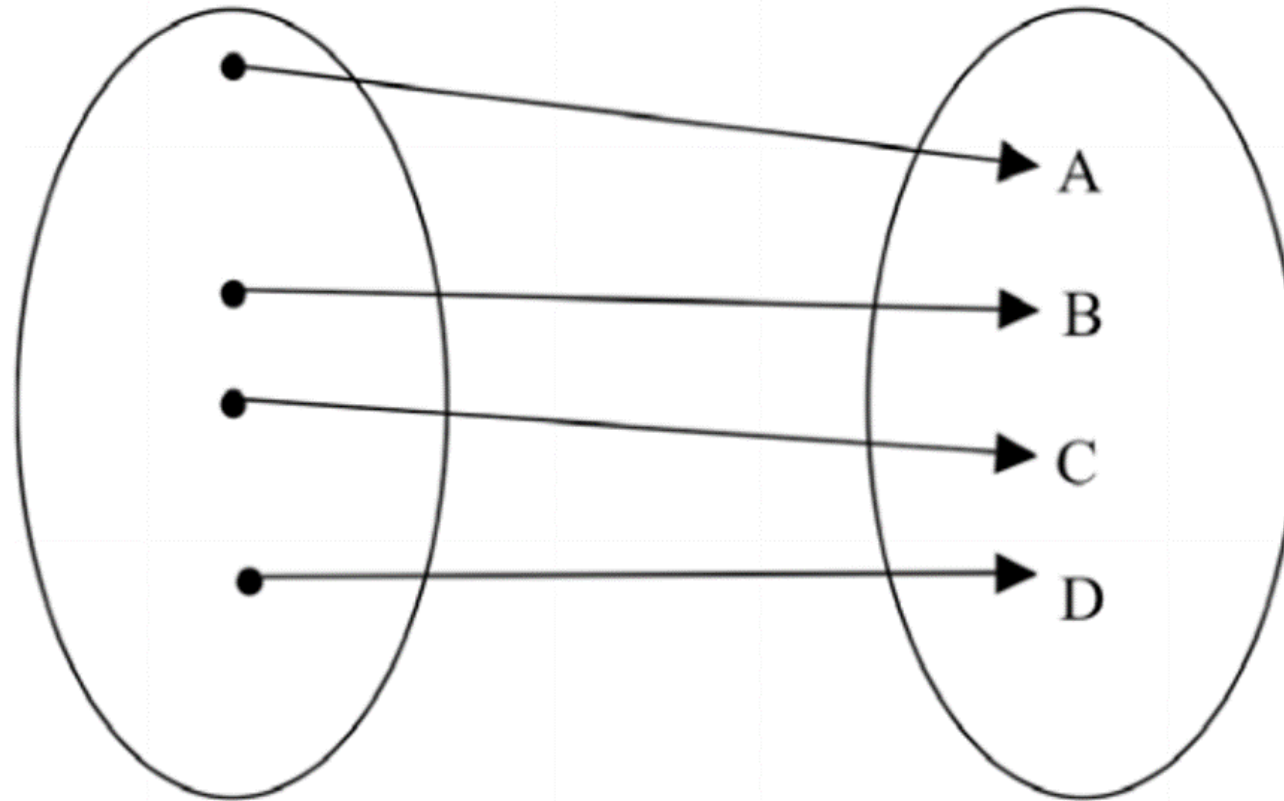
- a) The Montagues and the Capulets are enemies.
- b) Romeo is in love with Juliet.
- c) The Capulets have invited Romeo to their party.

Which of these sentences best begins an answer to the question, “How does Shakespeare present Lady Macbeth’s relationship with Macbeth in this scene?”

- A. Lady Macbeth sees Macbeth as cowardly and tells him what to do.
- B. Shakespeare shows that Lady Macbeth is in charge, for example, she tells Macbeth to “Give me the daggers.”
- C. Lady Macbeth is shown as dominating Macbeth and acting decisively for them both.

Cognitive Rules

Responses





# It is critical that a hinge question...

- a) Is a multiple choice question
- b) Provides interesting choices to discuss
- c) Unambiguously reveals what students think





Turn one (or more) misconceptions into a hinge question.



# In using these...



Hinge questions are problematic if...

- > We don't know what all students think
- > Students affect one another's answers (copying, calling out)

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// No matter how well you describe something, how well you illustrate and explain it, students invent some new way to misunderstand what you have said...  
And many have argued that the real business of teaching is the business of changing the well-established but inaccurate beliefs that students have. //

Nuthall, 2007



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How does Muller respond to misconceptions?



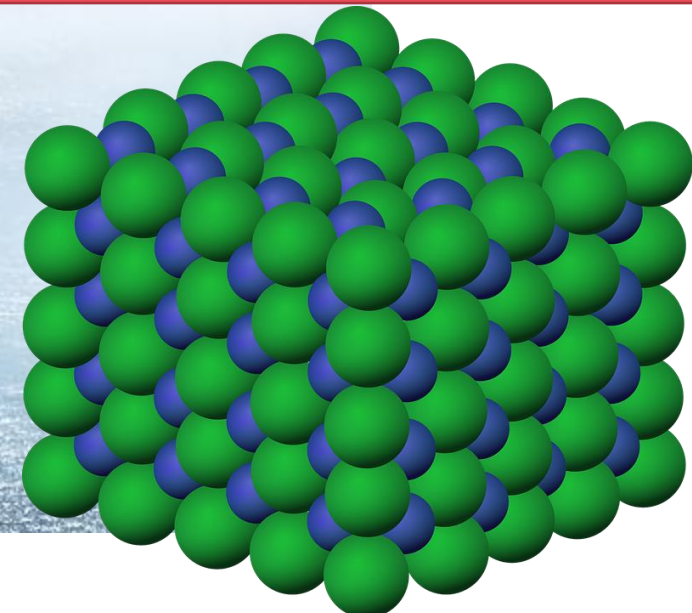
Known

Unknown



Unknown

Known





Unknown



Known

For each misconception, create a bridging analogy:



*So...*

*This is similar to...*

*We know...*

- > Misconceptions are powerful and ubiquitous
- > Hinge questions identify them
- > Formulate hinge questions around misconceptions
- > Bridge from known to unknown to correct them

# Thank you

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