

Critical-thinking Assessment Test: An Overview of the CAT

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CAT Workshop

Prepare institutions to conduct scoring workshops using the CAT instrument and understand what the CAT measures.

Help faculty use the CAT as a model to develop applications and assessments that emphasize critical thinking in their disciplines.



Individualized webinars after training to help institutions develop efficient assessment plans.

Importance of Critical Thinking

National polls indicate over 90% of the faculty in this country think critical thinking is the most important part of undergraduate education.

Derek Bok, 2005

President Emeritus of Harvard University

Viral Nature of Misinformation

Search
≠
Research



Confirmation
Bias

Information and the Internet


95% of College Students use Google to Search for Information in Course-Related Research

People are more likely to believe something on YouTube than from the CDC

71% of Adults Use the Internet for Healthcare Information



The Changing Nature of Education



**Remembering
Information**

Finding Relevant Information

**Understanding & Evaluating
Information**

Using Information Effectively

What is Critical Thinking?

Classic Emphasis

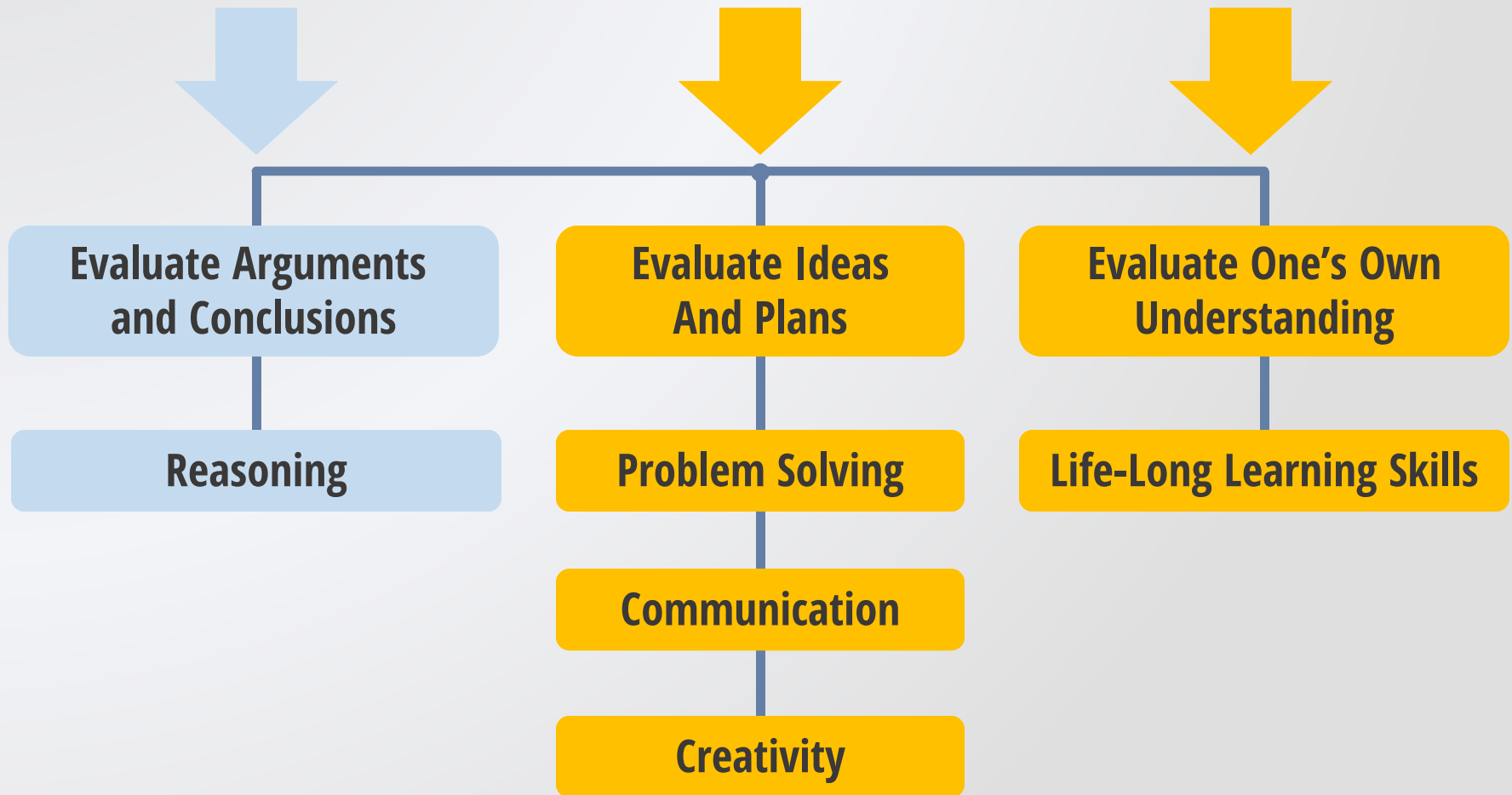
Evaluate Arguments and Conclusions

Reasoning

What is Critical Thinking?

Classical Emphasis

Expanded Contemporary Emphasis



Agreement on what is NOT Critical Thinking

*NSSE Question

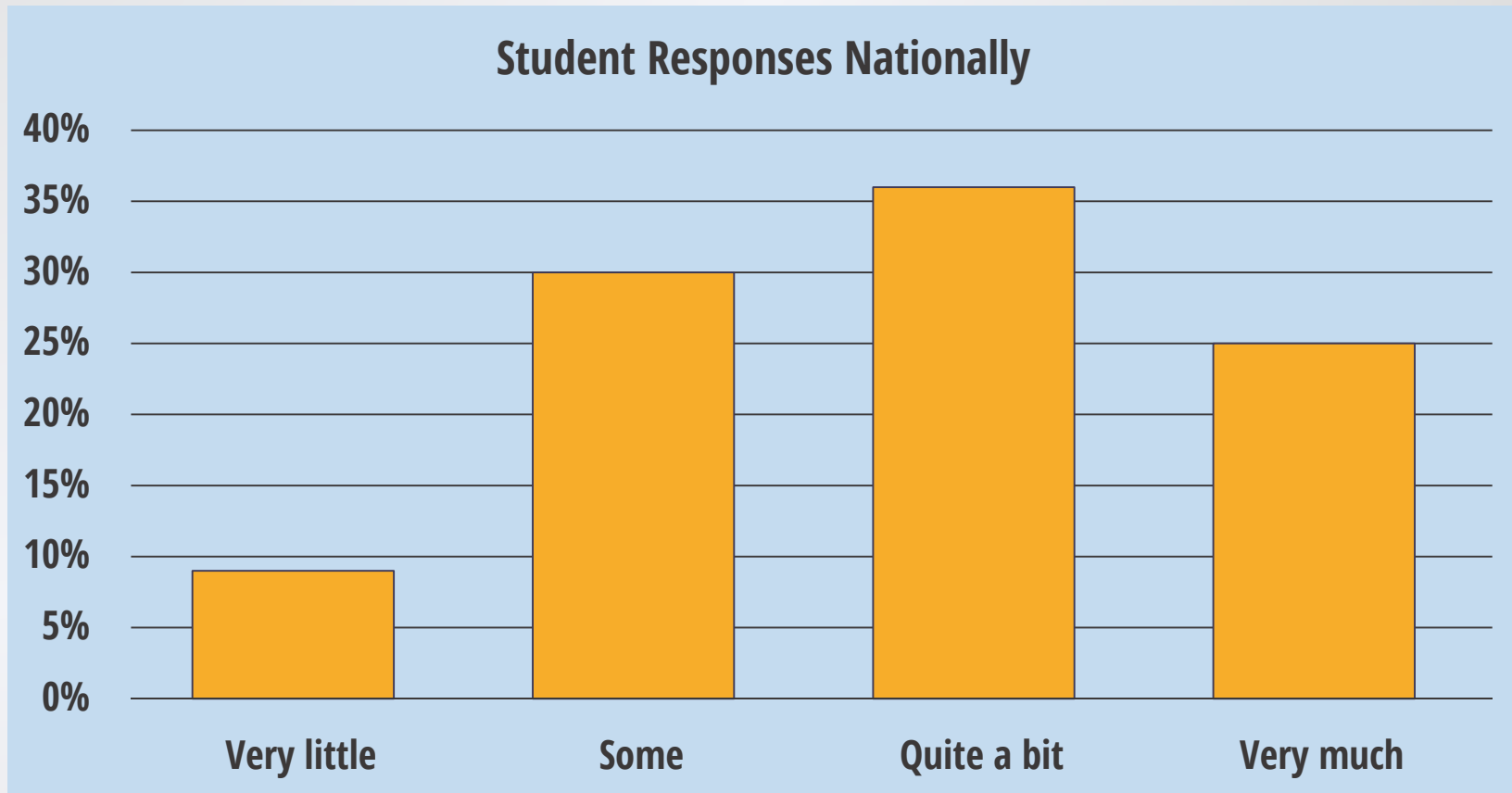
(2a) Memorizing facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form.

*National Survey of Student Engagement, Indiana University



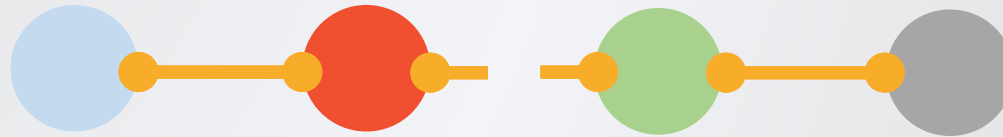
NSSE*: Coursework emphasizes:

(2a) Memorizing facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form.

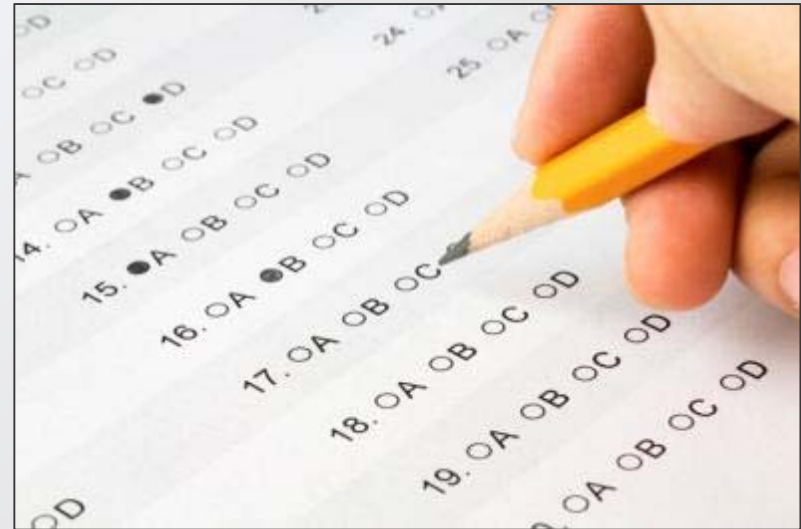


*National Survey of Student Engagement, Indiana University

Understanding the Disconnect



Teaching Critical Thinking



Assessing Factual Knowledge

Why Assess Critical Thinking?

Need to Measure Success for Accountability

Assessment Drives Improvement Efforts

How We Assess - Determines What Students Learn

History of CAT Development

**Preliminary Work
At TTU
2000 - 2004**



**Collaborate With Other
Institutions To Refine CAT
2004 - 2007**

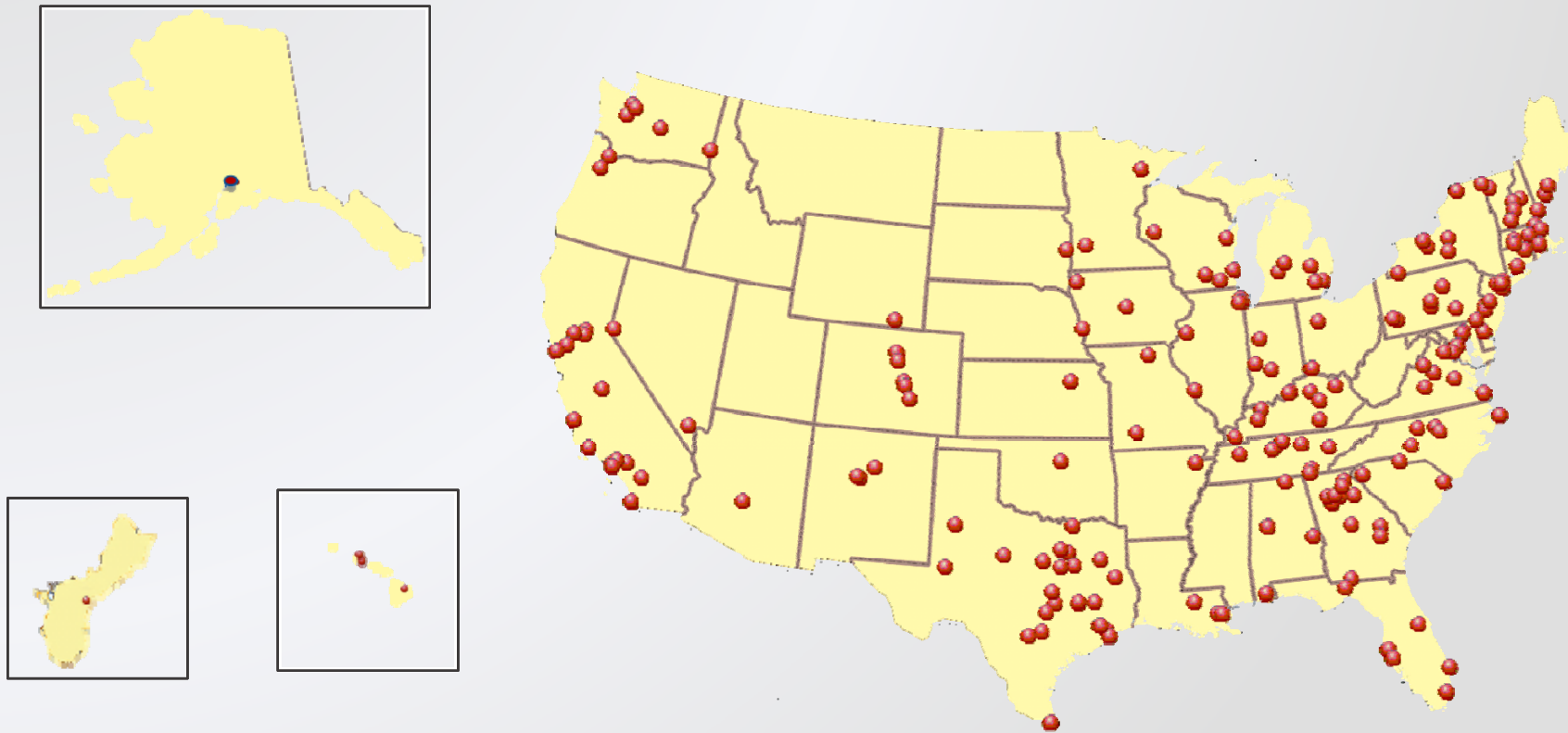


**Develop Training Methods for
National Dissemination & Collect Norms
2007 - 2010**



**Expand National Dissemination
& Support Assessment in NSF Projects
2010 - 2014**

Over 300 US Institutions Collaborating



+ Australia, Canada, China, Japan, and Palestine

Designing the CAT Instrument

**Construct Validity:
Learning Sciences**

**Faculty Driven:
High Face Validity
Involved in Scoring**

**Engaging for
Students**

**Reliable &
Consistent Scoring
Essay Responses**

Skills Evaluated by CAT Instrument

Evaluating Information

- Separate factual information from inferences.
- Interpret numerical relationships in graphs.
- Understand the limitations of correlational data.
- Evaluate evidence and identify inappropriate conclusions.

Creative Thinking

- Identify alternative interpretations for data or observations.
- Identify new information that might support or contradict a hypothesis.
- Explain how new information can change a problem.

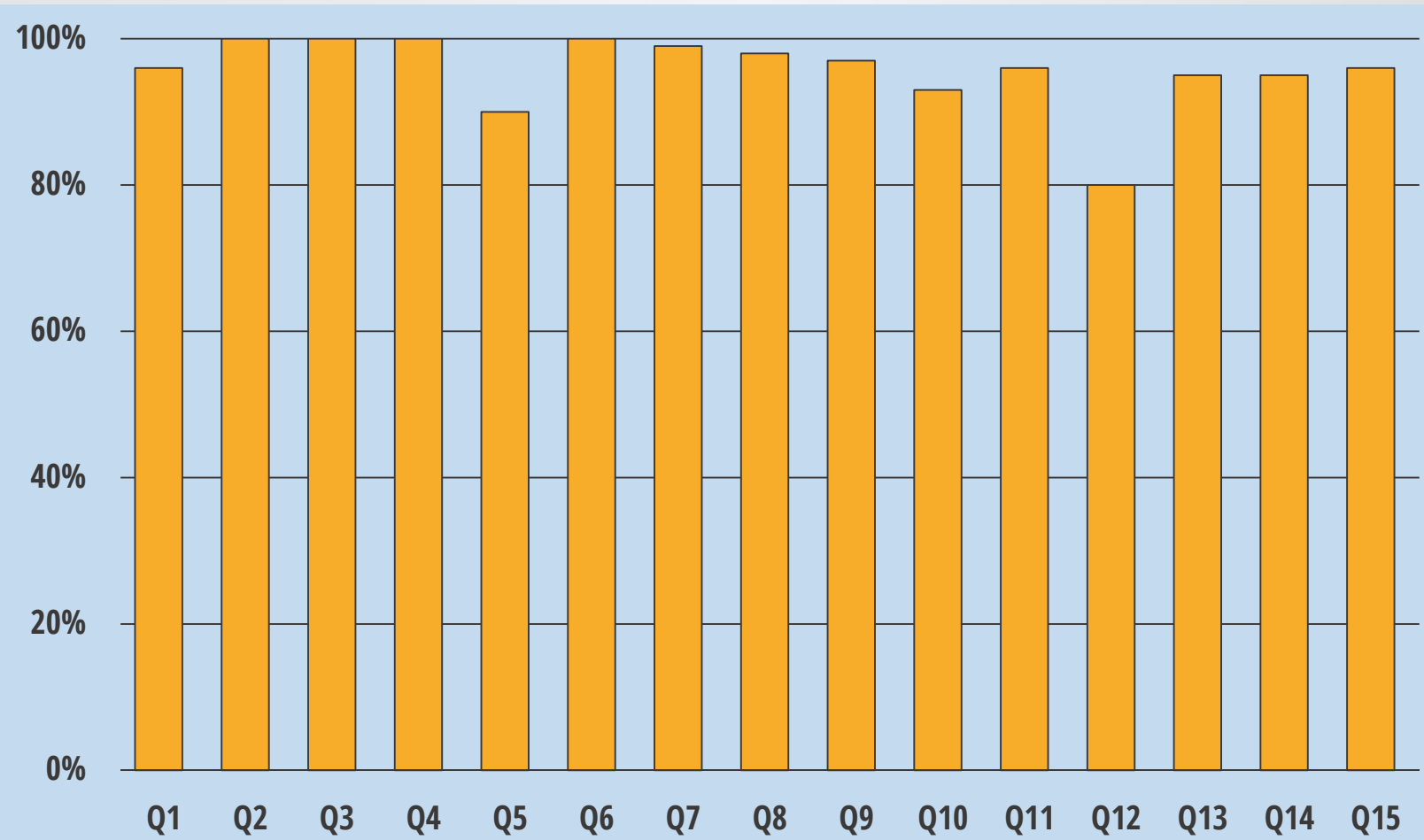
Learning & Problem Solving

- Separate relevant from irrelevant information.
- Integrate information to solve problems.
- Learn & apply new information.
- Use mathematical skills to solve real-world problems.

Communication

- Communicate ideas effectively.

Faculty Evaluations of Question Validity

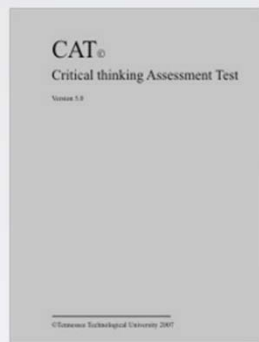


CAT Results with NSSE

(National Survey of Student Engagement)

NSSE Question	Beta Coefficient
(2a) Memorizing facts, ideas, or methods from your courses and reading so you can repeat them in pretty much the same form.	-.341 **
(3b) Number of books read on your own (not assigned) for personal enjoyment or academic enrichment.	.277 **
(11e) Thinking critically and analytically & (11m) Solving complex real-world problems	.244 **
(7h) Culminating Senior Experience (thesis capstone course, project, comprehensive exam, etc.)	.231 *

CAT Features



Test Booklet



Additional Information Pockets

15 item, mostly short answer essay

Paper and Online Administration

Engages Faculty in Scoring

Detailed Scoring Criteria

Strong Reliability and Validity

Sample Disclosed Question

A scientist working at a government agency believes that an ingredient commonly used in bread causes criminal behavior. To support the hypothesis the scientist notes the following evidence.

- 99.9% of the people who committed crimes consumed bread prior to committing crimes.
- Crimes rates are extremely low in areas where bread is not consumed.

Do the data described above strongly support the scientist's hypothesis? Yes____ No____

Are there other explanations from the data besides the scientist's hypothesis? If so, describe.

What kind of additional information or evidence would help support the scientist's hypothesis?

Critical Thinking Skill Set 1

How strongly does information support an idea.

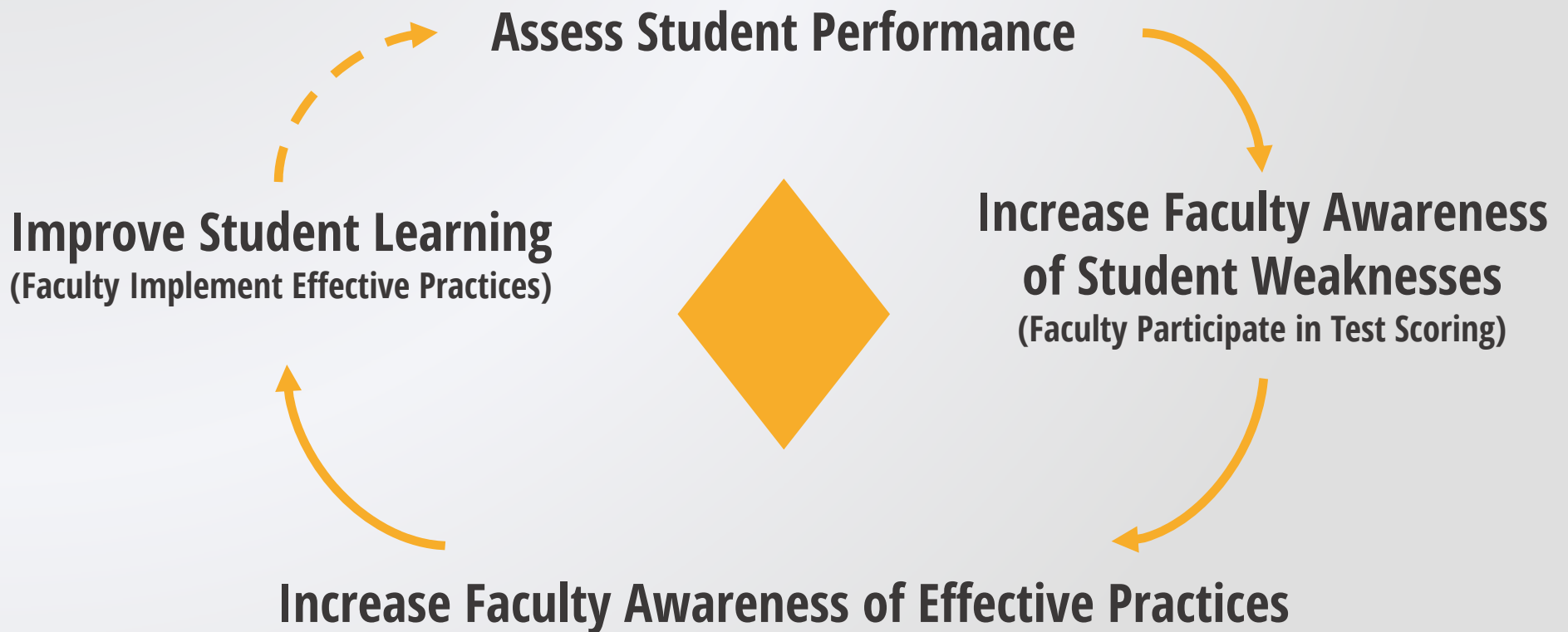


Provide alternative interpretations for information or observations that have several possible interpretations.



Identify additional information or evidence needed to evaluate the alternative interpretations.

Closing the Loop in Assessment and Quality Improvement



Ensuring Reliability of Scoring

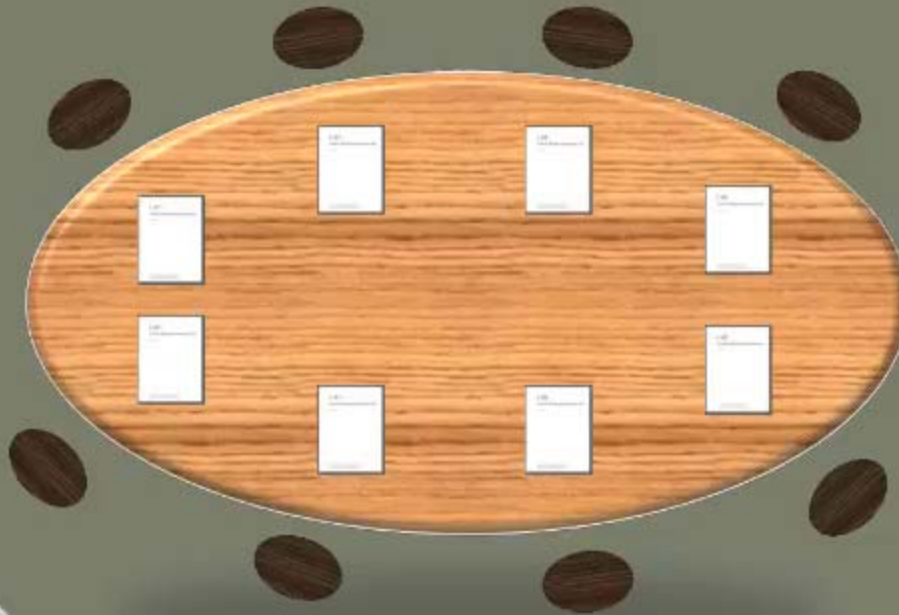


This section to be completed by faculty scorers

Answer Selection: Correct = ● Incorrect = ✕ ✓ ⊖

#	Grader 1	Grader 2	Grader 3
1	⓪ ①	⓪ ①	⓪ ①
2	⓪ ① ② ③	⓪ ① ② ③	⓪ ① ② ③
3	⓪ ① ② ③	⓪ ① ② ③	⓪ ① ② ③
4	⓪ ① ② ③ ④	⓪ ① ② ③ ④	⓪ ① ② ③ ④
5	⓪ ①	⓪ ①	⓪ ①
6	⓪ ① ② ③	⓪ ① ② ③	⓪ ① ② ③
7	⓪ ① ②	⓪ ① ②	⓪ ① ②
8	⓪ ①	⓪ ①	⓪ ①
9	⓪ ① ②	⓪ ① ②	⓪ ① ②
10	⓪ ① ② ③ ④	⓪ ① ② ③ ④	⓪ ① ② ③ ④
11	⓪ ① ②	⓪ ① ②	⓪ ① ②
12	⓪ ①	⓪ ①	⓪ ①
13	⓪ ① ② ③	⓪ ① ② ③	⓪ ① ② ③
14	⓪ ① ② ③ ④ ⑤	⓪ ① ② ③ ④ ⑤	⓪ ① ② ③ ④ ⑤
15	⓪ ① ② ③	⓪ ① ② ③	⓪ ① ② ③

First Scoring



Thank You

www.CriticalThinkingTest.org



Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

National Dissemination Model

