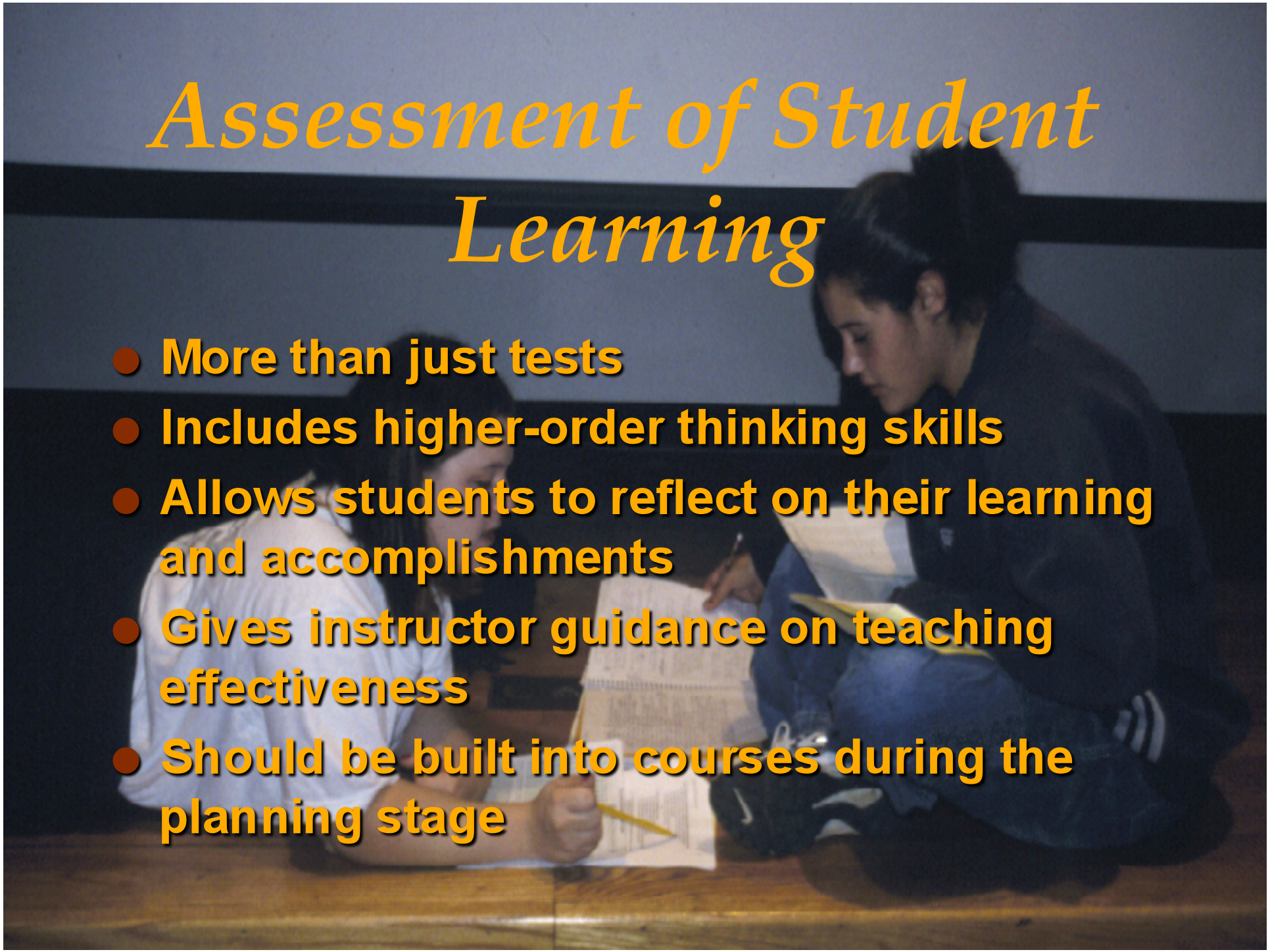
Assessment of Student Learning

How do you do it?



Assessment of Student Learning

- More than just tests
- Includes higher-order thinking skills
- Allows students to reflect on their learning and accomplishments
- Gives instructor guidance on teaching effectiveness
- Should be built into courses during the planning stage

Summative Assessment

- End of instructional unit, or end of term
- Post-mortem
- Little opportunity for intervention
- Often high stakes and basis for grades

Formative Assessment

- Provides useful feedback about learning
- Determines nature of student understanding
- Provides opportunities for intervention
- Usually low stakes, although can be graded

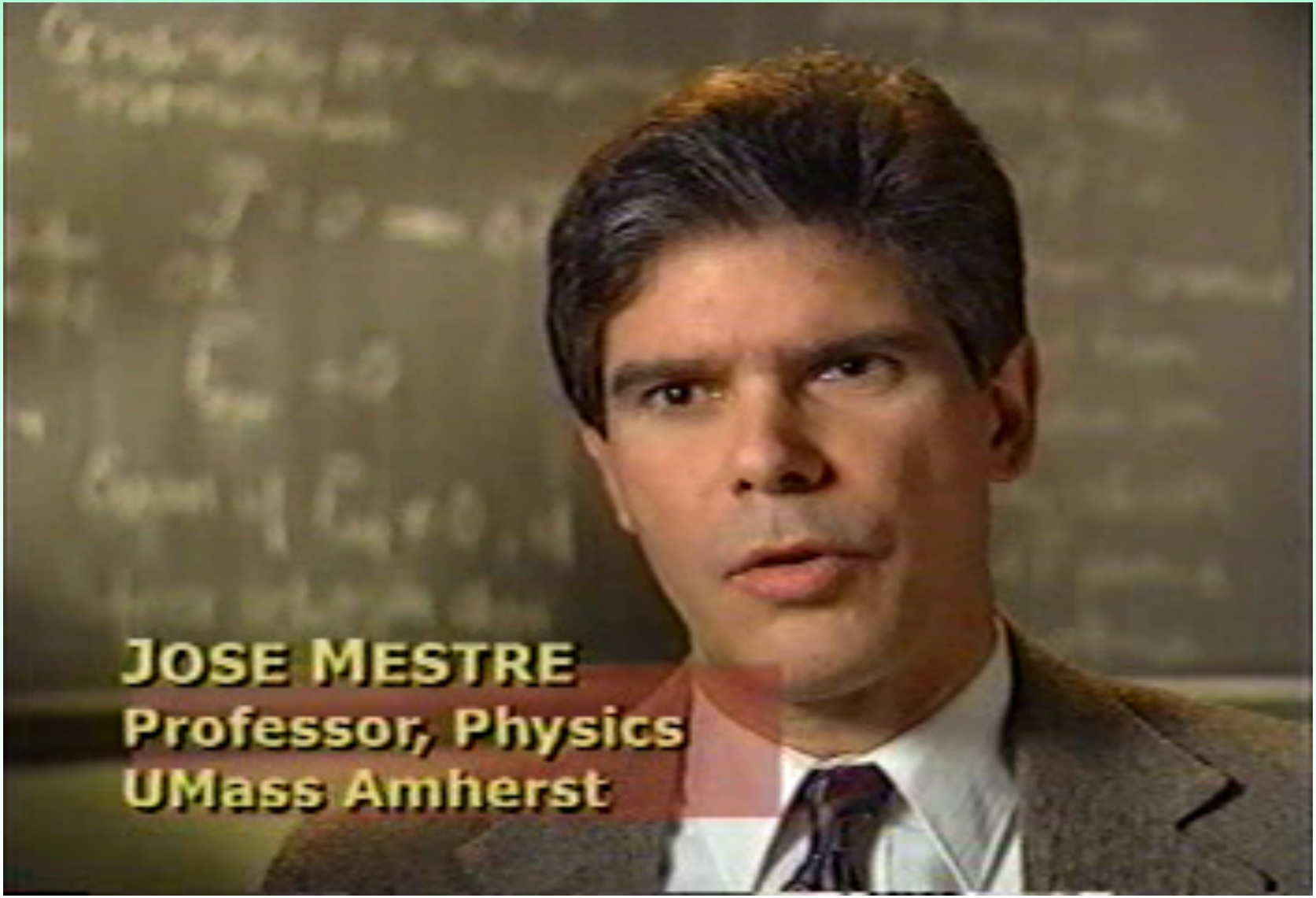
Bloom's Taxonomy

Competence	*Skills Demonstrated*
Knowledge (Information)	list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
Comprehension	summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
Application	apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover
Analysis	analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer
Synthesis	combine, integrate, modify, rearrange, substitute, plan, create, design, invent, what if?, compose, formulate, prepare, generalize, rewrite
Evaluation	assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize

Useful Assessment Methods

- "***Stop and Think" techniques***
- ***Robust Exams***
- ***Rubrics and "Primary Trait Analysis"***
- Other Active-Learning Techniques
  - Gallery Walk
  - Concept Maps
  - Student Reports, Journals, Portfolios

Stop and Think: Predictive Demonstrations



Stop and Think: Low-Stakes Writing

- Minute paper -- summarize a topic explored during the class
- "Muddiest Point" -- What concept or idea in today's class is the most unclear to you? What question do you have about it?

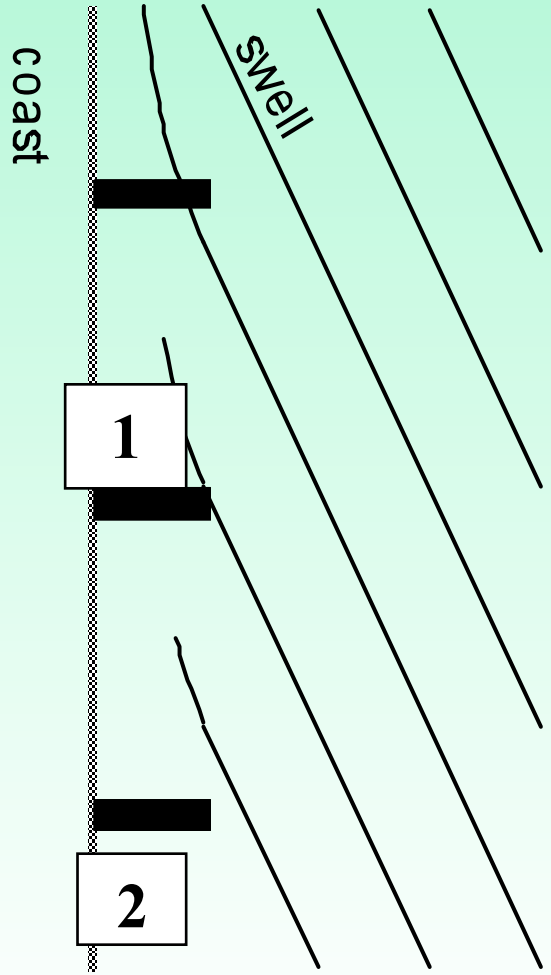
Robust Exams

- Multiple choice can be good!
- Reasoning
- Solve problems
- Interpret graphs and diagrams
- Rapid feedback on answers
- Foster Interaction
- Ability to re-take

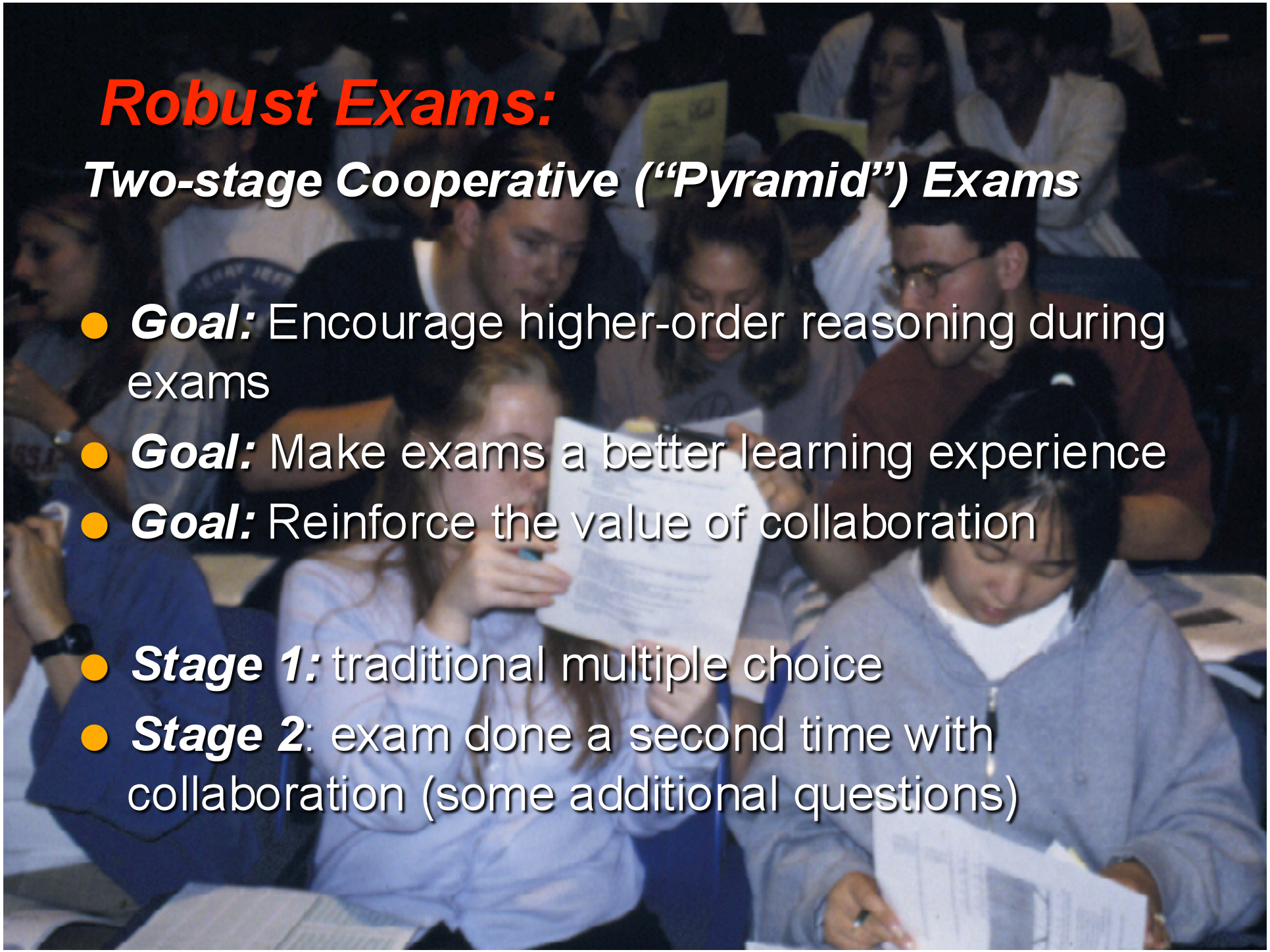
Example: Robust Exam Questions

In the situation illustrated in the diagram , what will happen over time?

A) Sand will accumulate at locations 1 and 2.
B) Sand will erode from locations 1 and 2.
C) Sand will accumulate at location 1 and erode at location 2.
D) Sand will erode at location 1 and accumulate at location 2.



- Synthesis
- Evaluation



Robust Exams:

Two-stage Cooperative ("Pyramid") Exams

- ***Goal:*** Encourage higher-order reasoning during exams
- ***Goal:*** Make exams a better learning experience
- ***Goal:*** Reinforce the value of collaboration

- ***Stage 1:*** traditional multiple choice
- ***Stage 2***: exam done a second time with collaboration (some additional questions)

Two-stage Cooperative Exams

Rubrics

- Provide clear-cut criteria
- Improve consistency in assigning grades
- Lets students know what is important
- Basis for "Primary Trait Analysis"

GEO 415: SCORING RUBRIC FOR WRITTEN QUESTIONS

grade	criteria
5	questions answered completely; logic of solution is clear; factual information is correct; all calculations are free of errors; conclusions are accurate
4	questions answered with some supporting documentation; logic of solution may have minor lapses; factual information is essentially correct, although not always clear; calculations may have minor errors; conclusions are essentially correct within a reasonable deviation
3	questions answered; logic of solution may have large uncertain components; some factual information is missing; calculations show some errors; conclusions deviate from the desired path
2	questions not answerd completely; logic of solution difficult to follow; factual information not always correct or shown; calculations have large errors; conclusions not always within the realm of reasonable deductions
1	questions are mostly not solved; logic of solution is unclear; information is missing or incorrect; calculations have large errors; conclusions are unreasonable.

Criteria Analysis

Logic _____
Information _____
Calculations _____
Conclusions _____

Comments:

Need help in building a rubric?

http://rubistar.4teachers.org/index.php

Other Active-Learning Techniques

- Oral or poster reports of projects
- Structured debates
- “Town meeting” forum
- Gallery Walks
- Concept Maps

Concept Maps

Active-learning method that enables students to reflect upon relationships in complex systems and ideas