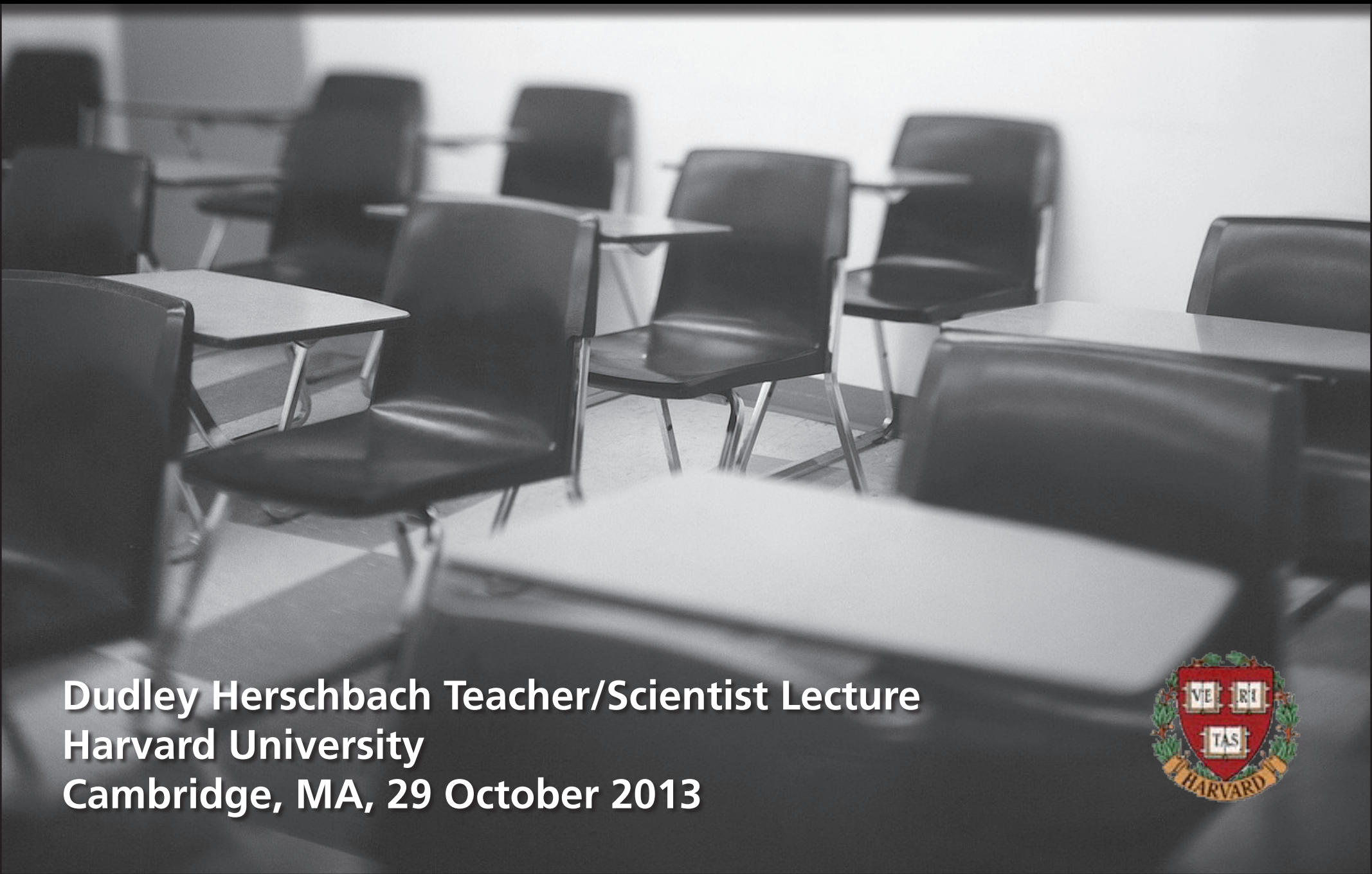
Assessment:
The silent killer of learning



Dudley Herschbach Teacher/Scientist Lecture
Harvard University
Cambridge, MA, 29 October 2013

Assessment:
The silent killer of learning

Dudley Herschbach Teacher/Scientist Lecture
Harvard University
Cambridge, MA, 29 October 2013

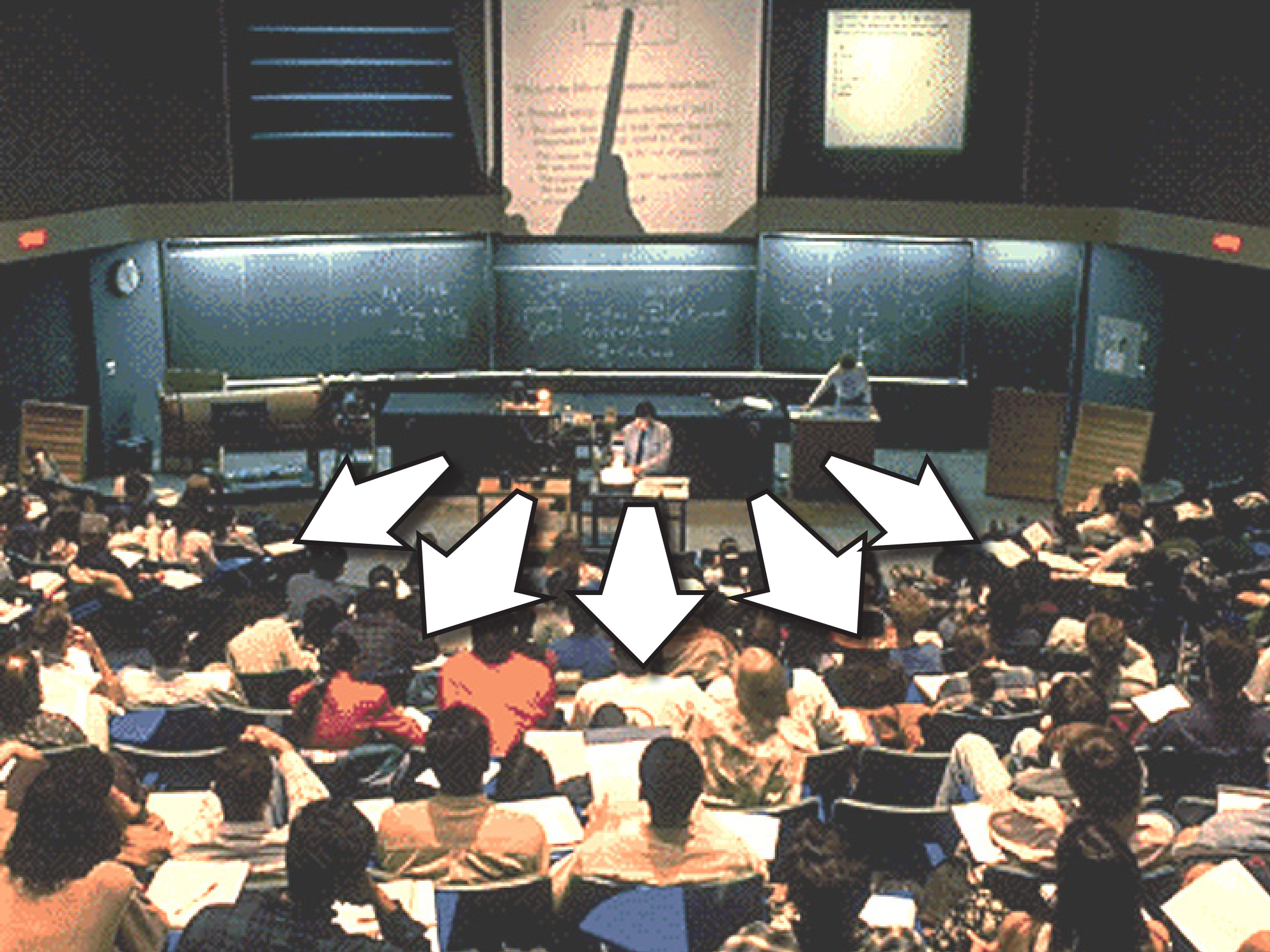

kosten
1. die Kosten (pl.)
2. kostbar
krank
455
1. die Krankheit, —, —en
377
magnificen
glo
1. magnifice
2. master
428
kennen irreg.
kannte-gekannt
1. kennen-lernen
2. erkennen
3. bekannt
4. der Bekannte (adj. as n.)
lendid
430
das Kind, —(e)s, —er
1. kindisch
2. kindlich
cow
der Kellner, —s, —
1. der Keller, —s, —
poco rit

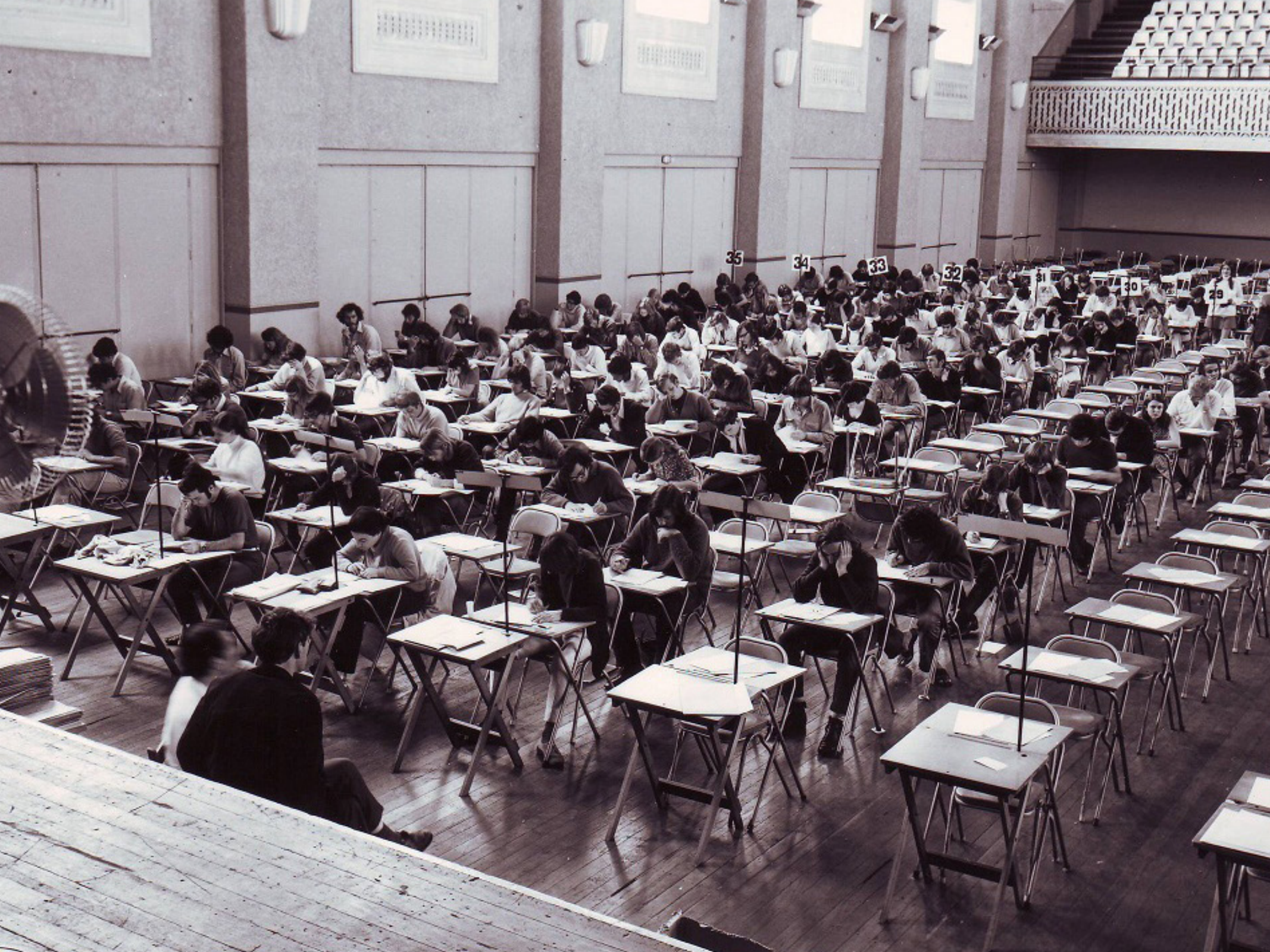

kosten
1. die Kosten (pl.)
2. kostbar
krank
die Krankheit, —, —en
455
377
kennen
kannte-gekannt
1. kennen-lernen
2. erkennen
3. bekannt
4. der Bekannte (adj. as n.)
428
Verizon 3G
4:20 PM
Flashcard
Back
23 of 100
pedantic
adj. ostentatious in one's learning
Search
Popular
Subjects
Grade Levels
Standardized

35% retained after 1 week

we only guarantee
they'll pass the test

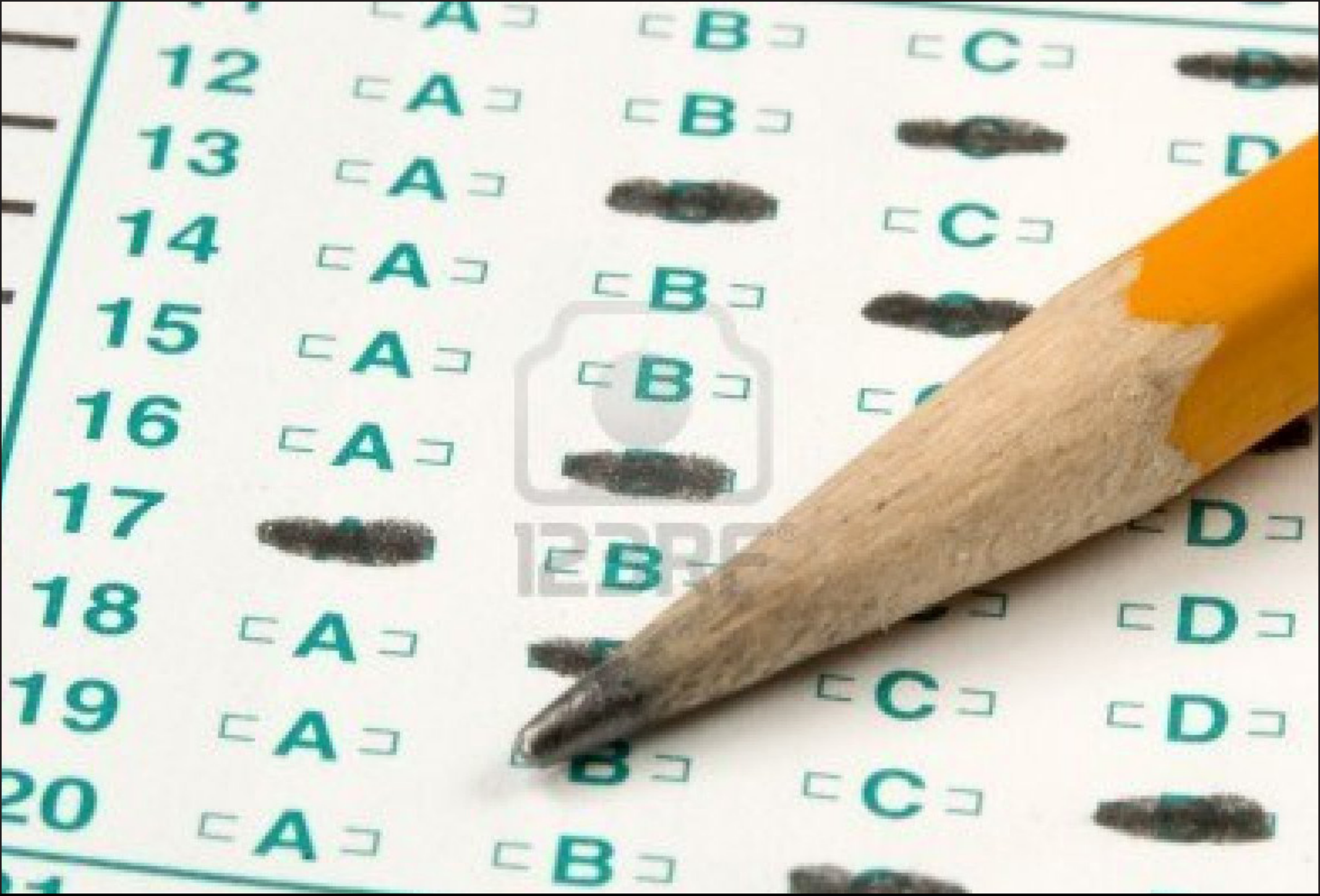
5-minute university



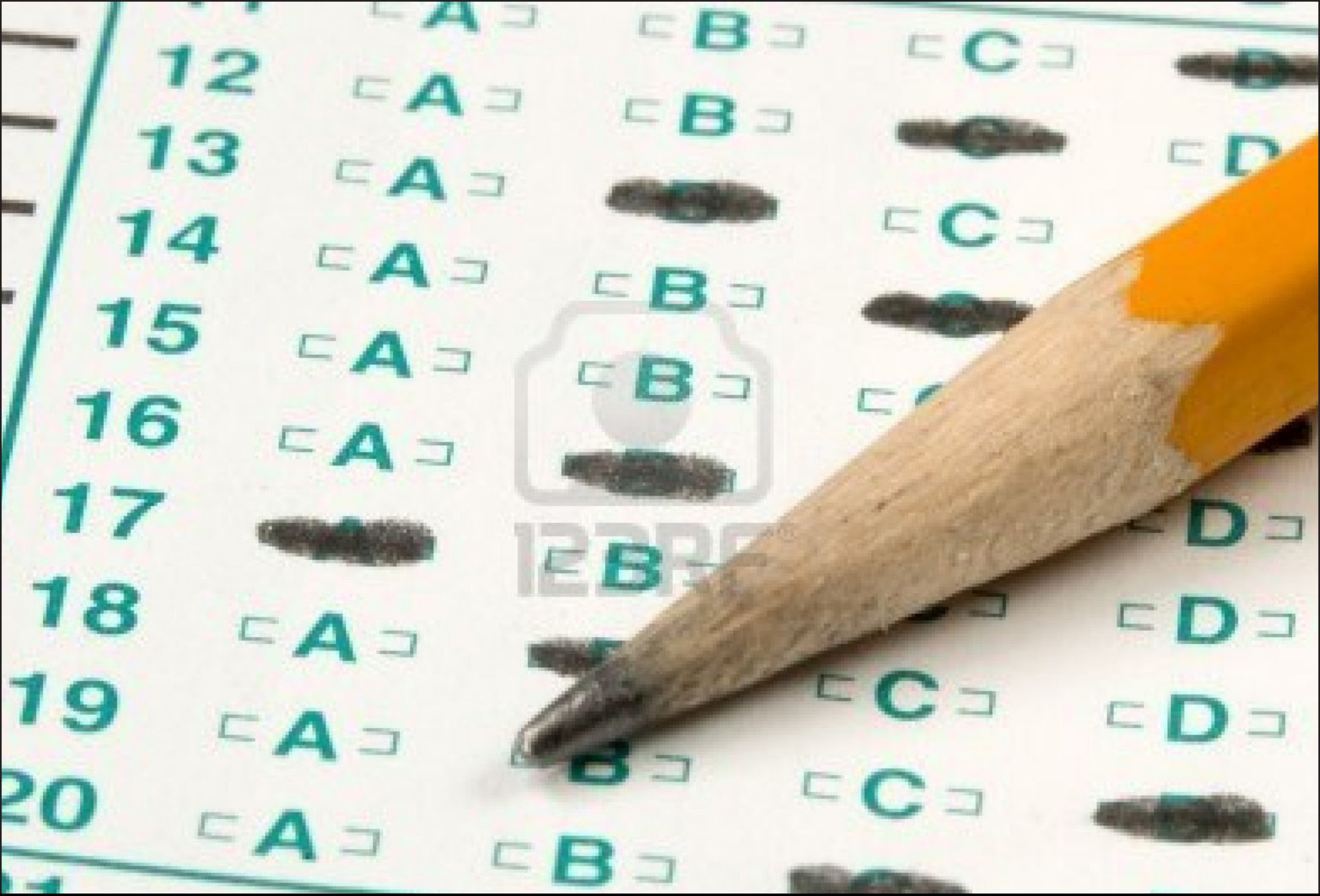

35
34
33
32
31
30
29

assessment focussed on ranking and classifying,

not on developing 21st century skills

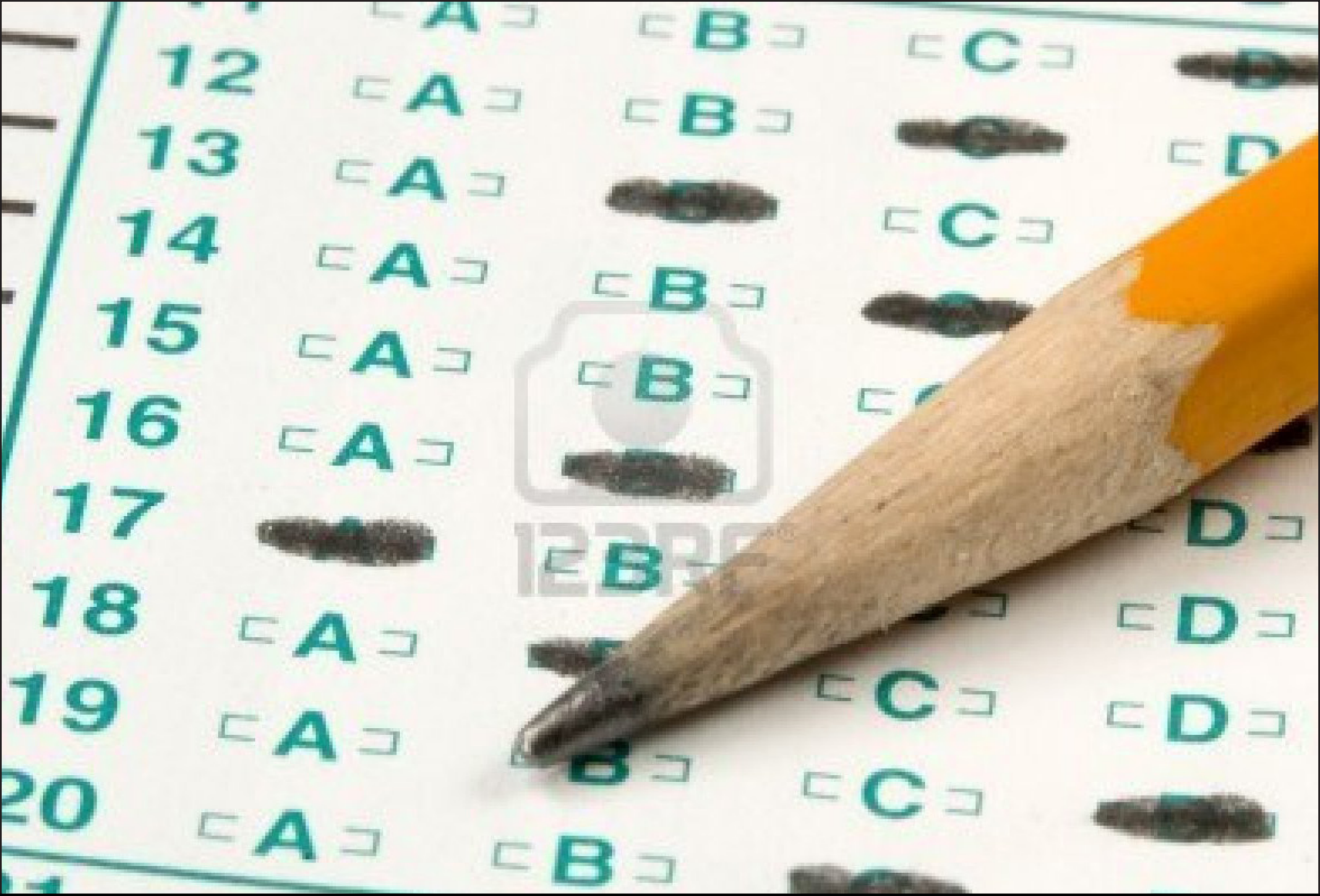


1 purposes



1 purposes

2 problems



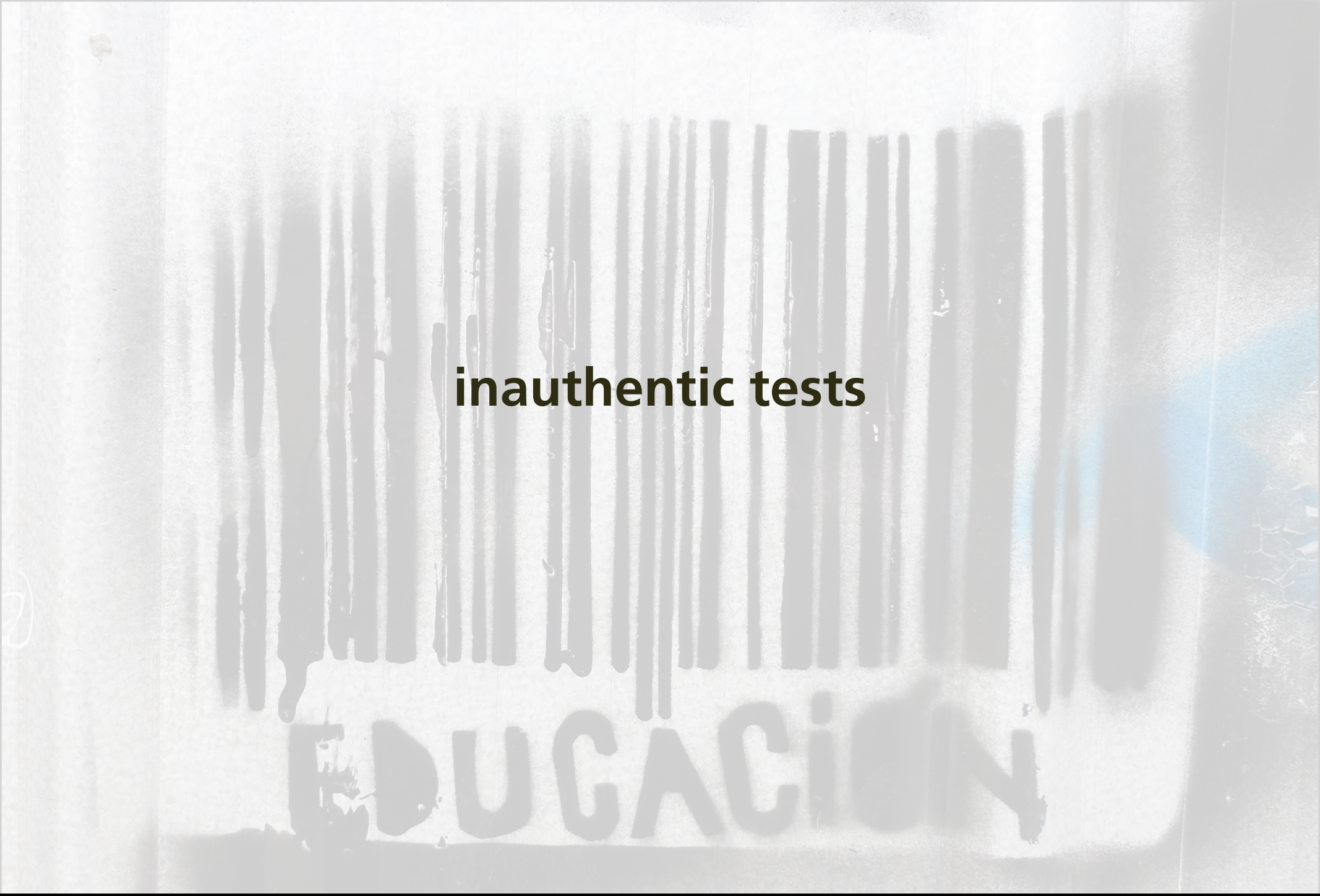
1 purposes 2 problems 3 improvements

how many different purposes
of assessment you can think of?

1. rate students
2. rate professor and course
3. motivate students to keep up with work
4. provide feedback on learning to students
5. provide feedback to instructor
6. provide instructional accountability
7. improve teaching and learning

1 purposes

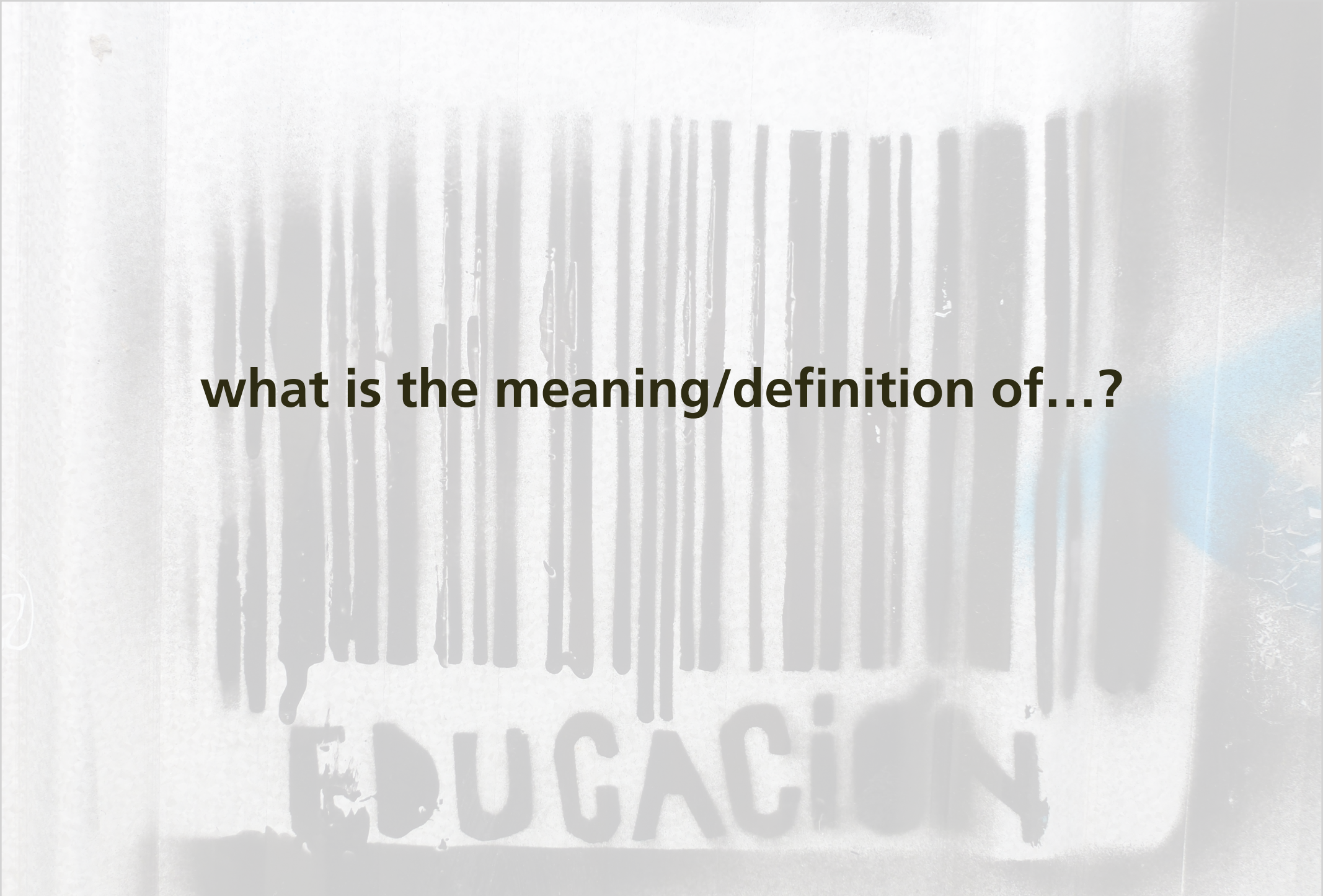
2 problems



inauthentic tests

1 purposes

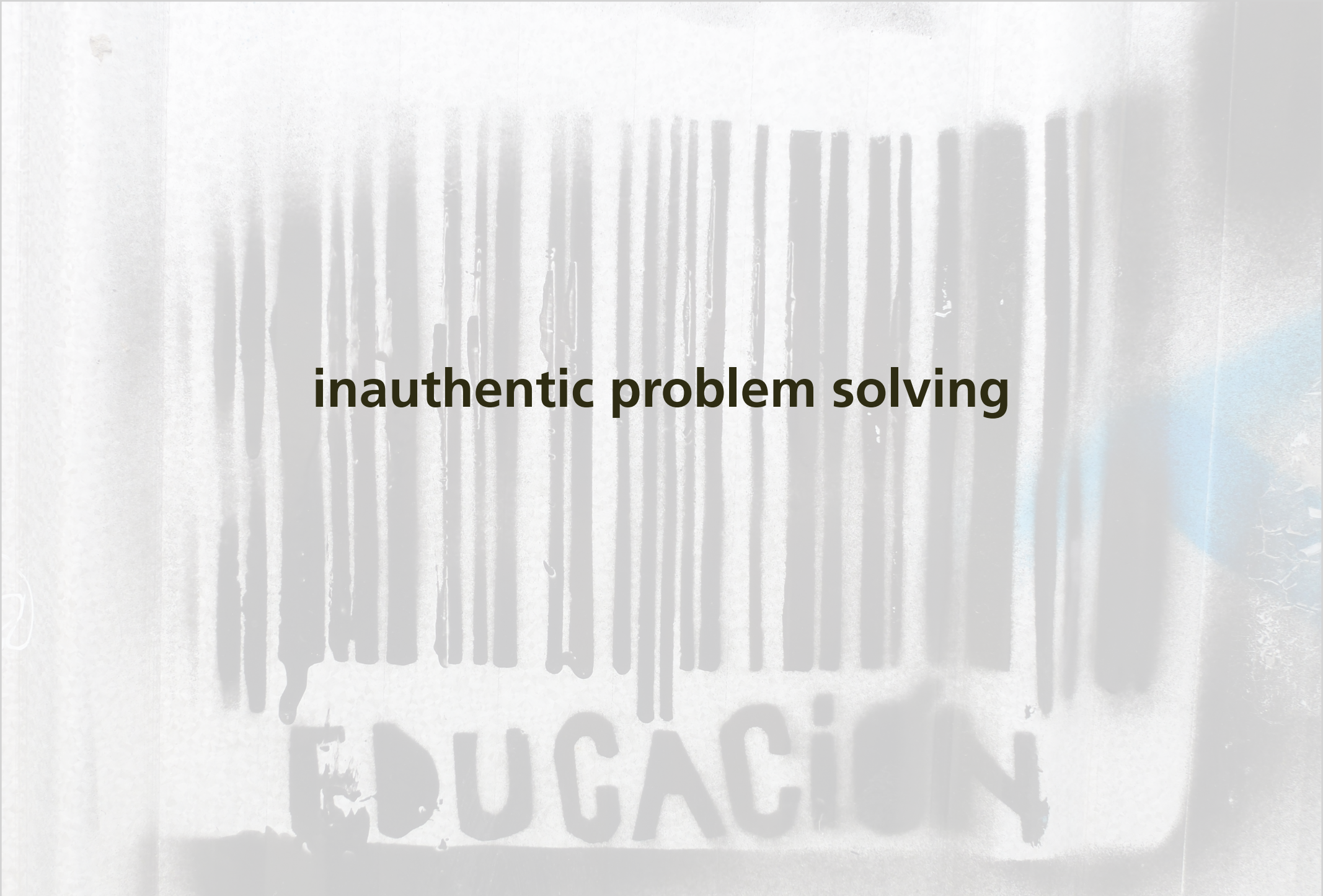
2 problems



what is the meaning/definition of…?

1 purposes

2 problems

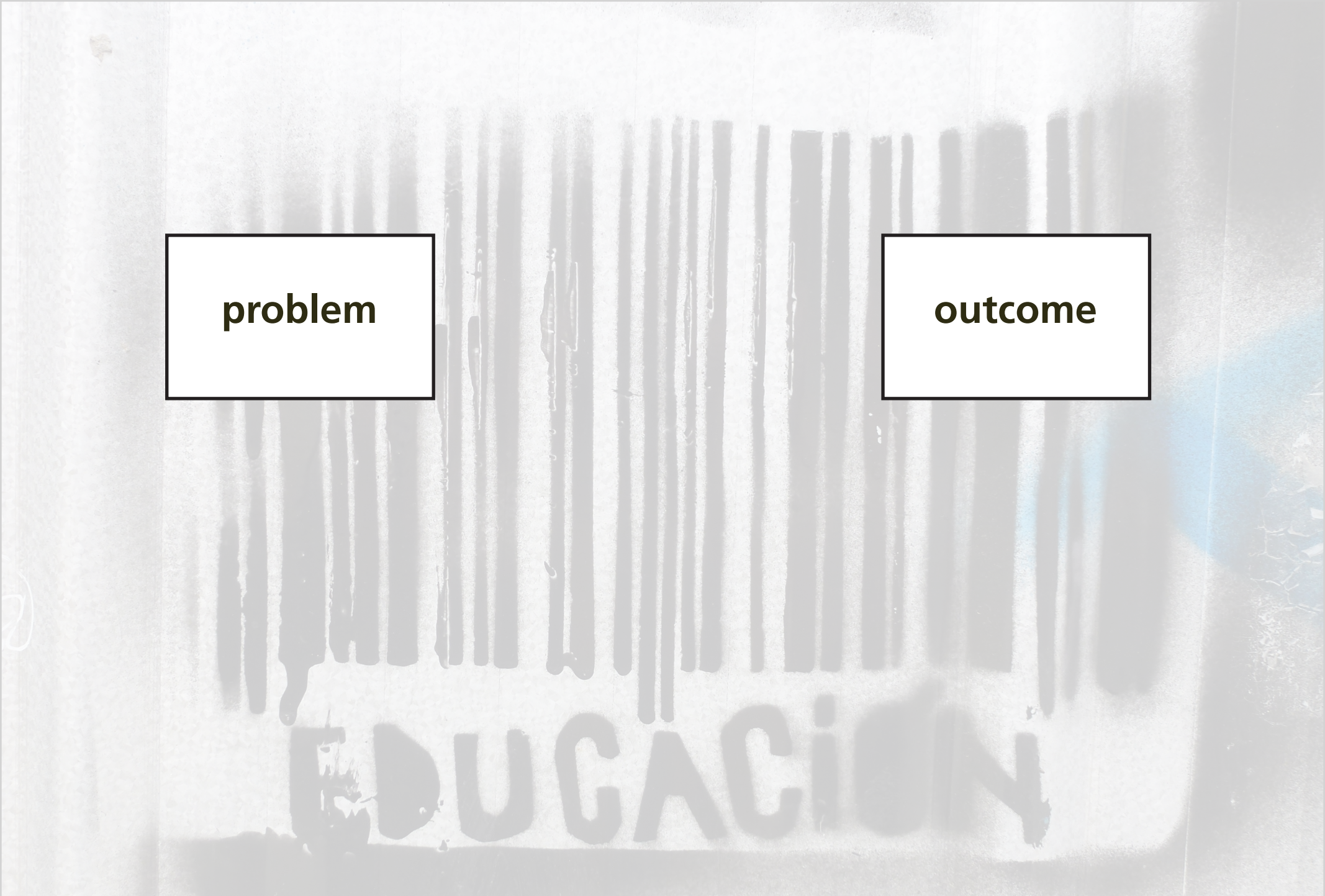


1 purposes

2 problems

1 purposes

2 problems



1 purposes

2 problems

problem

outcome

KNOWN

1 purposes

2 problems

1 purposes

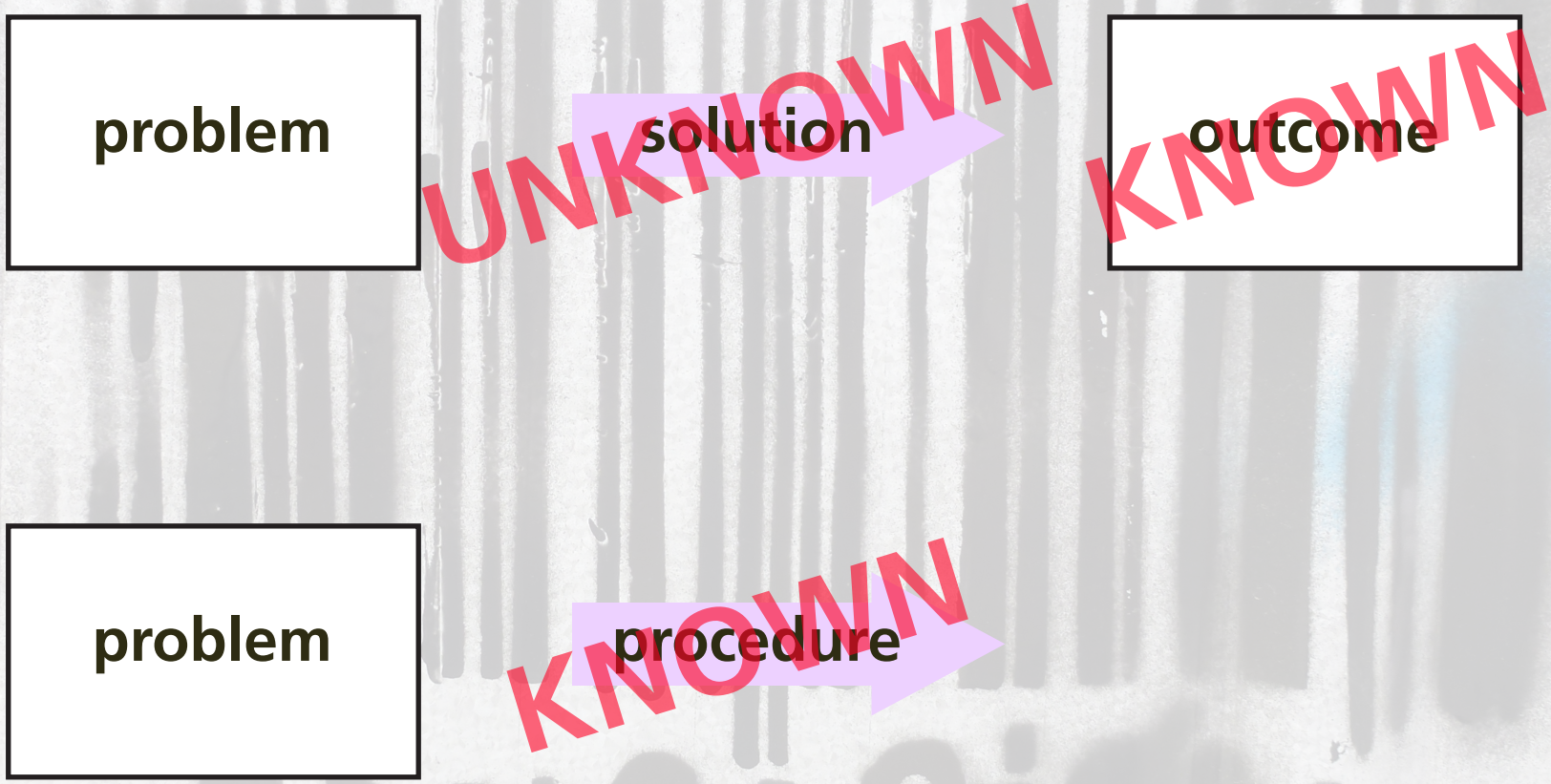
2 problems

1 purposes

2 problems

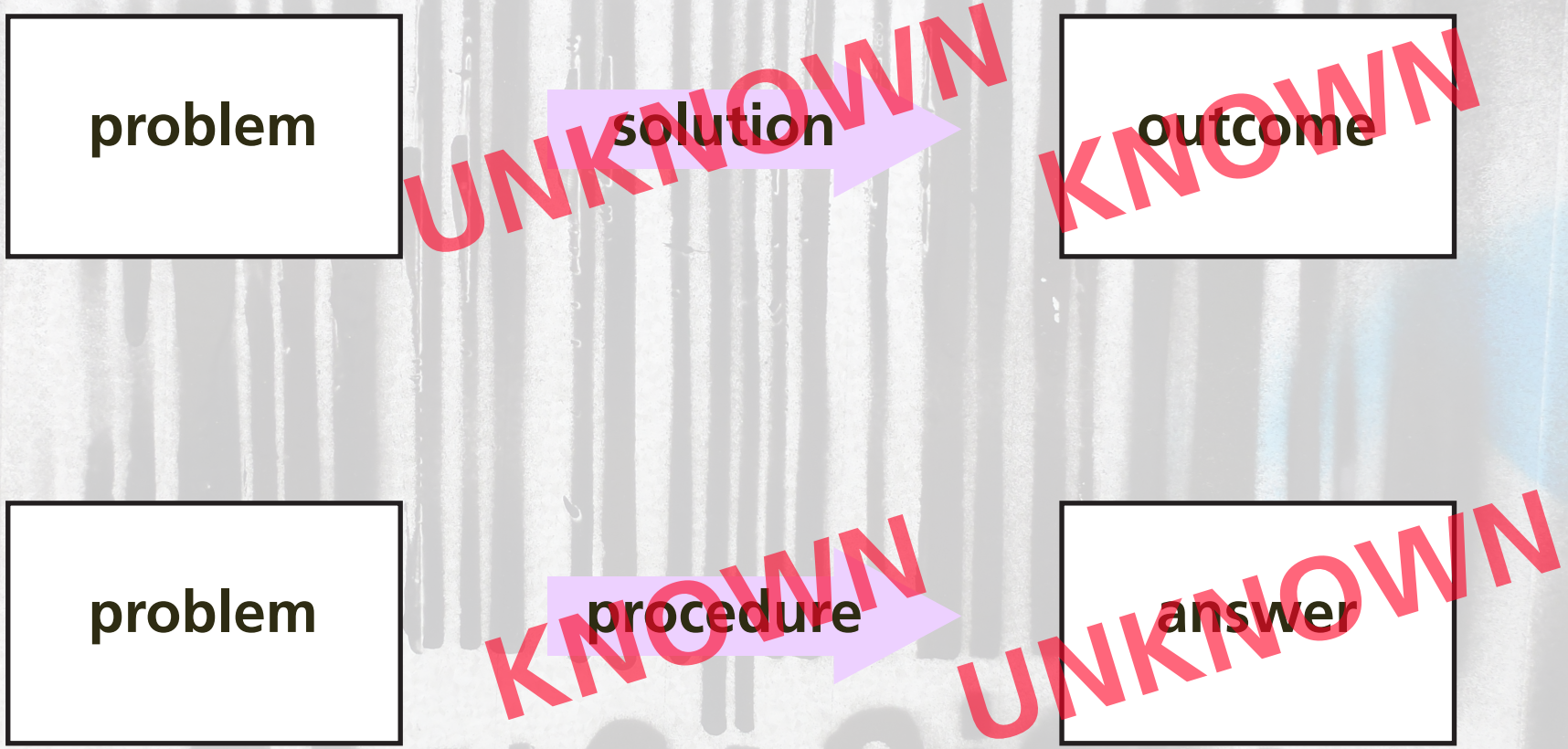
1 purposes

2 problems



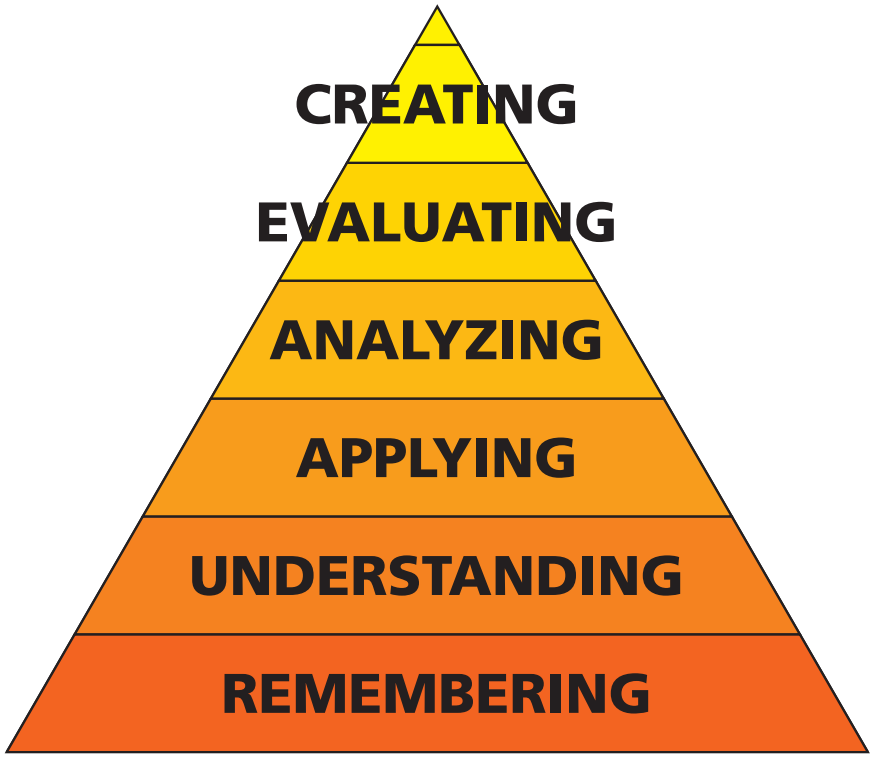
1 purposes

2 problems



1 purposes 2 problems

Thinking skills



1 purposes

2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

1 purposes

2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

Requires:

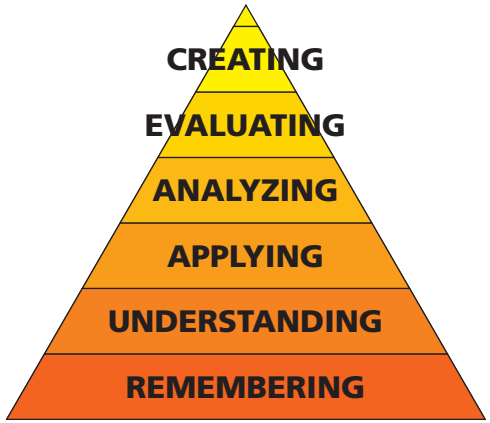
Assumptions
Developing a model
Applying that model

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

Requires:

Assumptions
Developing a model
Applying that model



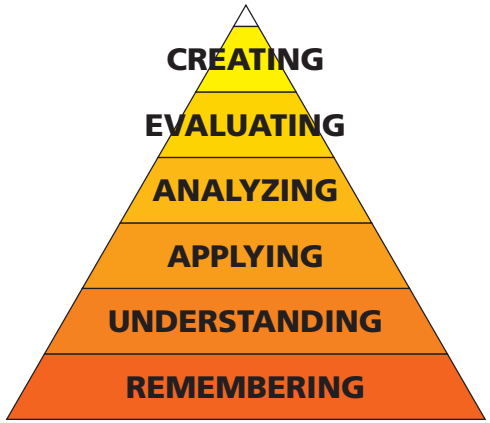
1 purposes 2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. **On average people shop for 2 hours.**

How long do you have to wait before someone frees up a space?

Requires:

Assumptions
Developing a model
Applying that model



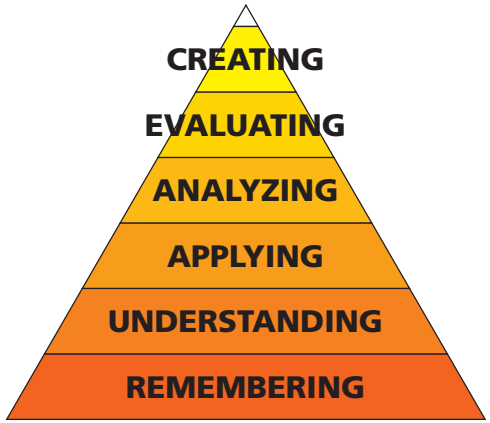
1 purposes 2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. On average people shop for 2 hours.

Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

Assumptions
Developing a model
Applying that model



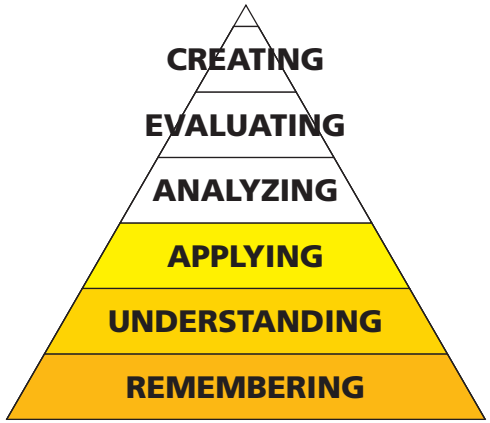
1 purposes 2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces. On average people shop for 2 hours.

Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?

Requires:

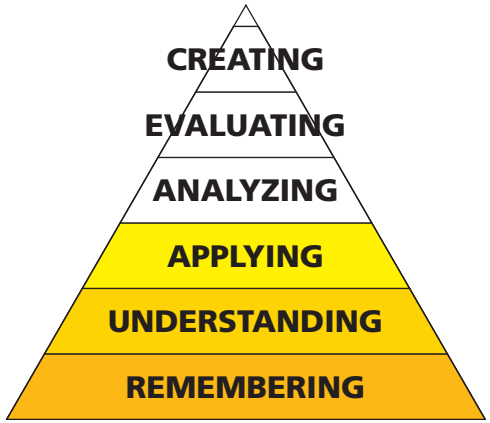
Assumptions
Developing a model
Applying that model



1 purposes 2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?



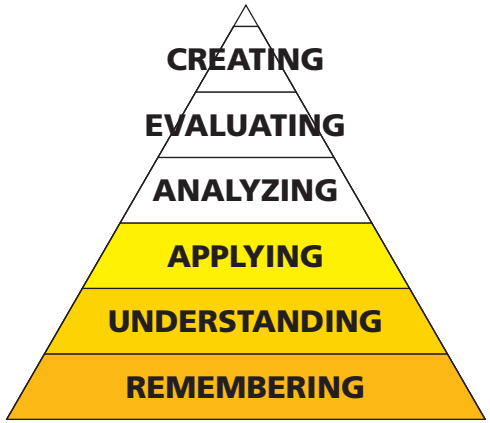
1 purposes

2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

How long do you have to wait before someone frees up a space?

$$t_{wait} = \frac{T_{shop}}{N_{spaces}}$$



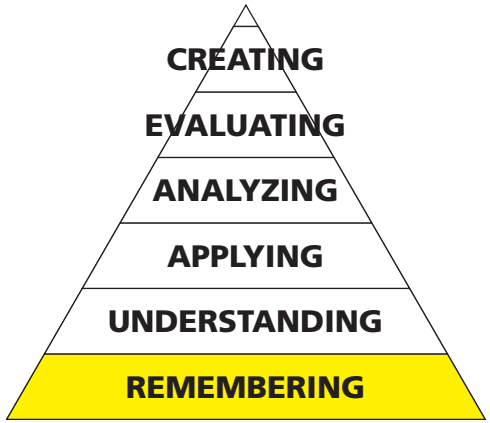
1 purposes

2 problems

On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, where people are known to shop, on average, for 2 hours. You circle around, but there are no empty spots. You decide to wait at one end of the lot, where you can see (and command) about 20 spaces.

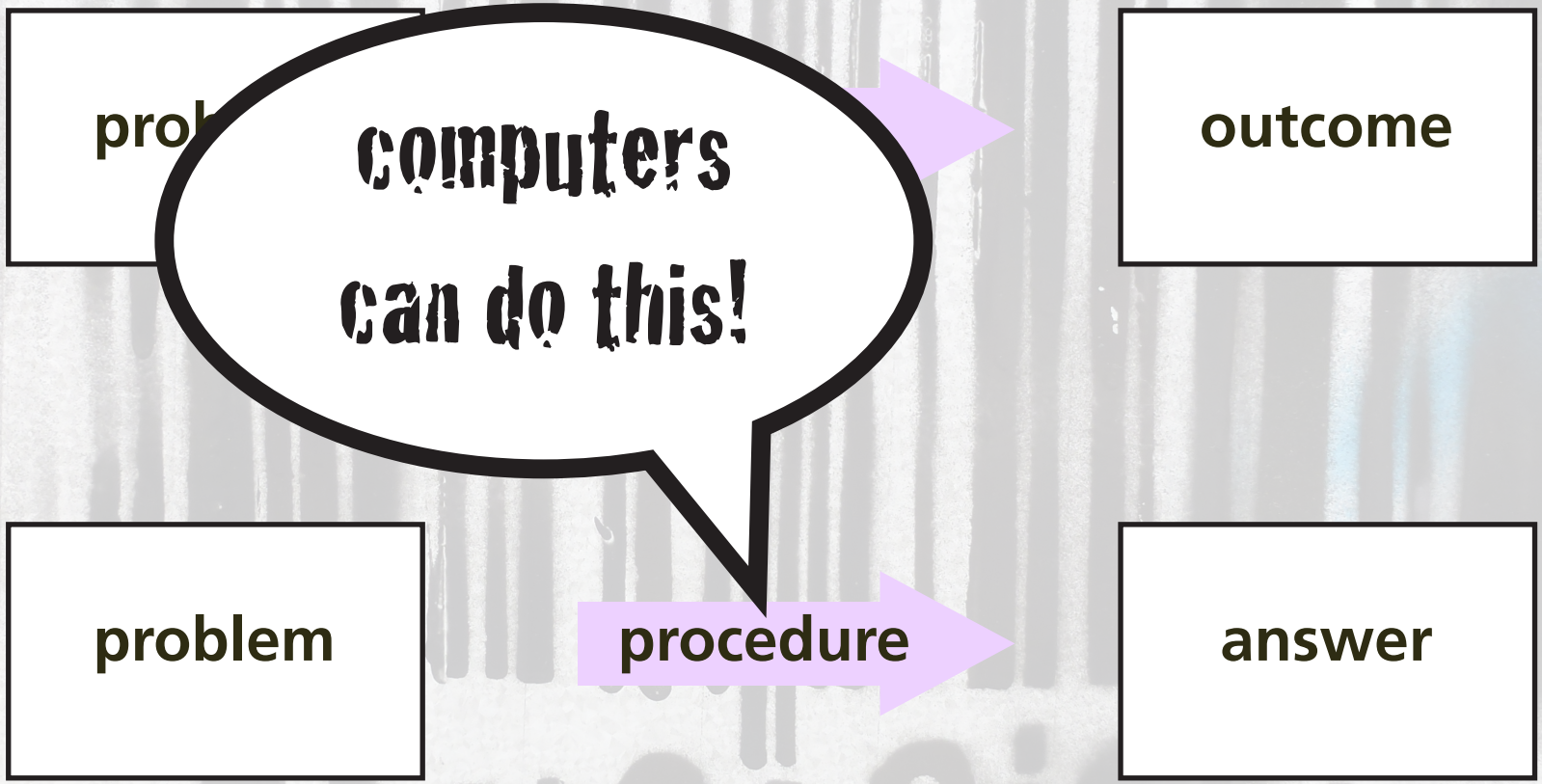
How long do you have to wait before someone frees up a space?

$$t_{wait} = \frac{T_{shop}}{N_{spaces}}$$



1 purposes

2 problems



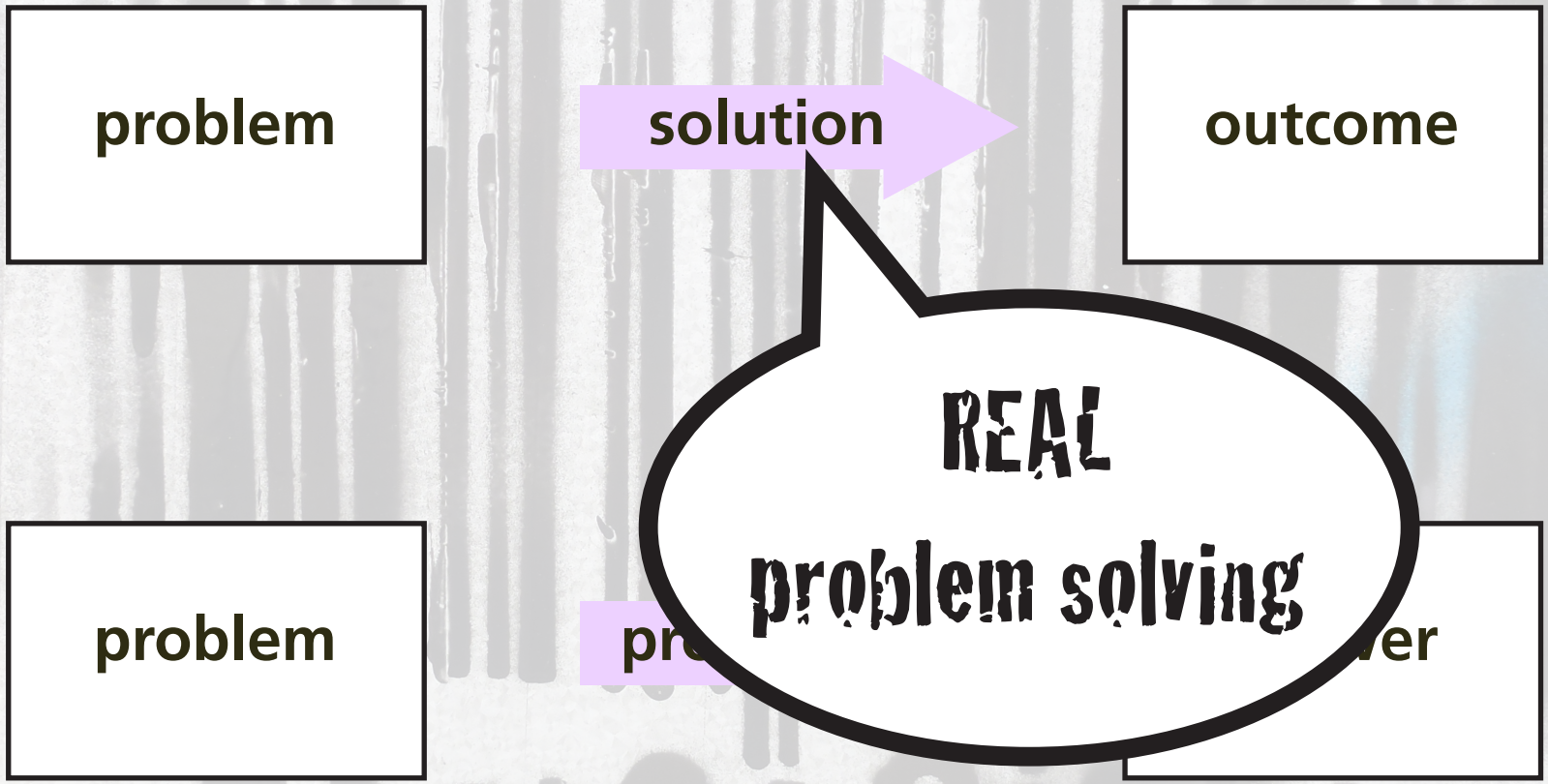
1 purposes 2 problems

1 purposes

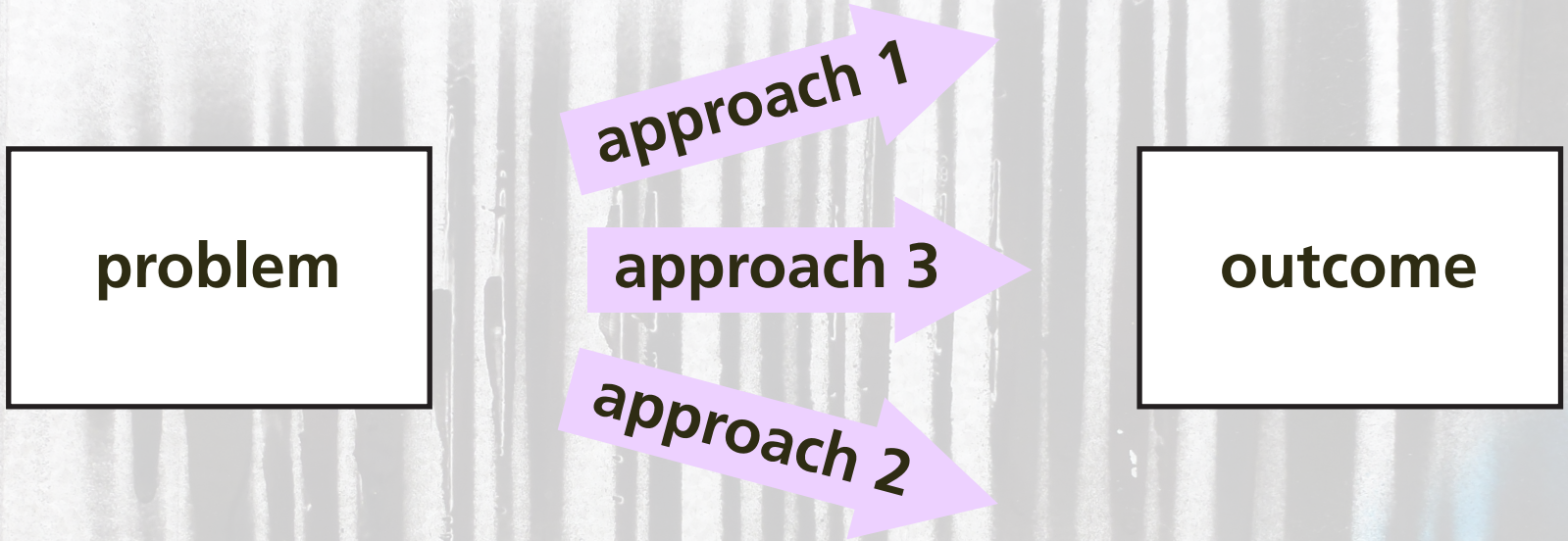
2 problems

1 purposes

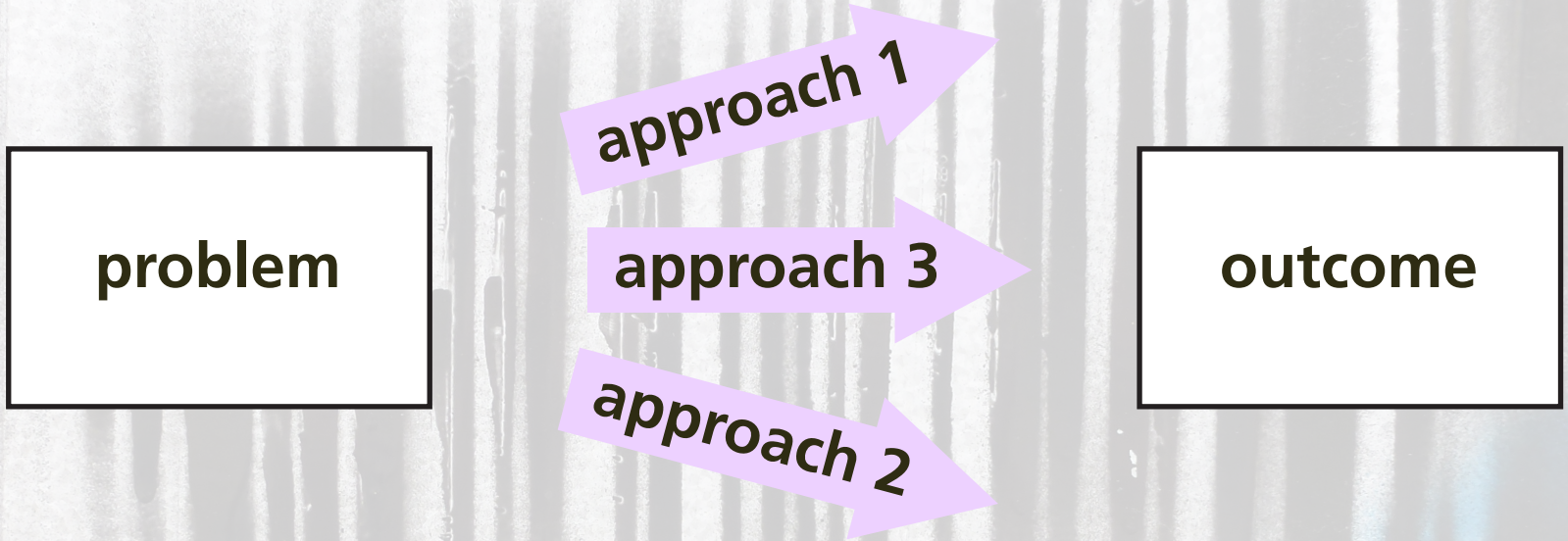
2 problems



1 purposes 2 problems



1 purposes 2 problems



grading incompatible with real problem solving

1 purposes 2 problems

1 purposes

2 problems

isolation

1. purposes
2. problems

(4) We will use spherical coordinates: $0 \le \rho \le \sqrt{4}$, $0 \le \theta \le 2\pi$, $0 \le \varphi \le \pi$. The integral is thus:

$$\int_{\rho=0}^{\sqrt{4}} \int_{\theta=0}^{2\pi} \int_{\varphi=0}^{\pi} (\rho \cos\varphi)(\rho \sin\varphi)\, \rho^2 \, d\varphi \, d\theta \, d\rho$$

$$= \left\{ \int_{\rho=0}^{\sqrt{4}} \rho^3 \, d\rho \right\} \left\{ \int_{\theta=0}^{2\pi} d\theta \right\} \left\{ \frac{1}{2} \int_{\varphi=0}^{\pi} \sin(2\varphi)\, d\varphi \right\} = \boxed{0}$$

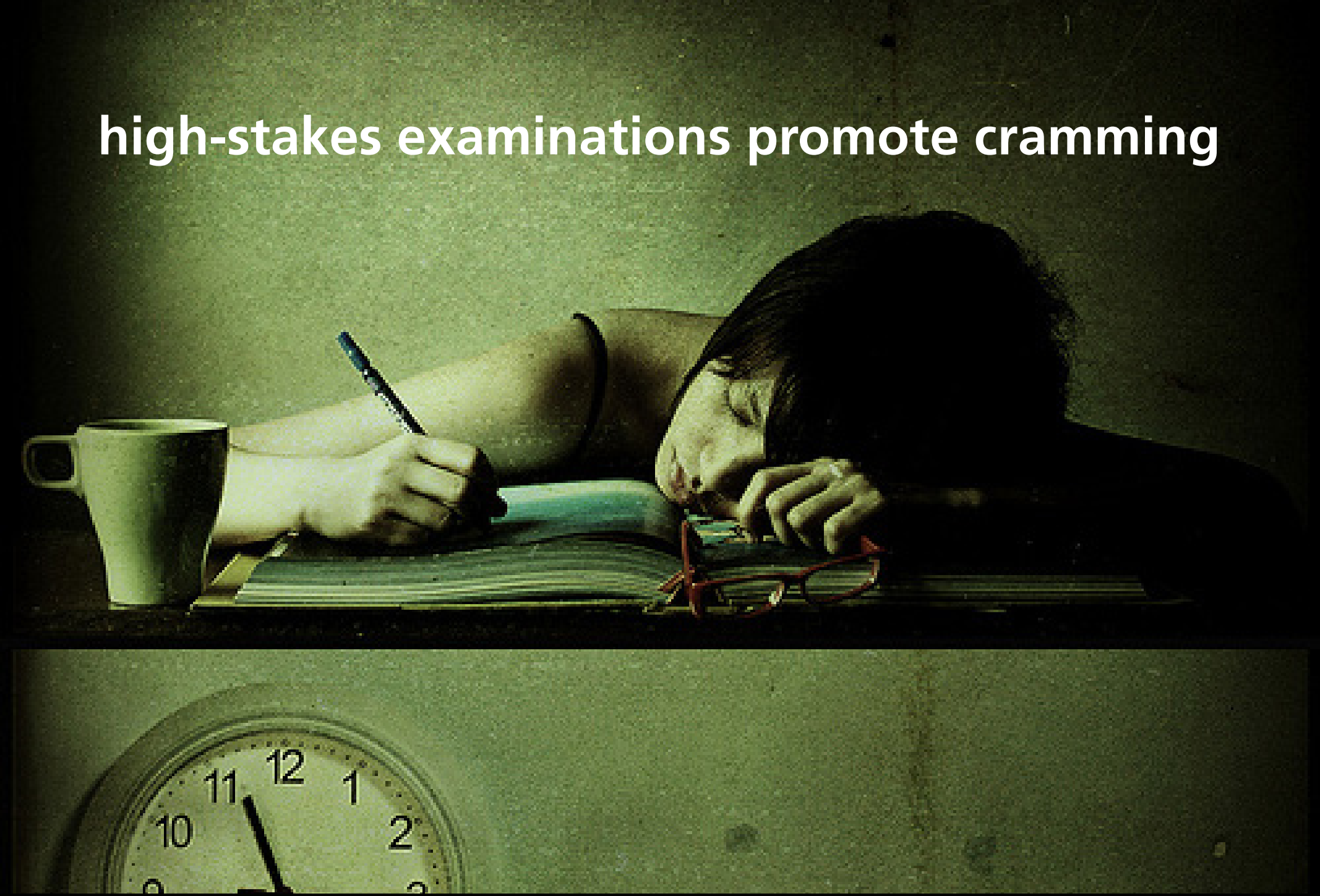
Since the third integral equals 0.

---

(5) Direction vectors for the plane are

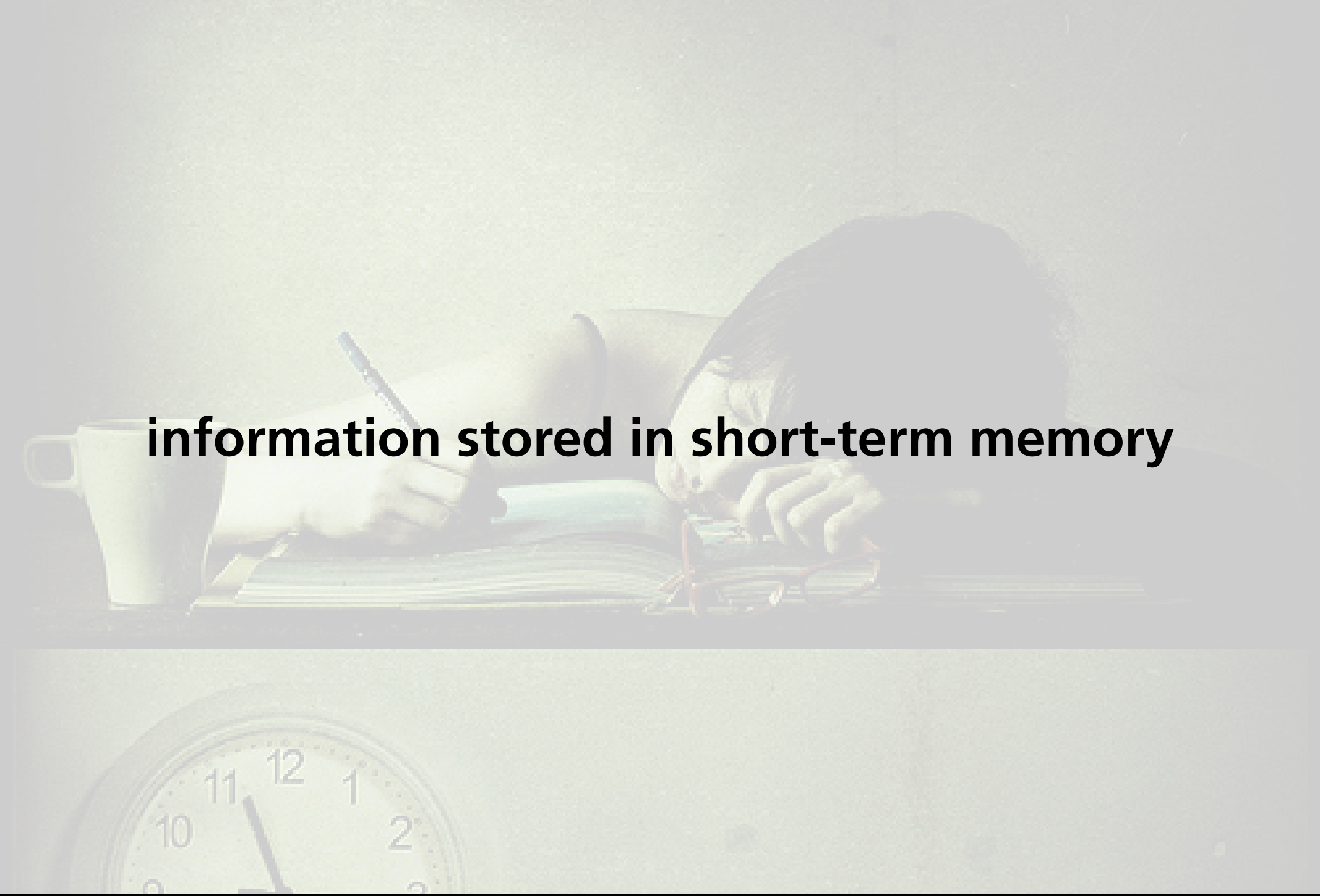
$$\begin{pmatrix} 1 \\ 1 \\ 0 \end{pmatrix} \quad \text{and} \quad \begin{pmatrix} 0 \\ 1 \\ -1 \end{pmatrix}$$

high-stakes examinations promote cramming



1 purposes

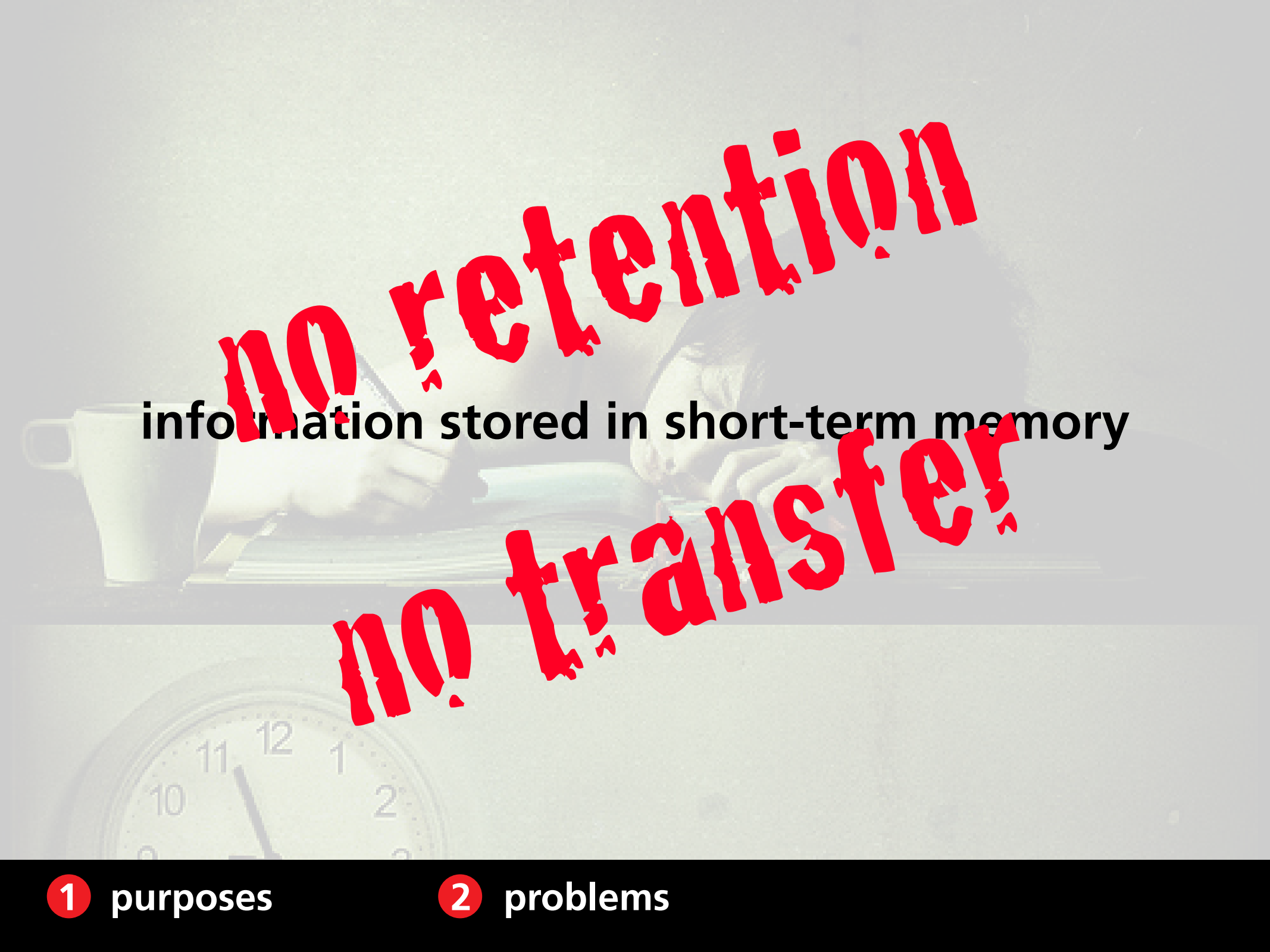
2 problems



information stored in short-term memory

1 purposes

2 problems



1 purposes 2 problems

grades: measure of standing relative to others

1 purposes

2 problems

grades: measure of standing relative to others

feedback: reflection on what has been learnt

assessment produces a conflict

1 purposes

2 problems

assessment produces a conflict

coach or judge?

1 purposes

2 problems

conflict resolved by:

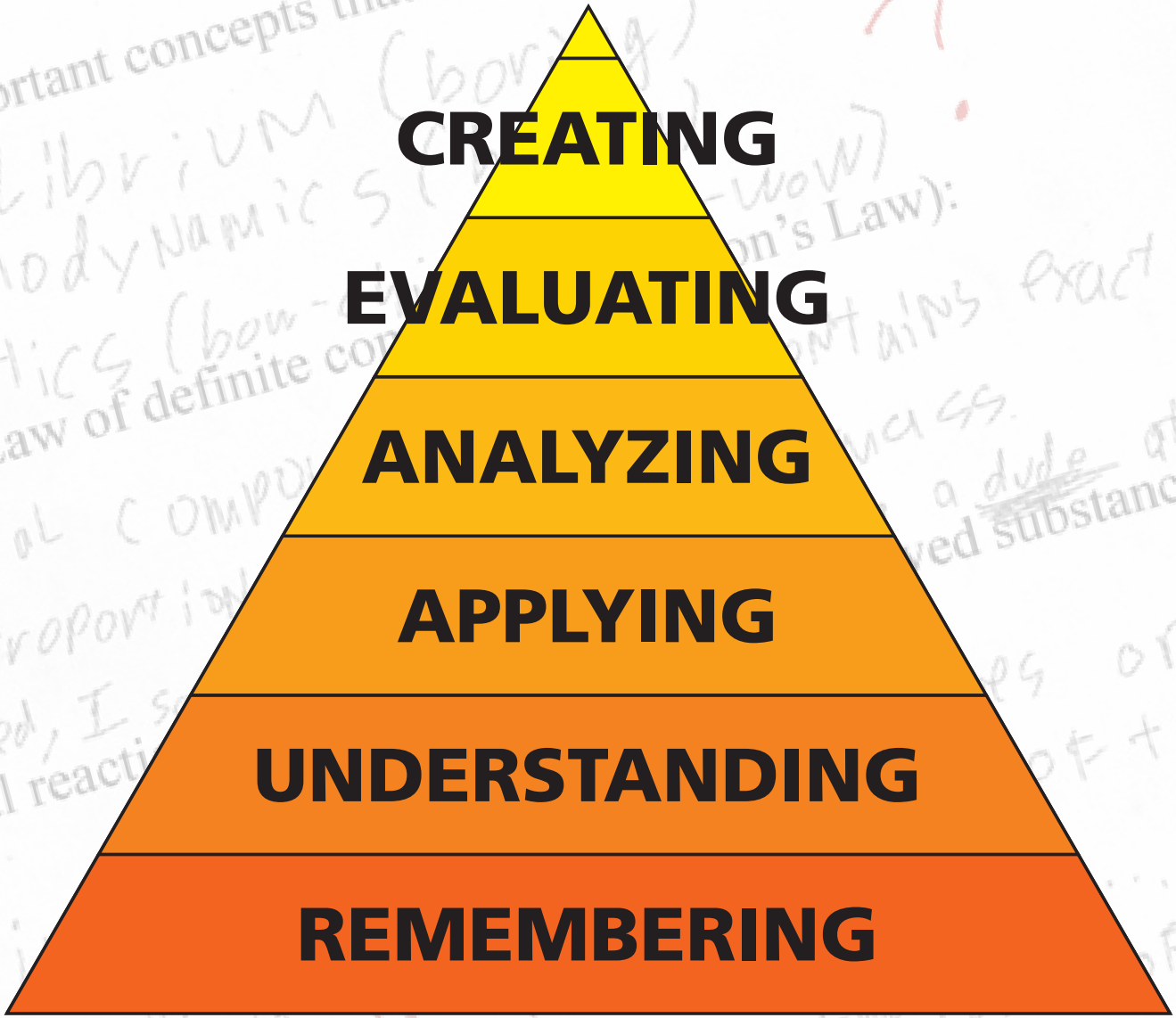
objectivity (fairness, reliability)

1 purposes 2 problems

... but ...

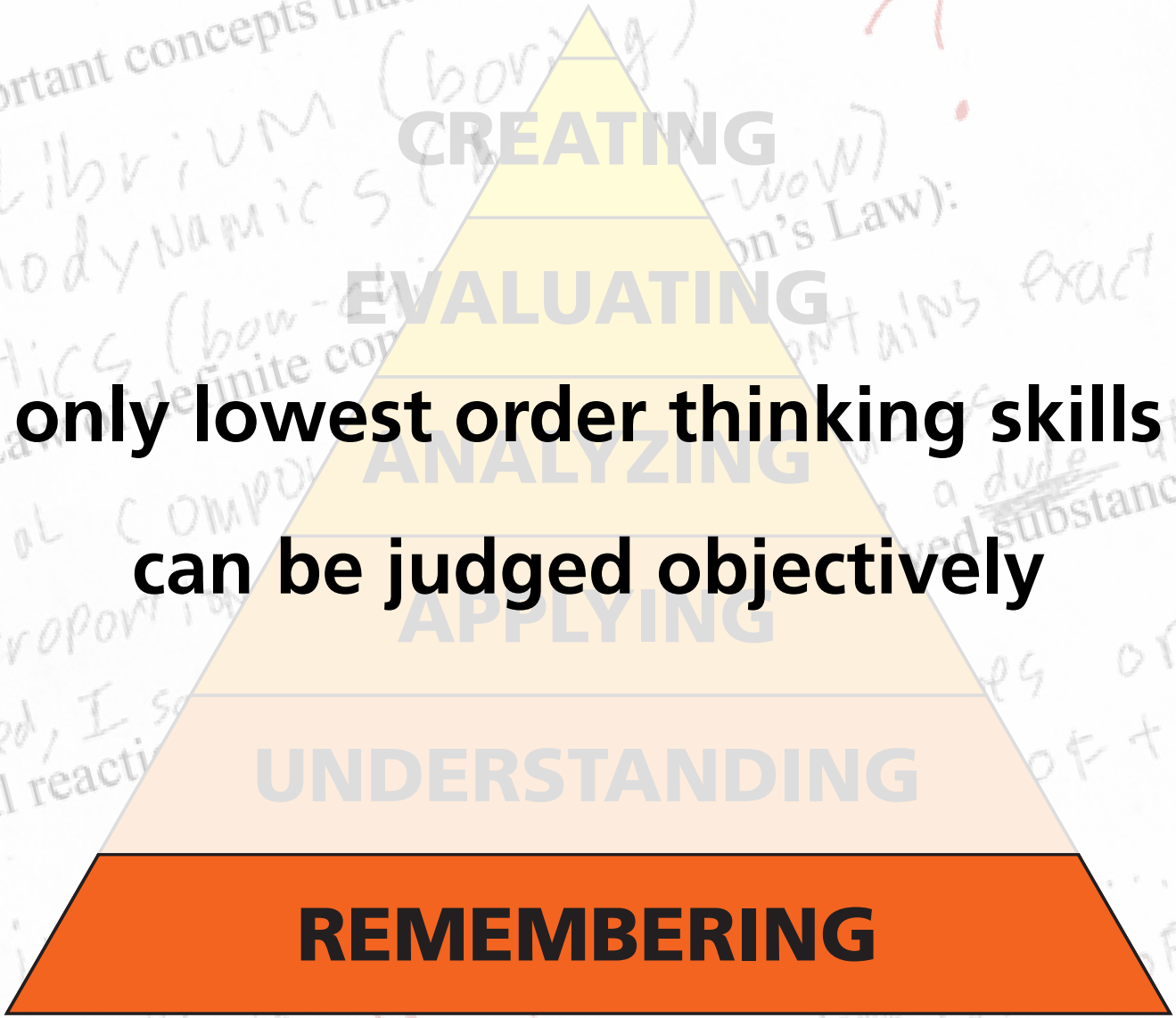
1 purposes

2 problems



1 purposes

2 problems



only lowest order thinking skills

can be judged objectively

1 purposes

2 problems

and then there is…

- grade inflation
- cheating

1 purposes

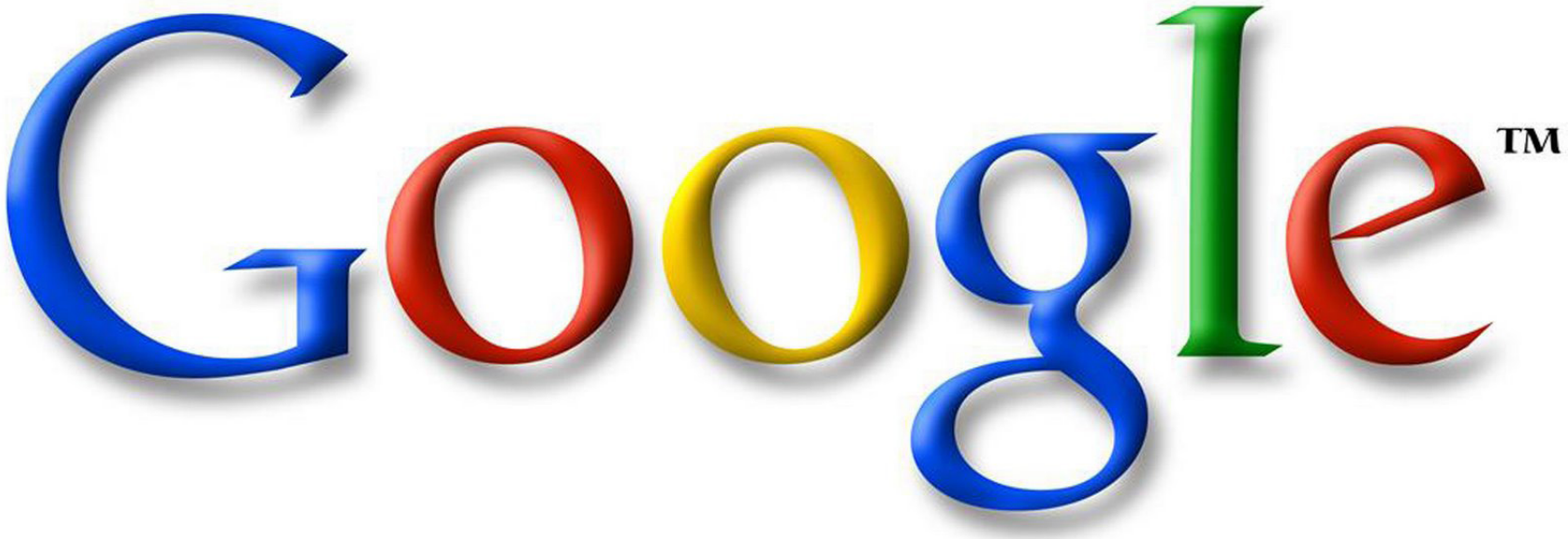
2 problems

3 improvements

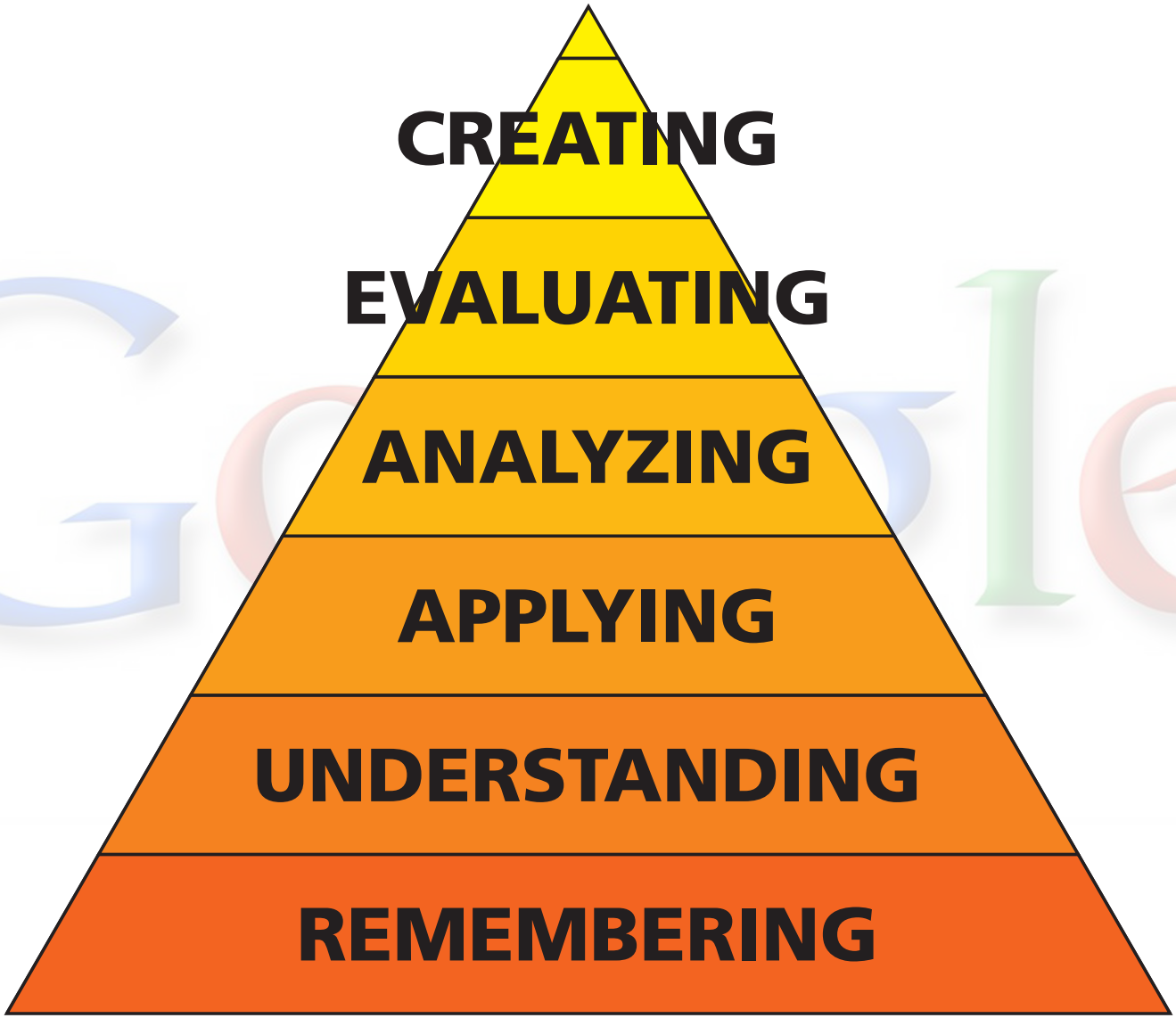
mimic real life

open-book exam

1. purposes
2. problems
3. improvements

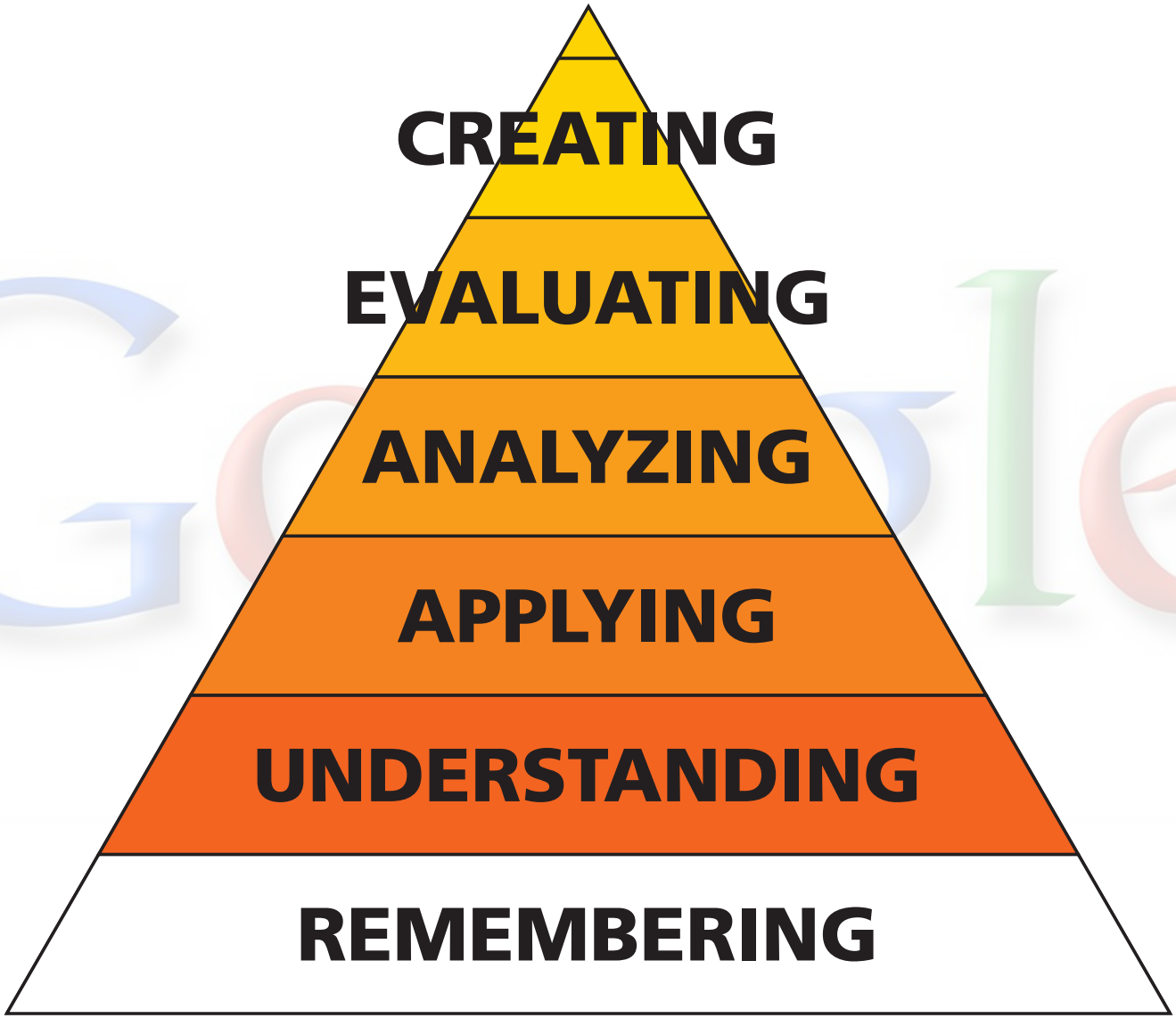


1 purposes 2 problems 3 improvements



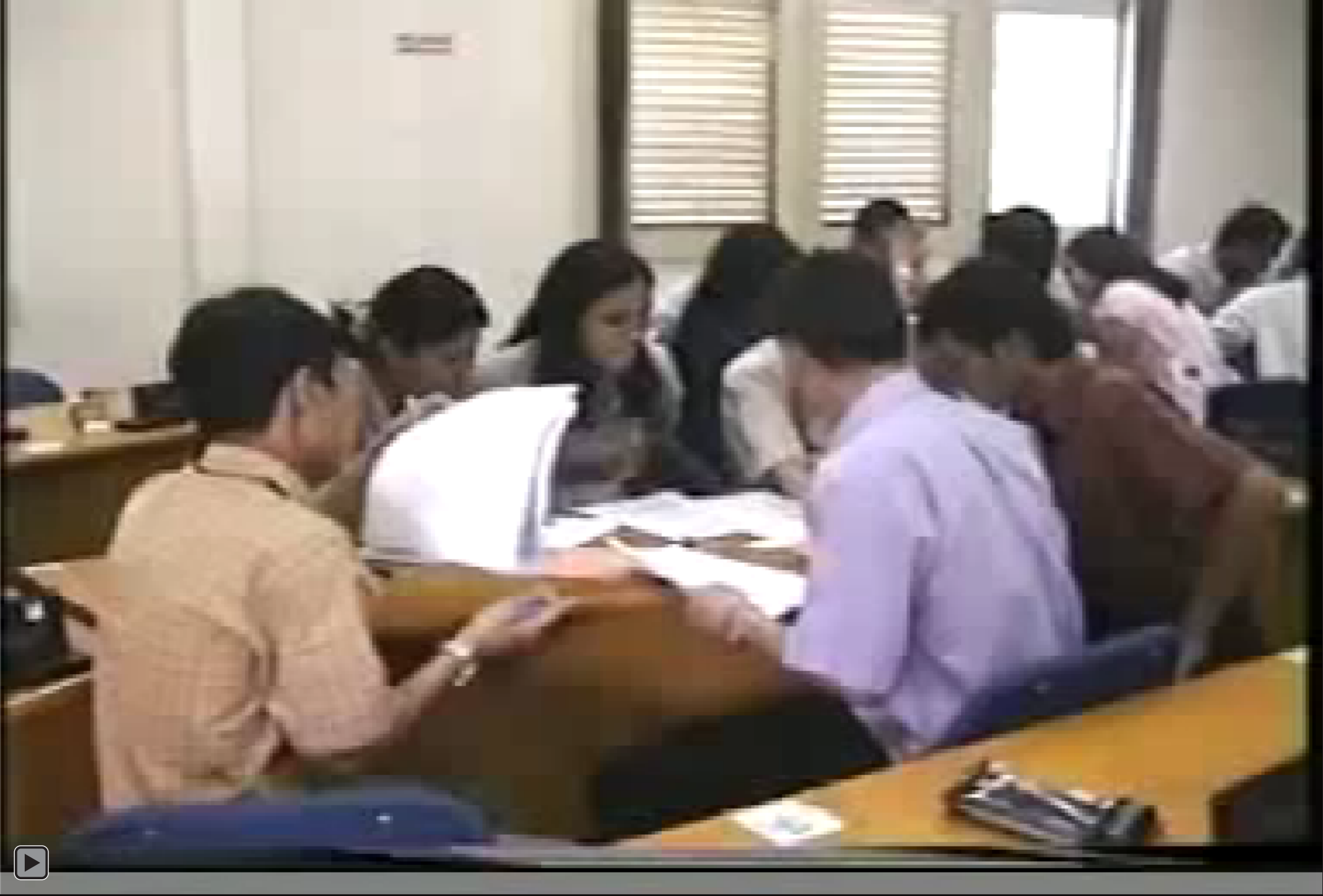
1 purposes

2 problems



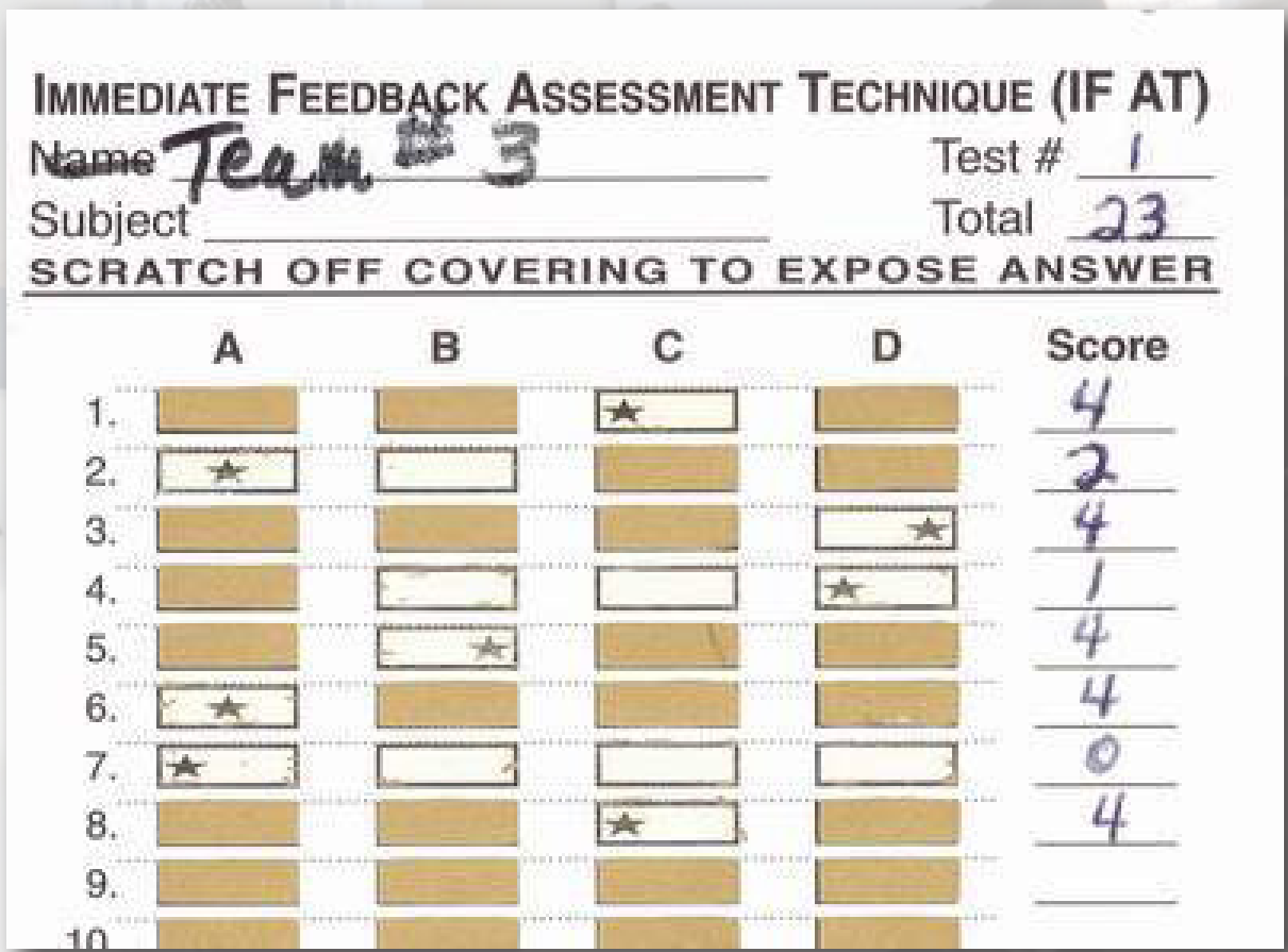
1 purposes

2 problems



1 what

2 how



IMMEDIATE FEEDBACK ASSESSMENT TECHNIQUE (IF AT)

Name Team # 3 Test # 1

Subject _____ Total 23

SCRATCH OFF COVERING TO EXPOSE ANSWER

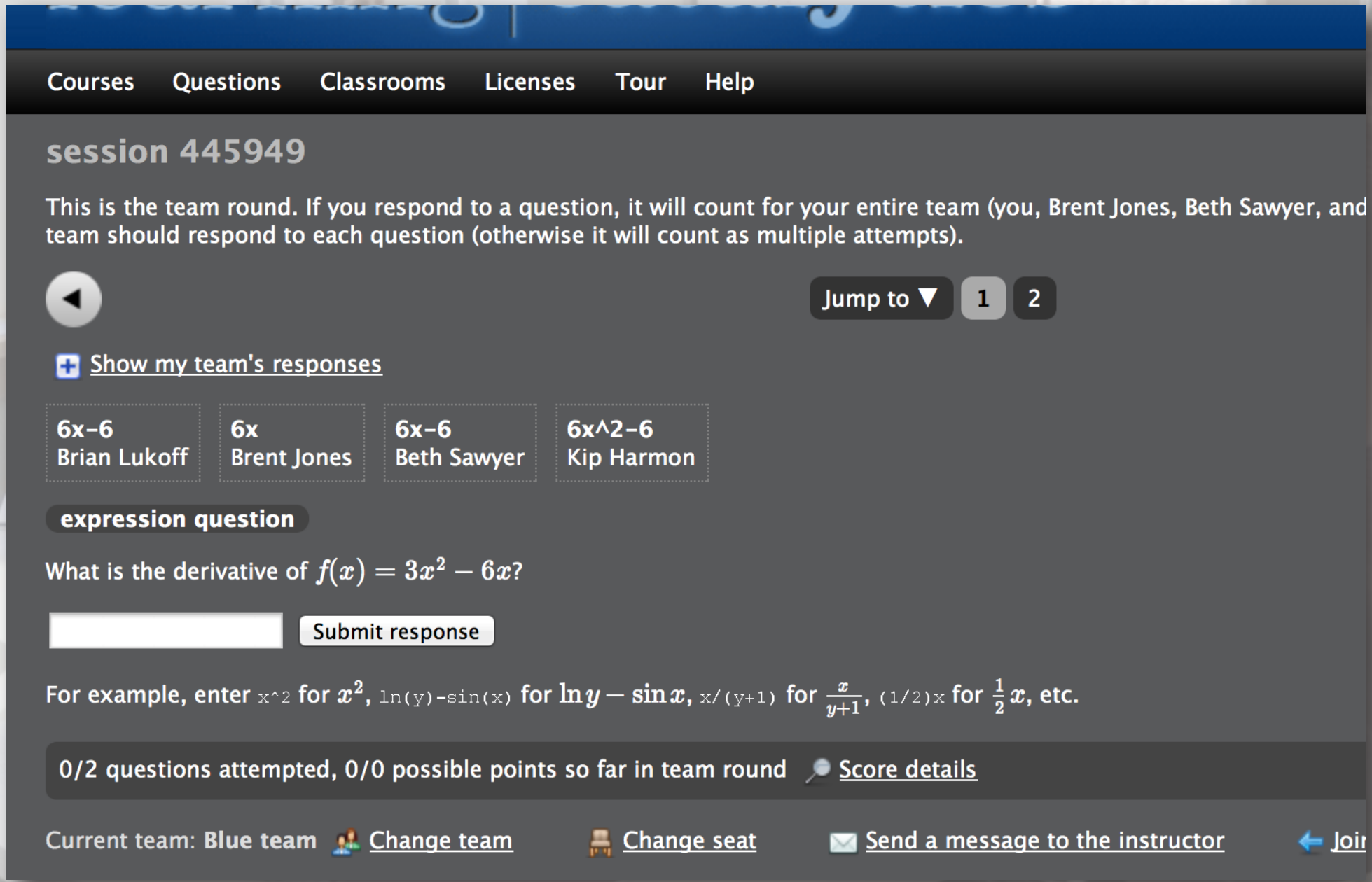
	A	B	C	D	Score
1.			★		4
2.	★				2
3.				★	4
4.				★	1
5.		★			4
6.	★				4
7.	★				0
8.			★		4
9.					
10.					

1 purposes 2 problems 3 improvements

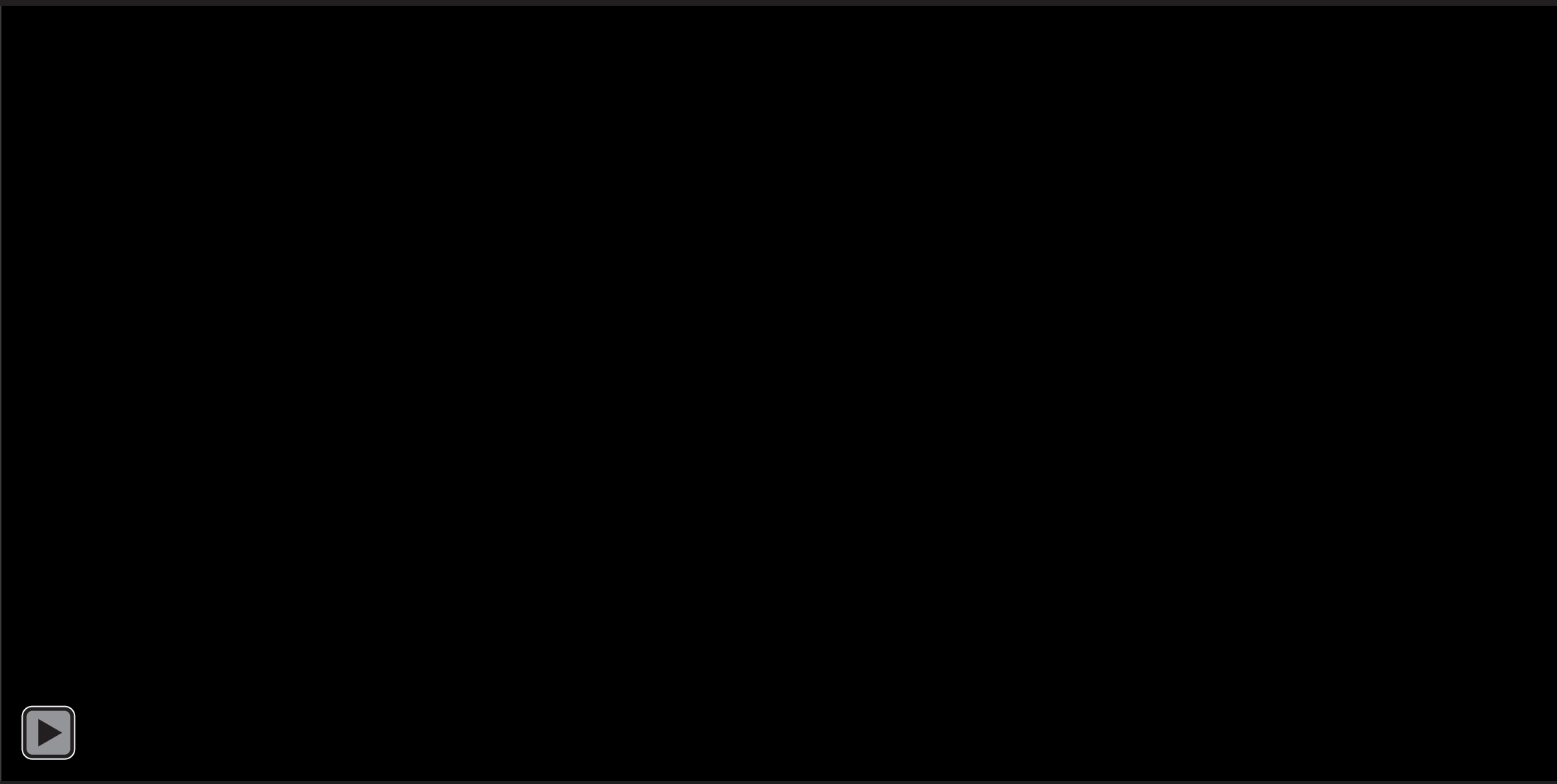
1 purposes

2 problems

3 improvements



1 purposes 2 problems 3 improvements

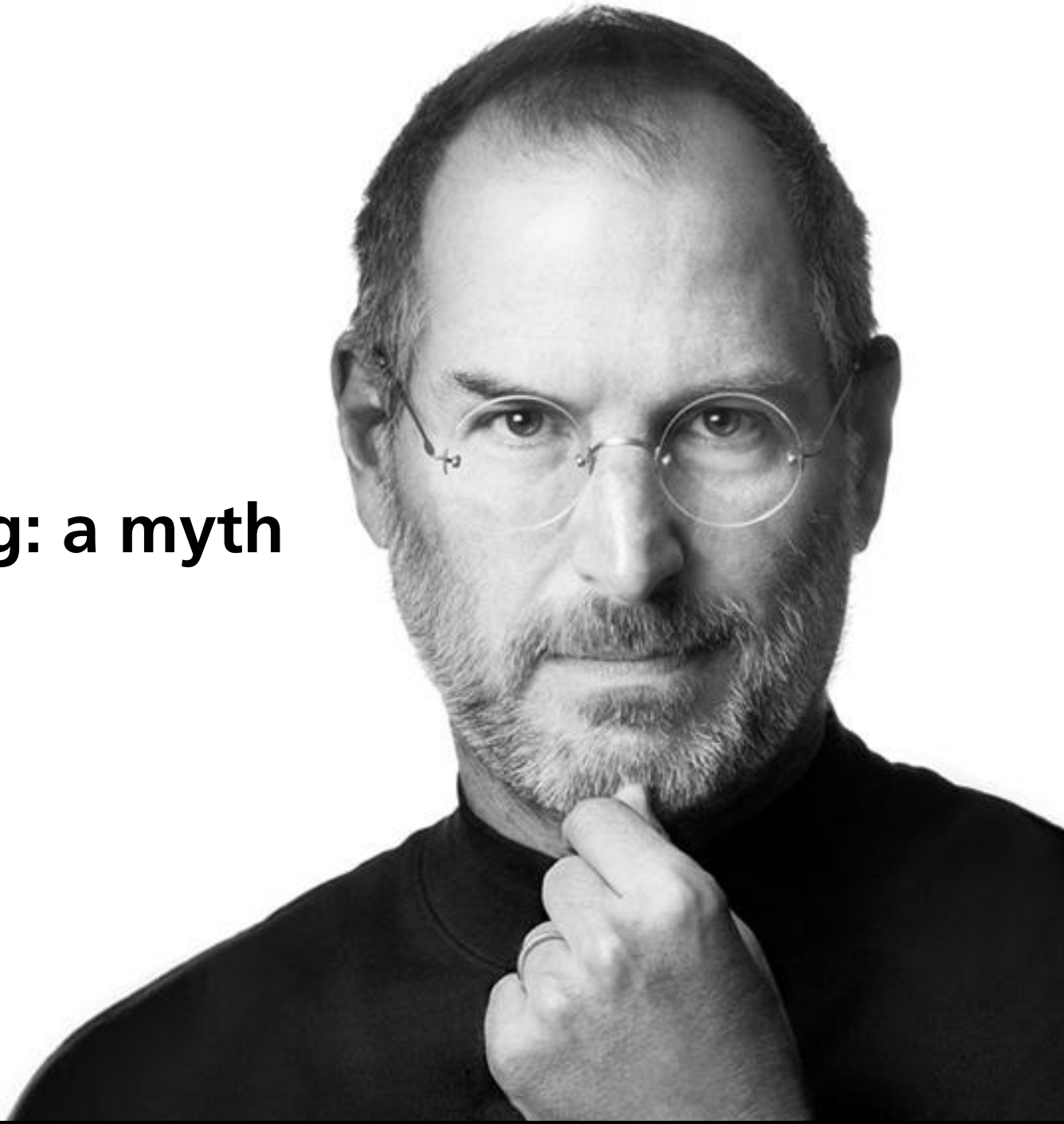


1 what

2 how

focus on feedback, not ranking

objective ranking: a myth

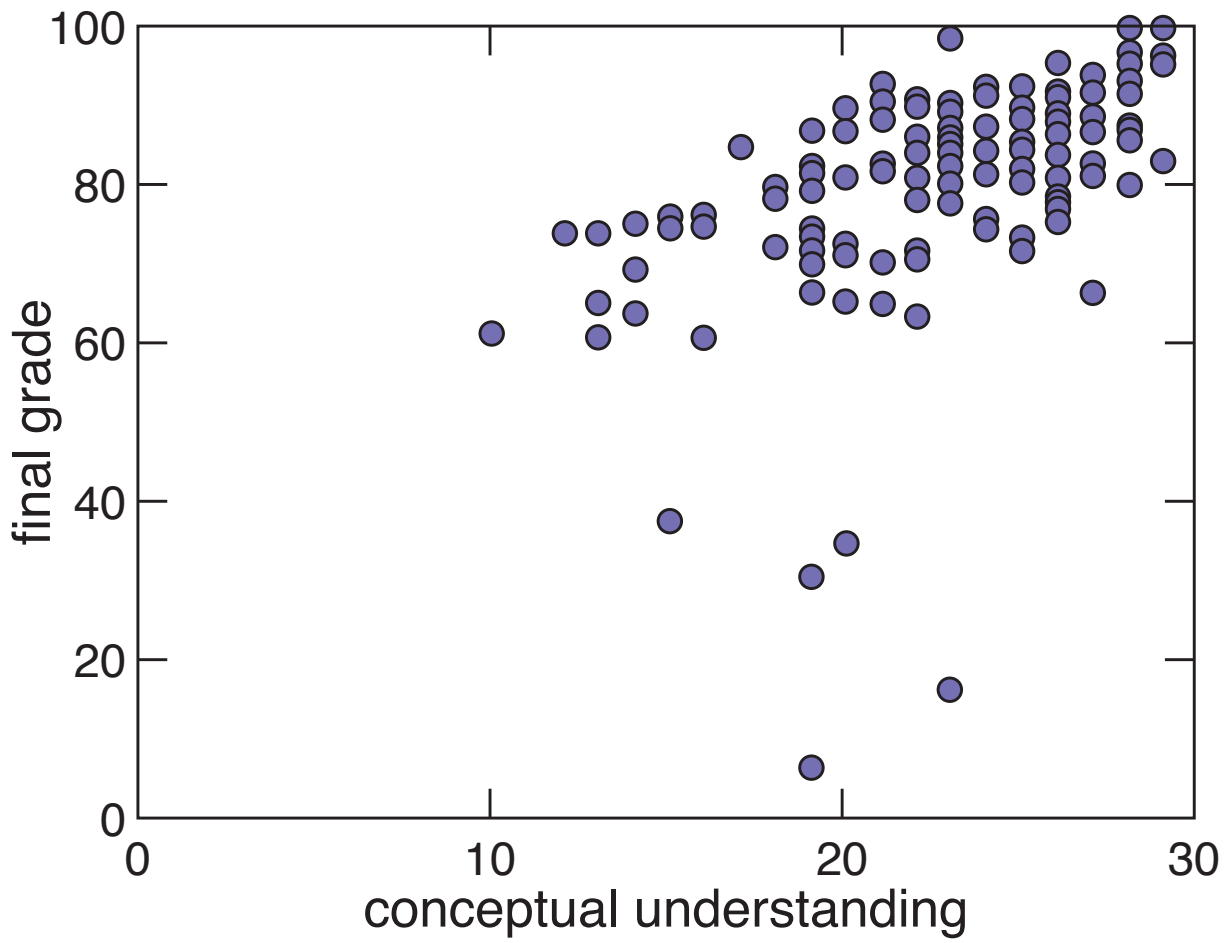


1 purposes

2 problems

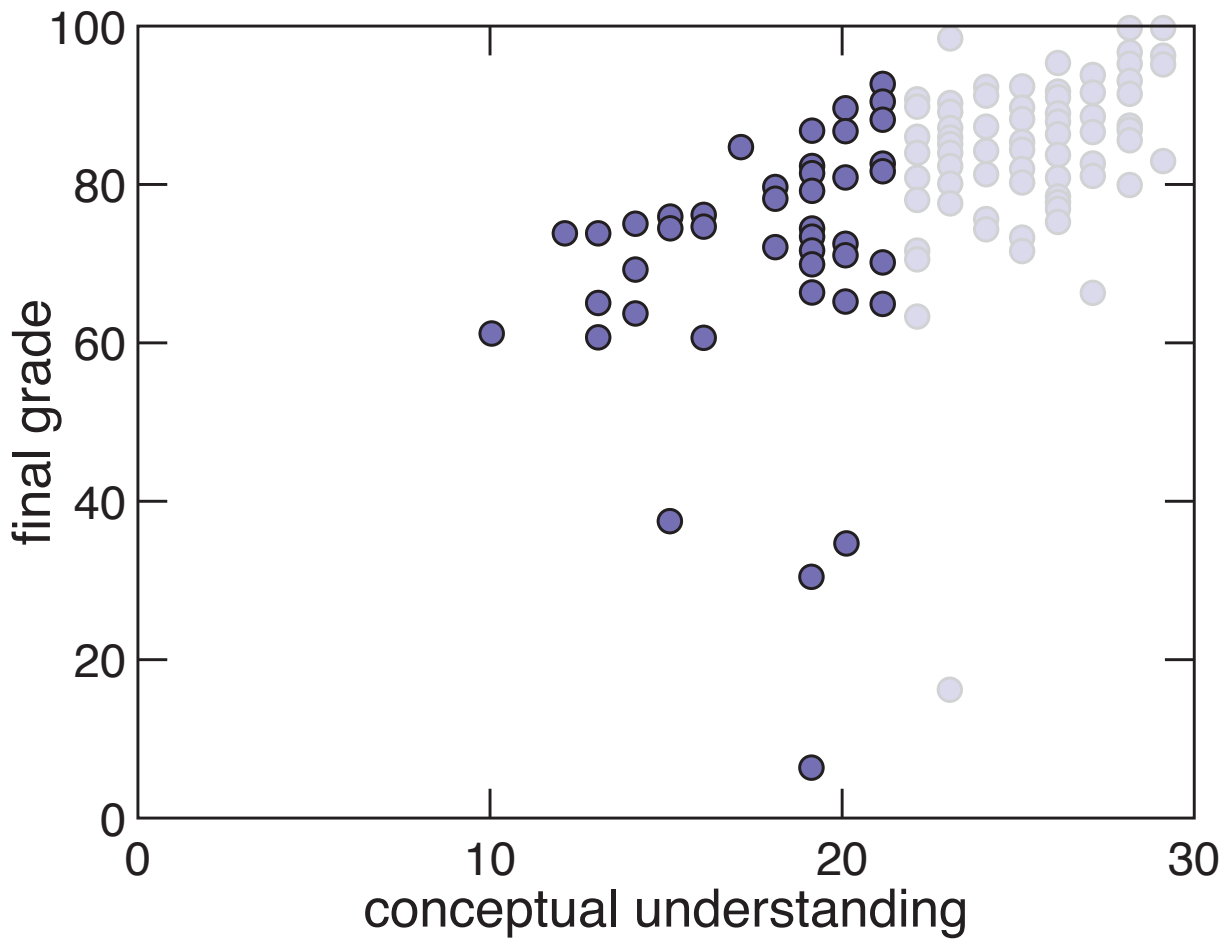
3 improvements

2 metrics, 2 results



1 purposes 2 problems 3 improvements

Aristotelian thinkers

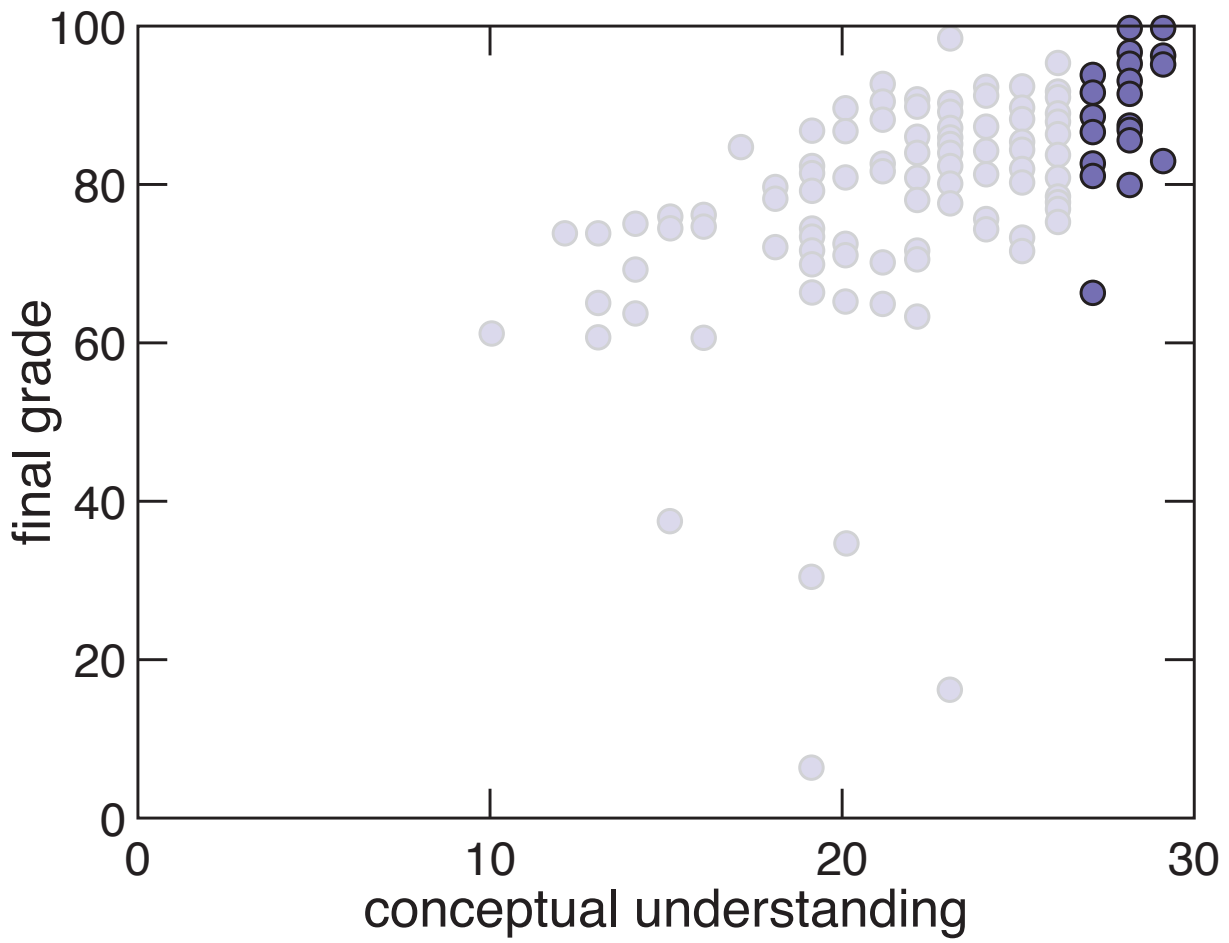


1 purposes

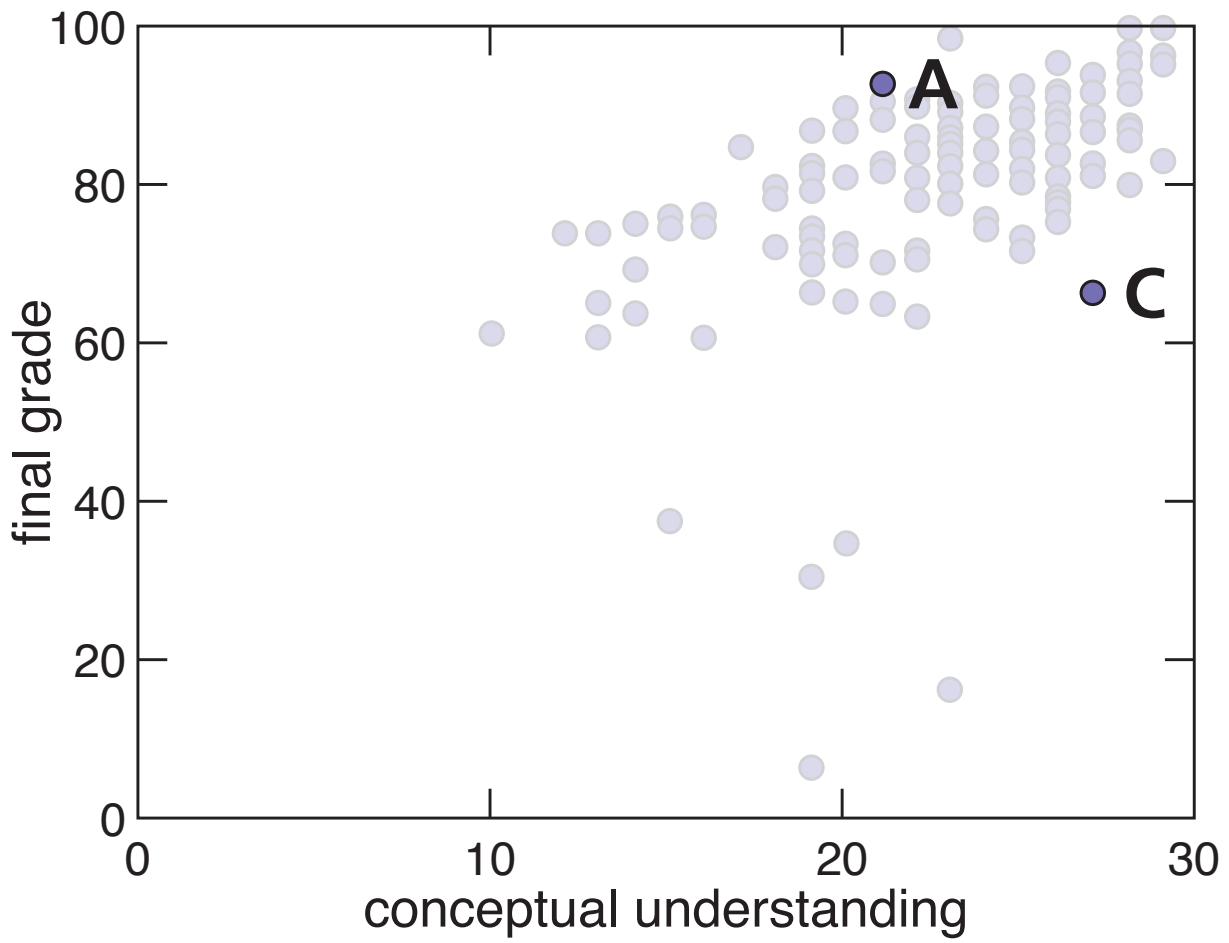
2 problems

3 improvements

top performers, broad grade distribution

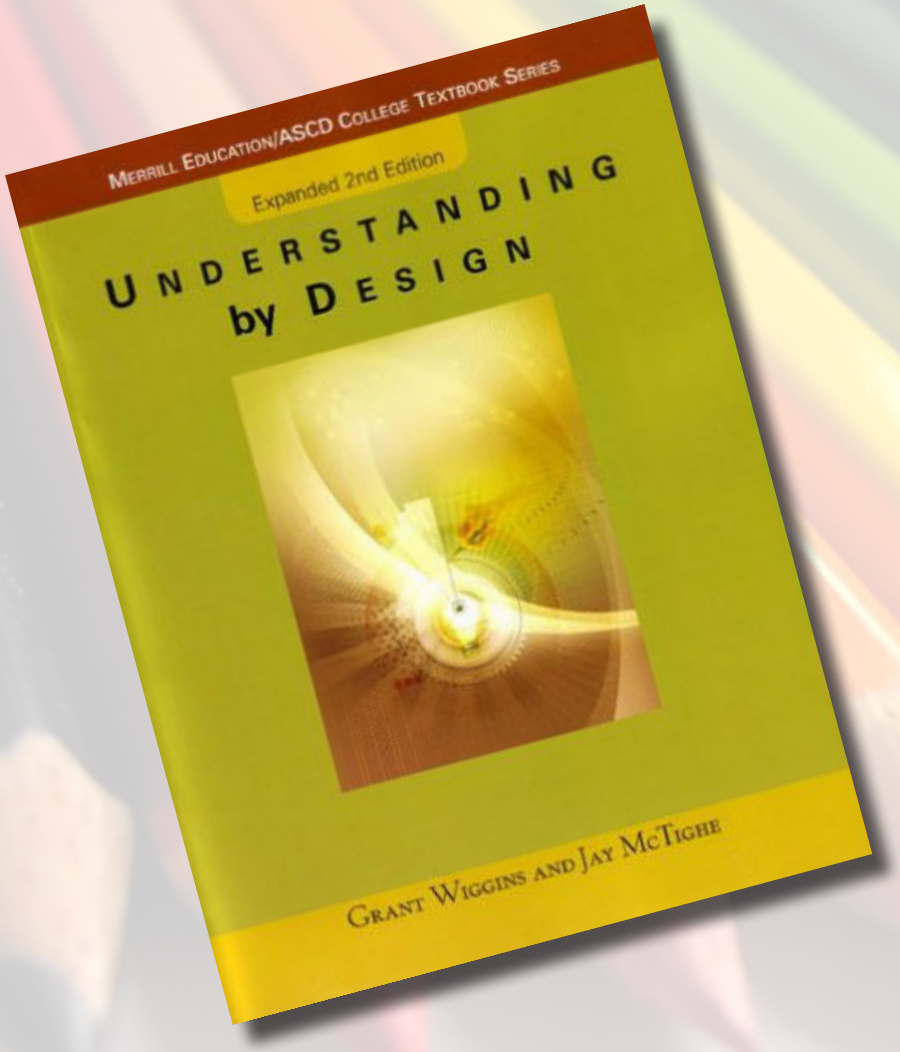


objectivity or injustice?



1 purposes 2 problems 3 improvements

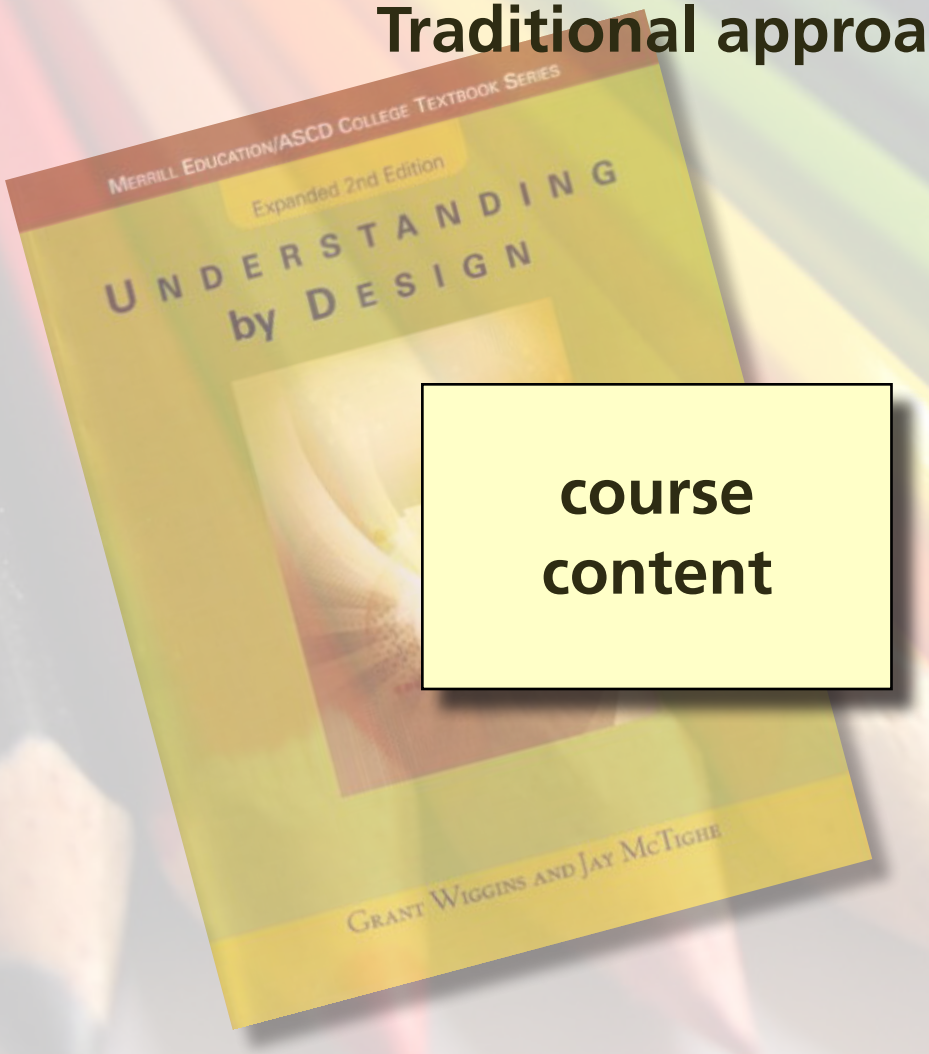
focus on skills, not content



Grant Wiggins and Jay McTighe, *Understanding by Design* (Prentice Hall, 2001)

1. purposes
2. problems
3. improvements

Traditional approach to course planning



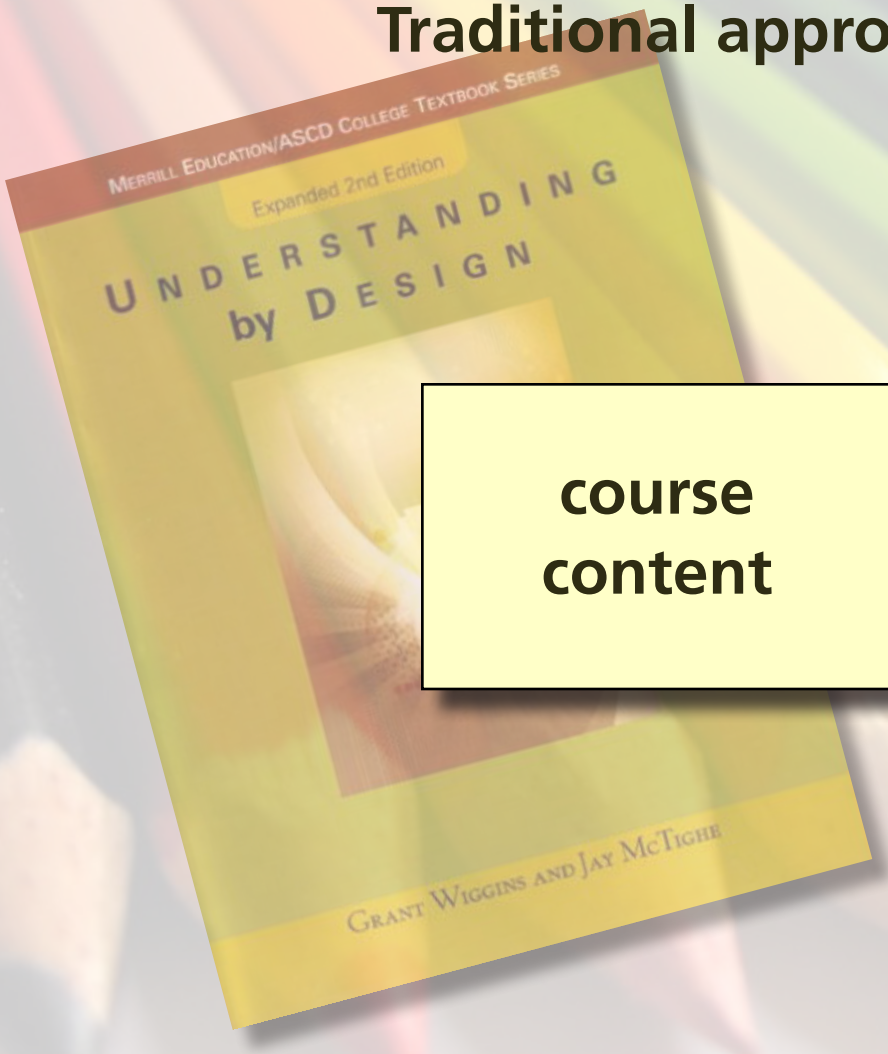
course content

1 purposes

2 problems

3 improvements

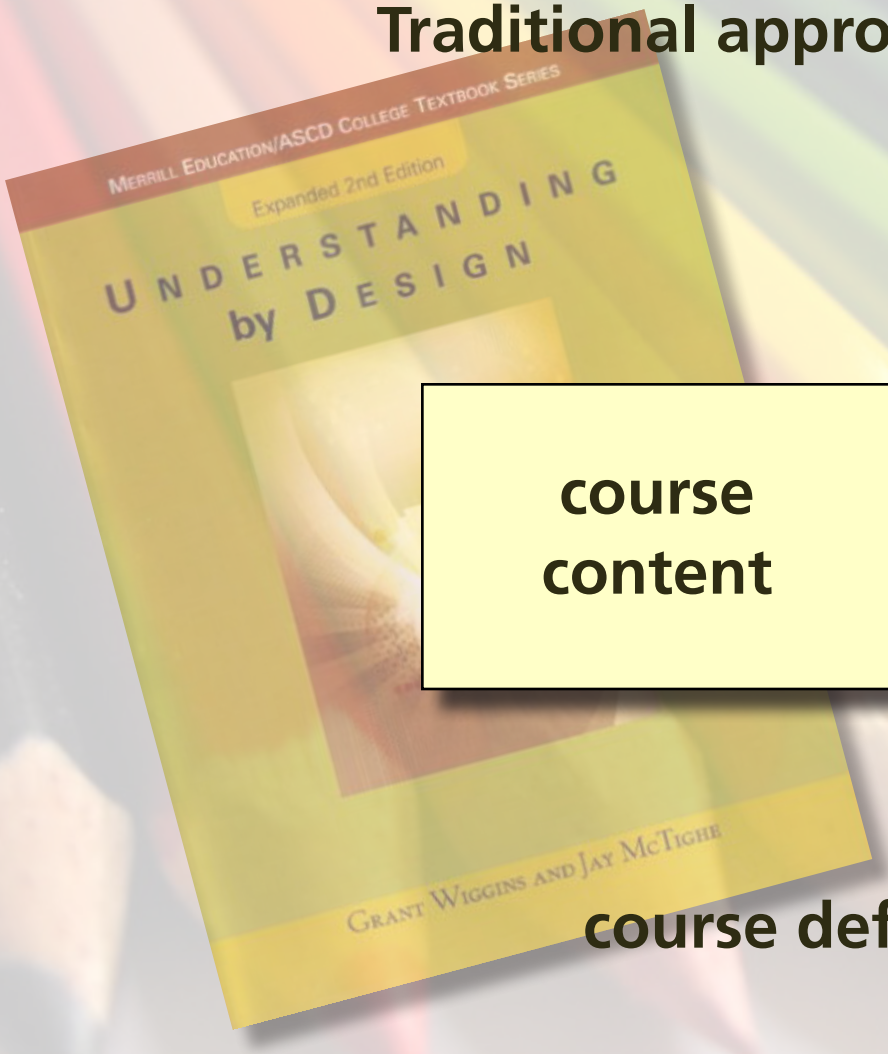
Traditional approach to course planning



course content → assessment

1. purposes
2. problems
3. improvements

Traditional approach to course planning

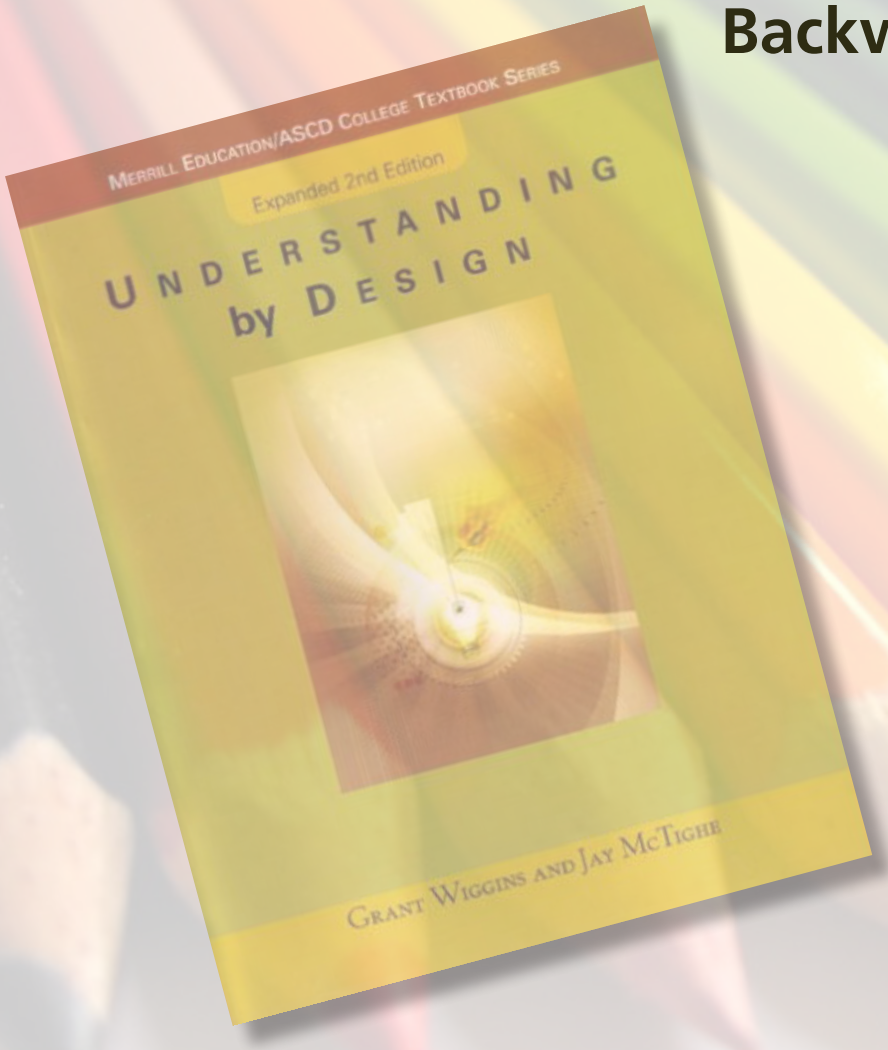


course content → assessment

course defined by content

1 purposes 2 problems 3 improvements

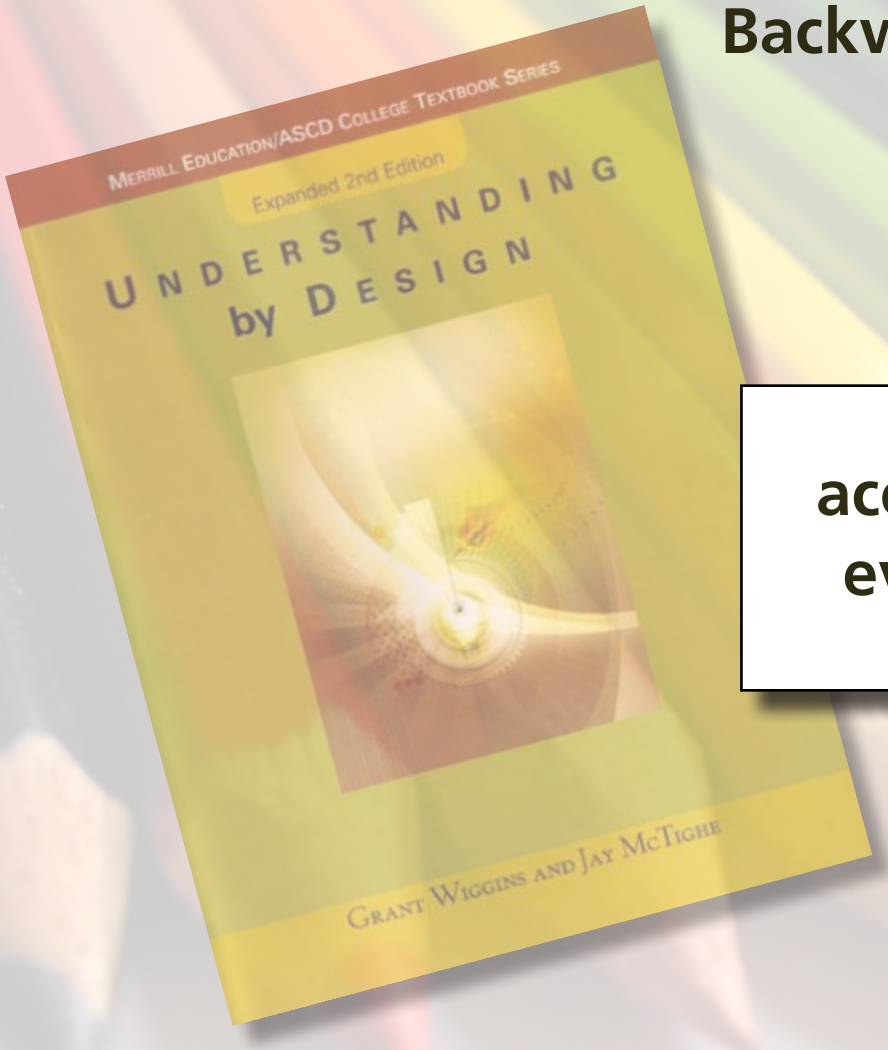
Backward design



desired outcomes

1. purposes
2. problems
3. improvements

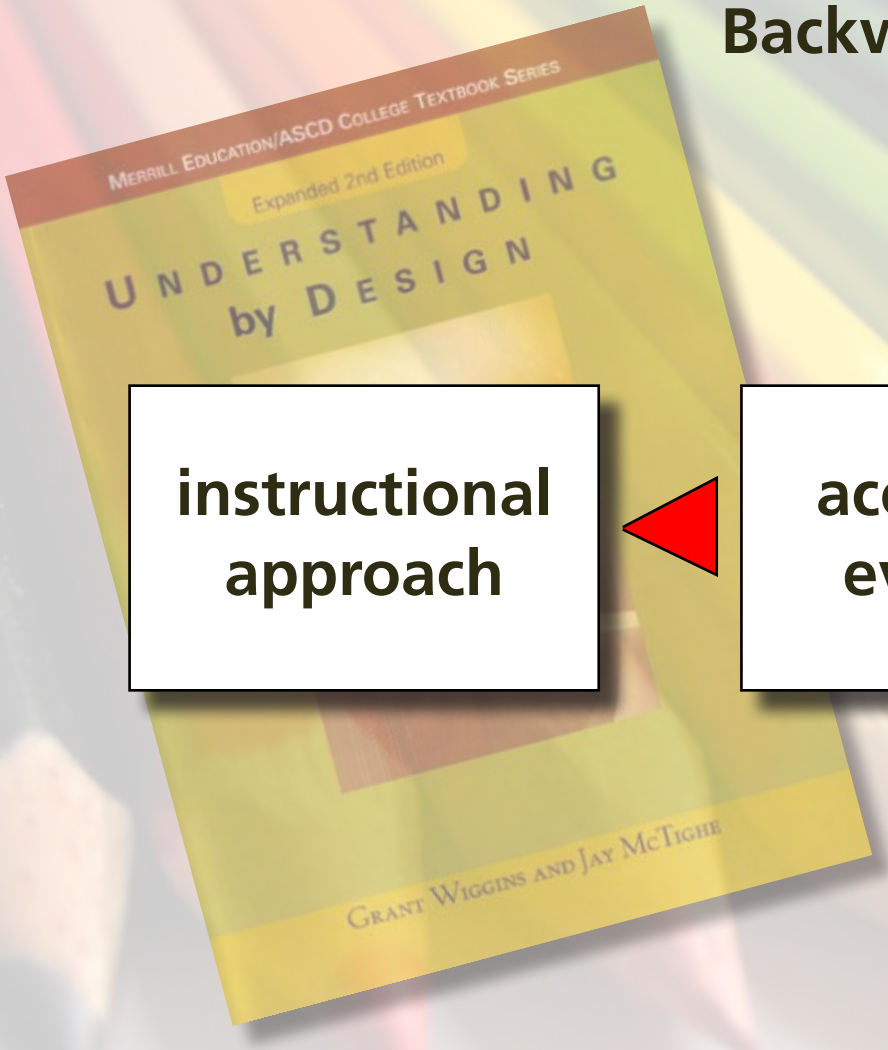
Backward design



acceptable evidence ◀ **desired outcomes**

1. purposes
2. problems
3. improvements

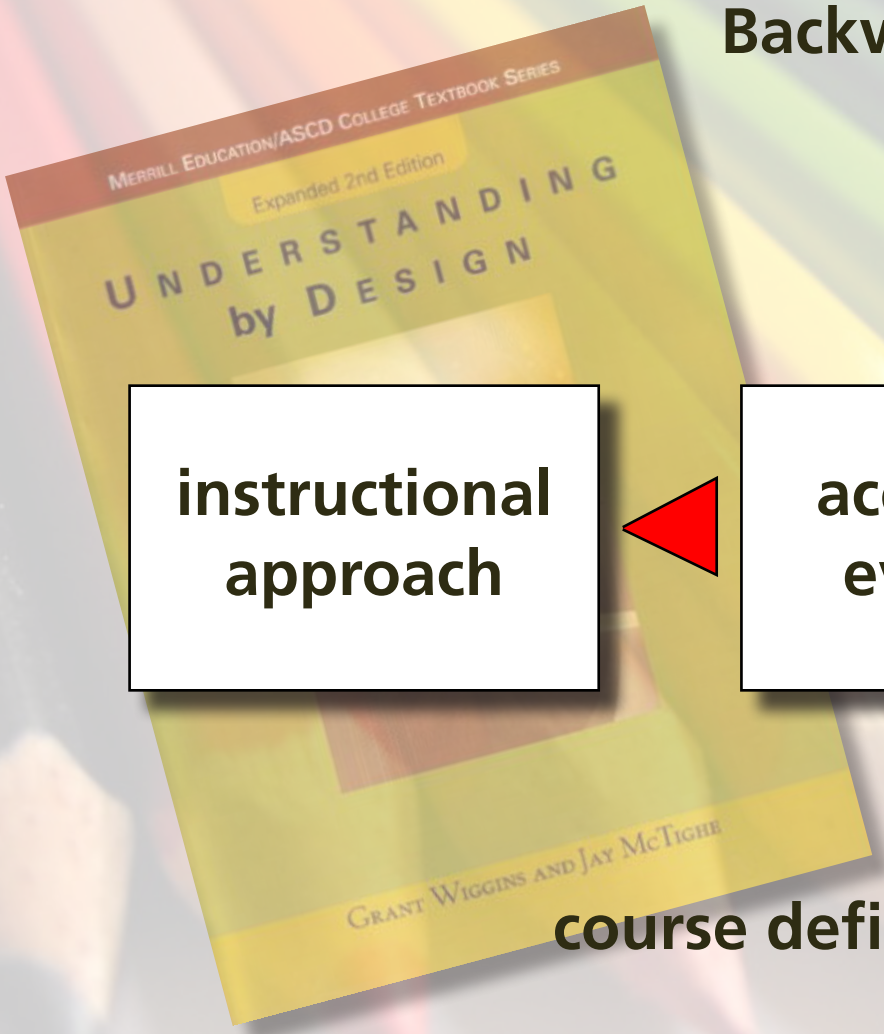
Backward design



instructional approach ← **acceptable evidence** ← **desired outcomes**

1. purposes
2. problems
3. improvements

Backward design



instructional approach ← **acceptable evidence** ← **desired outcomes**

course defined by outcomes

1. purposes
2. problems
3. improvements

resolve coach/judge conflict

use external evaluators

1 purposes 2 problems 3 improvements

peer- and self-assessment

1. purposes
2. problems
3. improvements

Calibrated Peer Review

Step 1: assignment & rubric

cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

Calibrated Peer Review

Rubric for Calibrated Peer Review

WRITING RUBRIC

		1 = needs improvement does not meet expectations entirely	**2 = satisfactory** meets expectations **(what you should aim for)**	**3 = admirable** exceeds expectations **(rarely selected)**
Structure	Title	Wordy, long, unimaginative, or inappropriate title	Basic title	Catchy title drawing audience into article
	Opening	Missing a "hook" or a lead in the first paragraphs AND does not orient reader to subject	Hook or lead present OR first few paragraphs orient reader to subject	Compelling audience appropriate hook or lead present AND first few paragraphs orient lay reader to subject
	Paragraph length	Many paragraphs are long (6 or more sentences)	Some paragraphs are long (6 or more sentences), most are short (1-5 sentences)	All paragraphs are short (1-5 sentences)
	Organization	Lacks organization, no logical headings, no transitions between paragraphs	A few headings OR most paragraphs linked by transitions	Headings structure paper in organized, logical way AND paragraphs linked by transitions
	Closing	Does not end compellingly or with an important idea AND does not tie back to opening	Summary-like closing, but does not tie back to title or opening hook	Ends compellingly with an important idea or though provoking question AND ties back to title and opening hook
Content/Ideas	Scientific facts	Contains incorrect, misstated, irrelevant, or unnecessary facts	All facts are 100% correct, relevant, and necessary	Includes fact-checked expert and/or lay testimony (newspaper article only)
	Sources/evidence	Does not back up facts with proper, convincing, or interesting sources or evidence	Most, but not all, facts backed up with proper, convincing, or interesting sources or evidence	
	Creativity	Mostly predictable based on available material	Some originality apparent	Original presentation of material; uses the unexpected to capture attention
	Audience awareness	Material inappropriate OR not aimed at target audience; Contains unexplained scientific jargon, colloquialisms, or acronyms	Material appropriate and aimed at target audience AND mostly avoids scientific jargon, contains no colloquialisms or acronyms, and mostly uses clearly defined scientific terms	Material appropriate and aimed at target audience AND relates to practical/everyday concerns AND uses analogies or other techniques to relate unfamiliar content to familiar concepts; no jargon, colloquialisms, or acronyms

1 purposes 2 problems 3 improvements

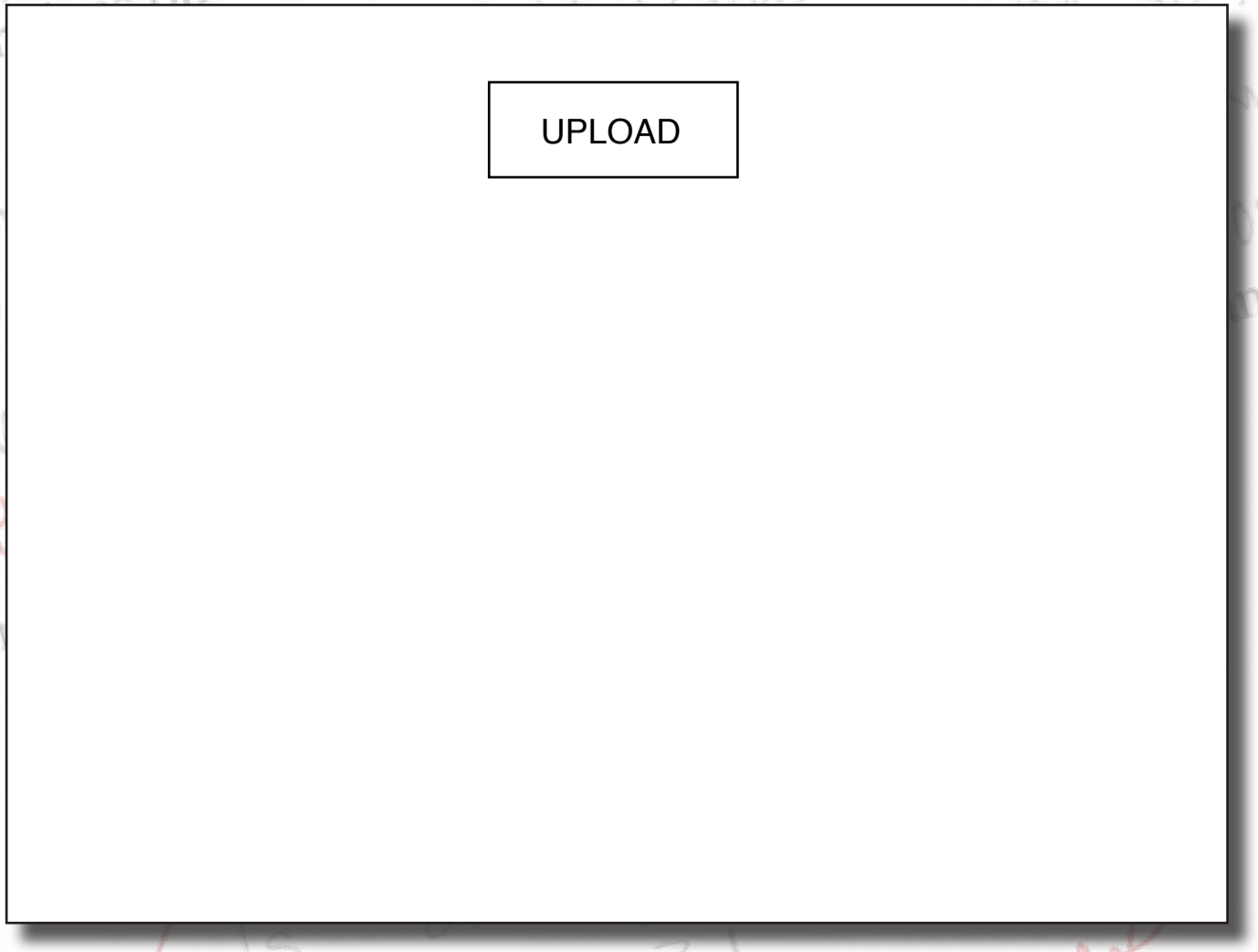
Calibrated Peer Review

Step 2: upload

Step 3: review

cpr.molsci.ucla.edu

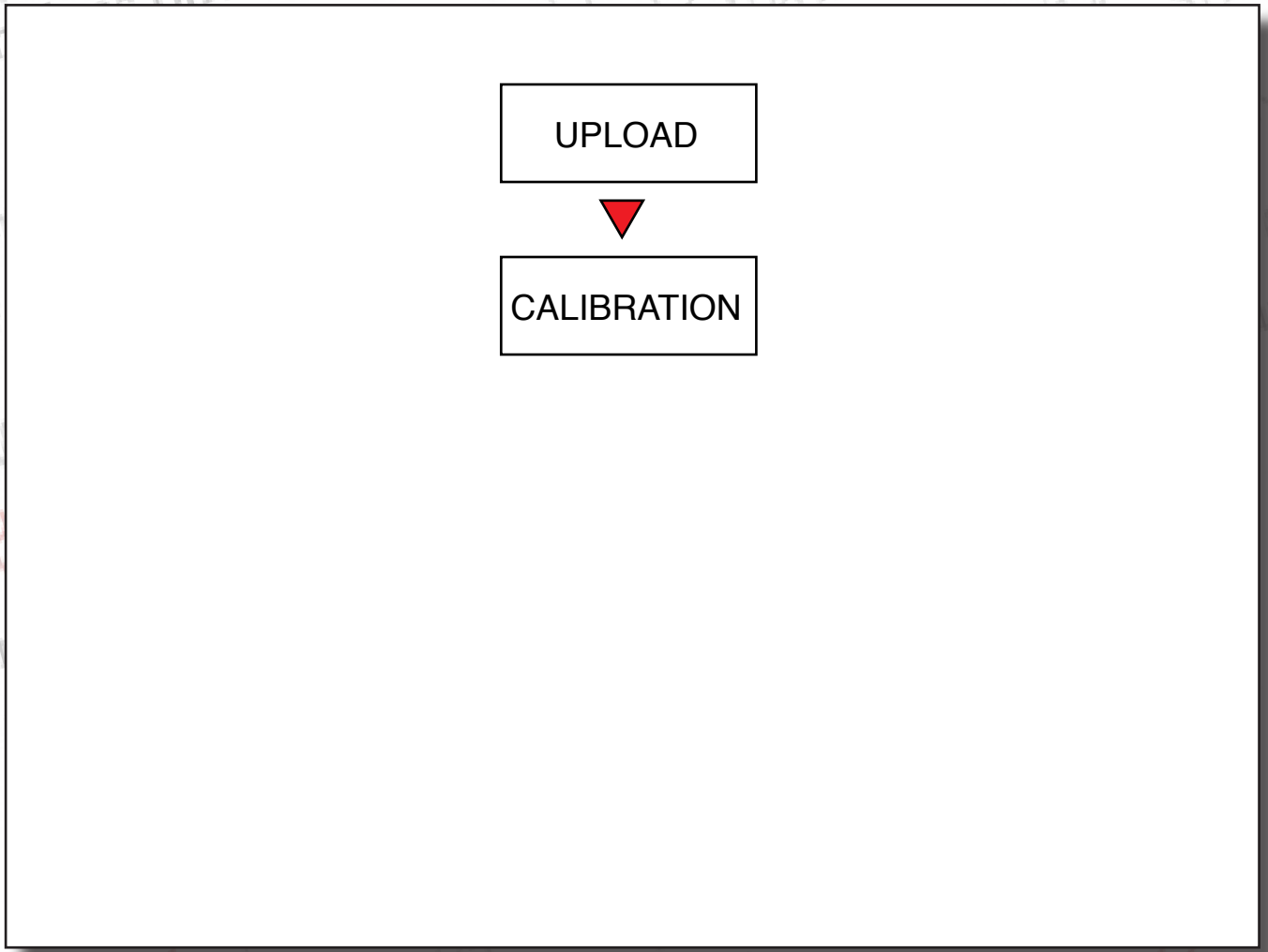
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

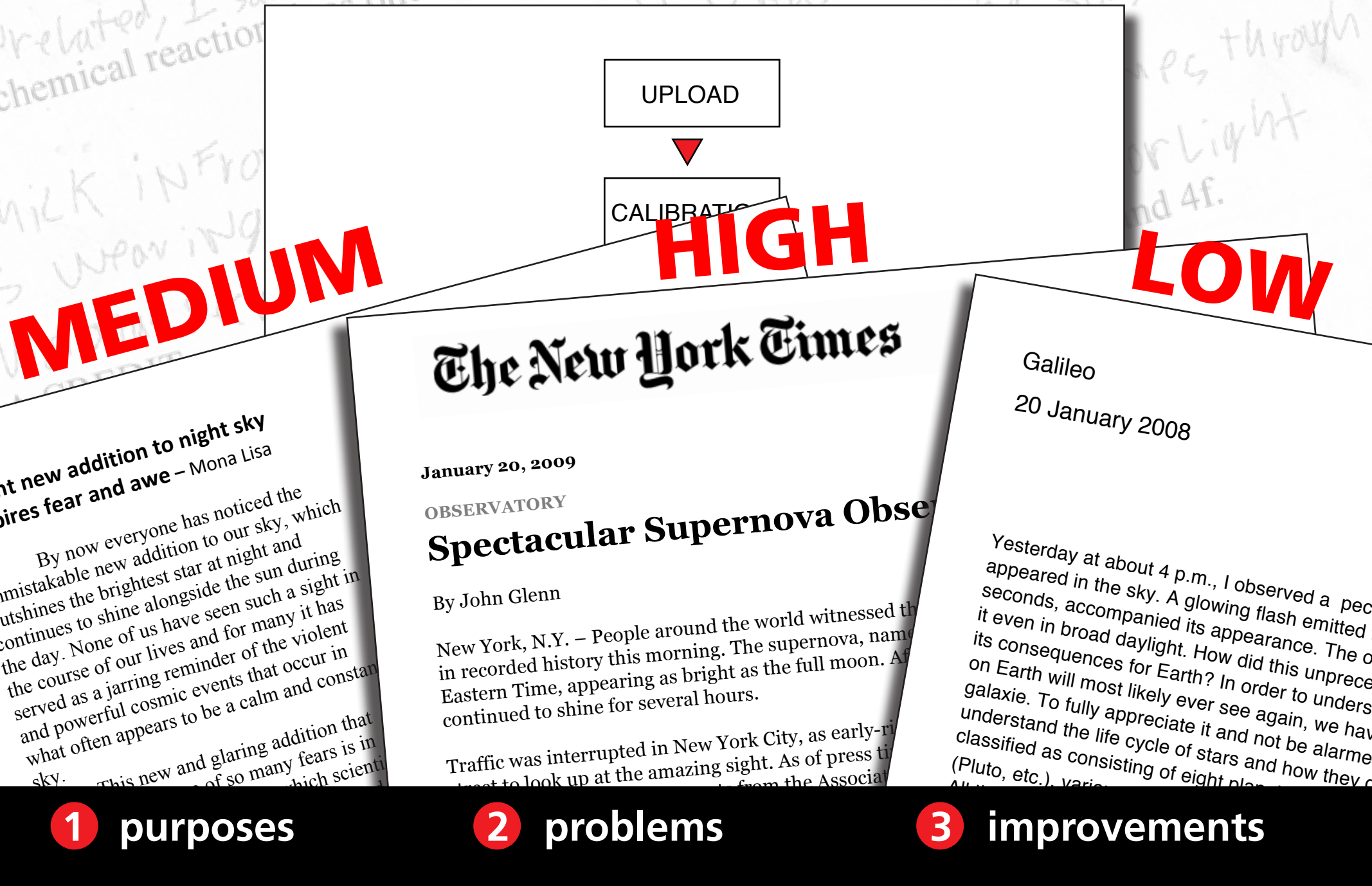
Calibrated Peer Review



cpr.molsci.ucla.edu

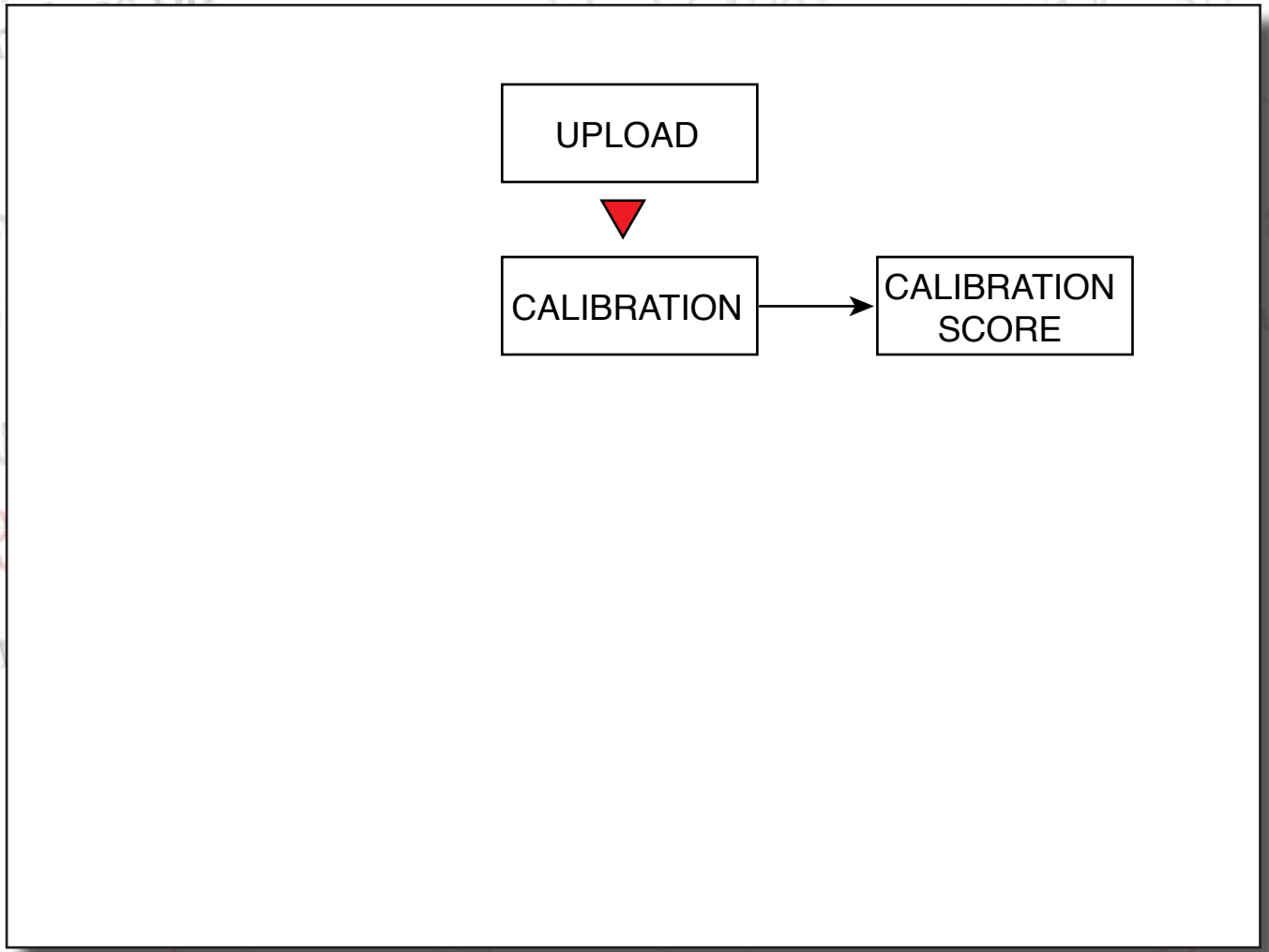
1 purposes 2 problems 3 improvements

Calibrated Peer Review



1 purposes 2 problems 3 improvements

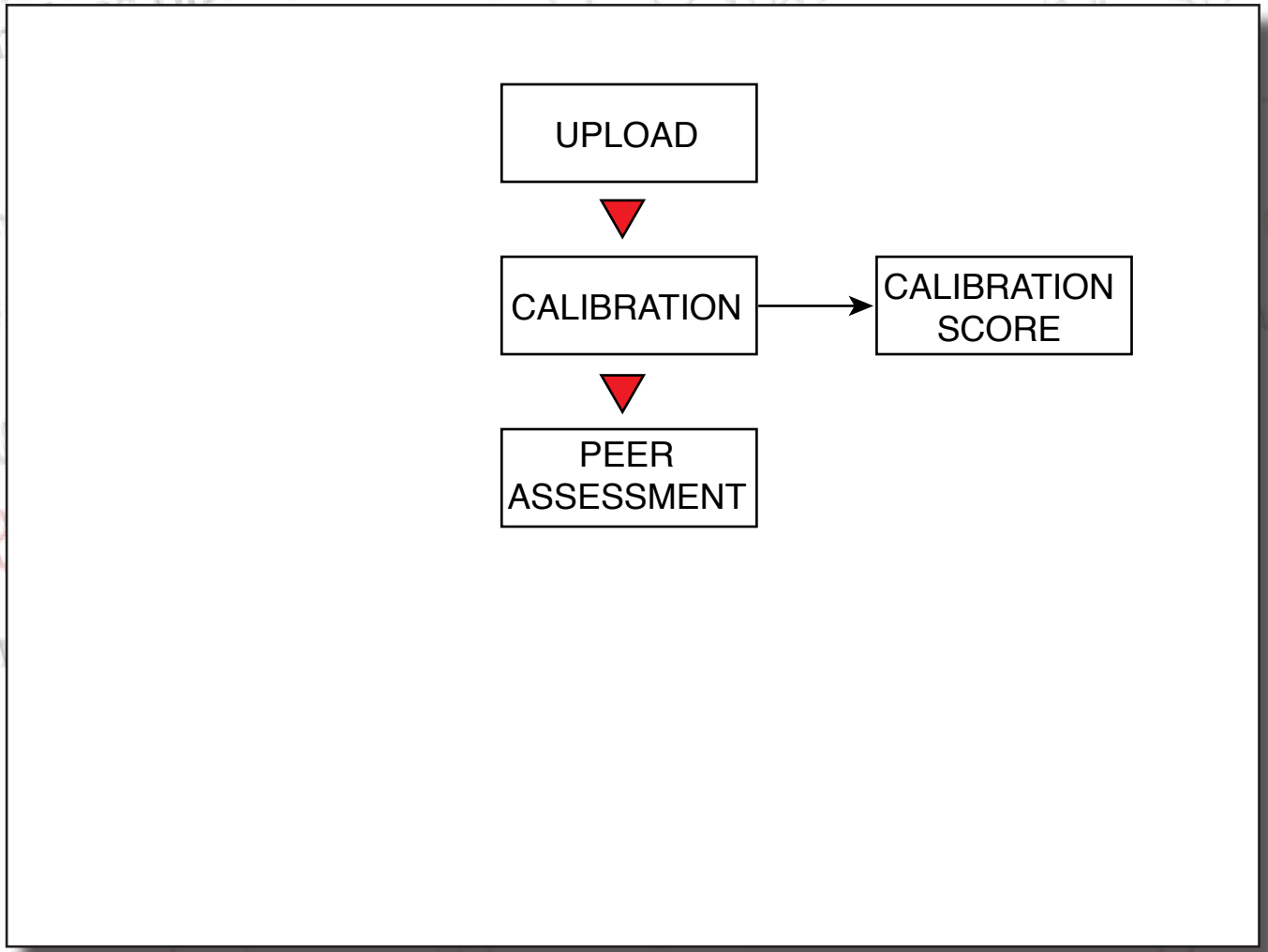
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

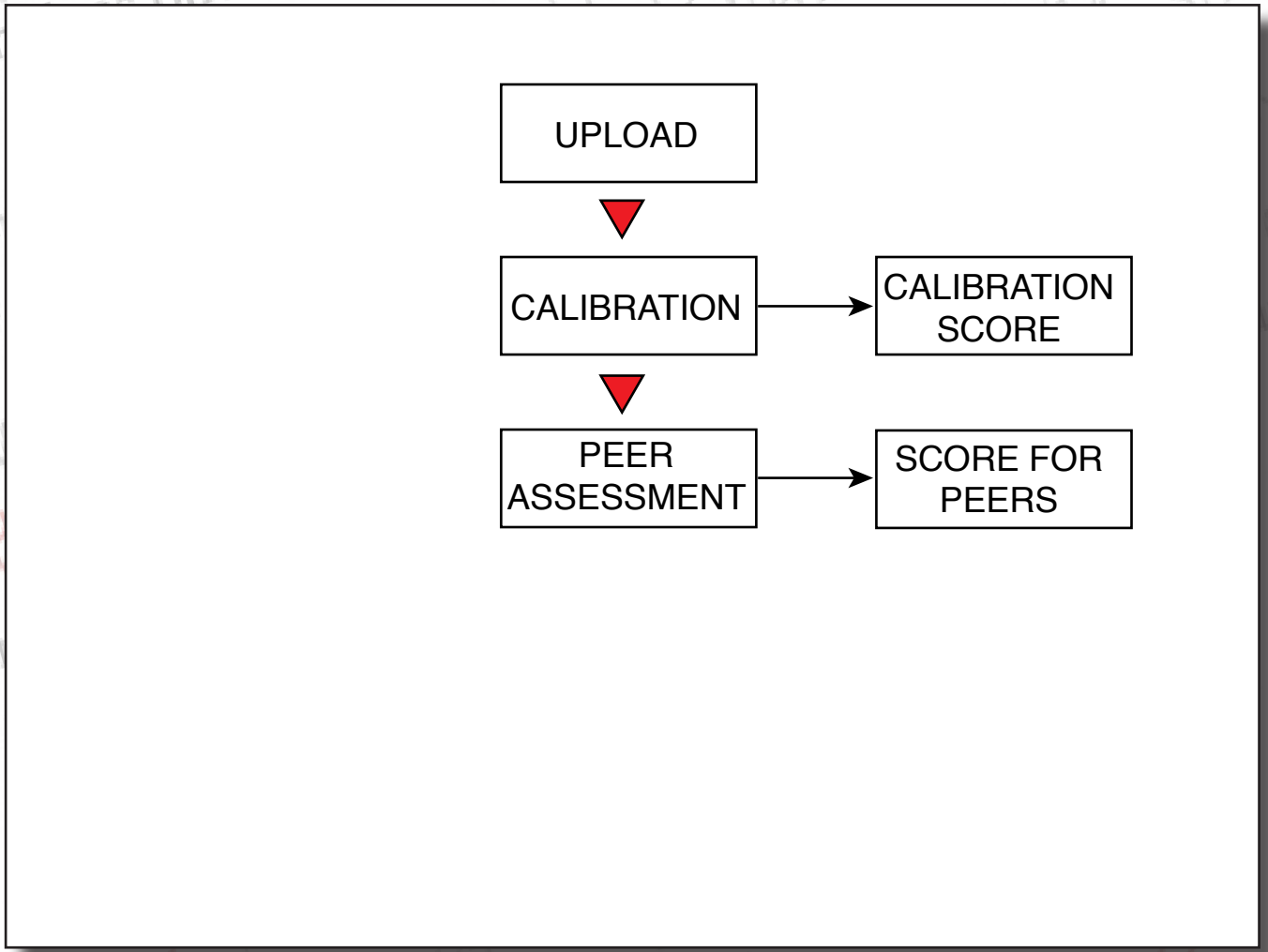
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

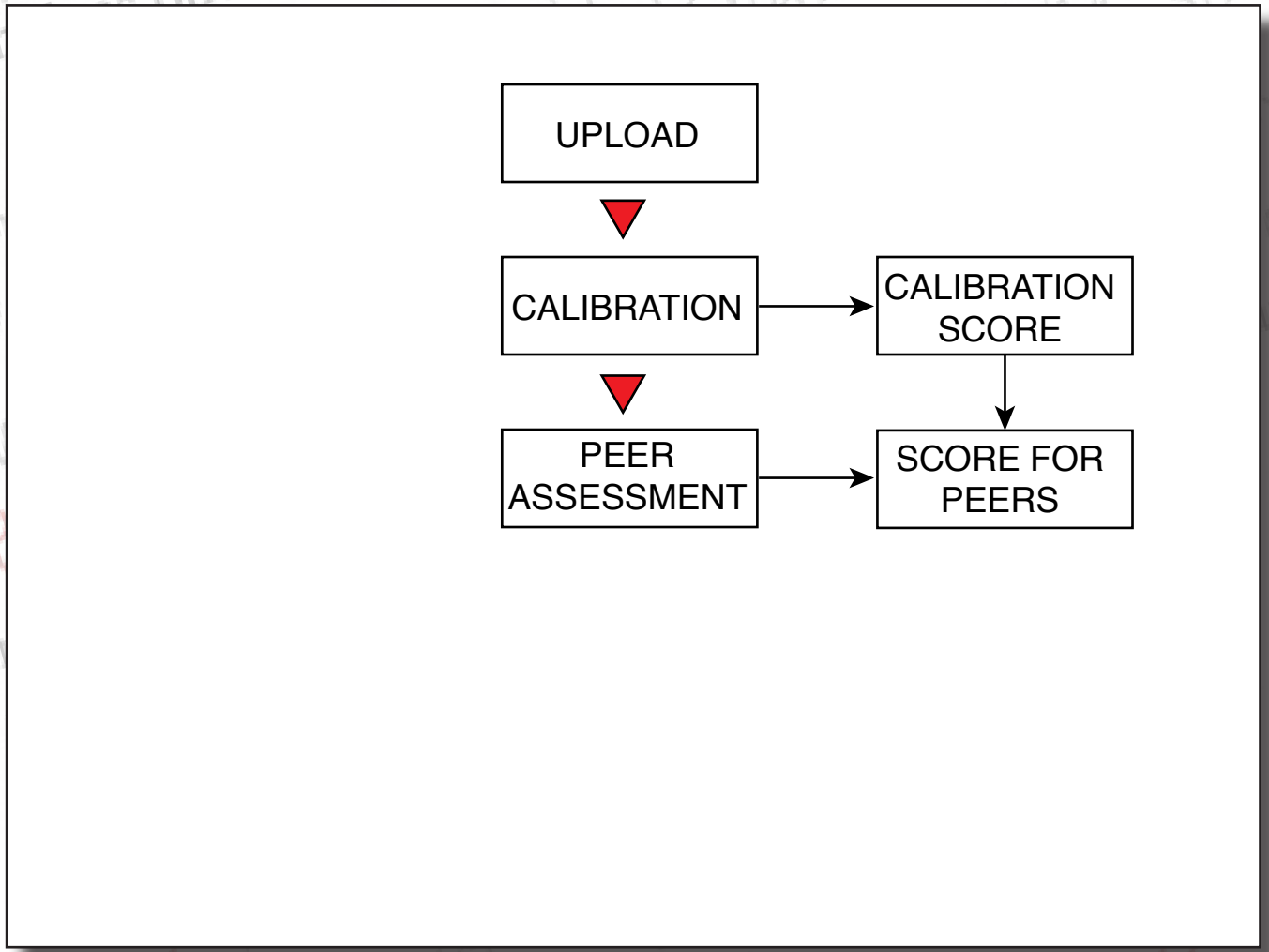
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

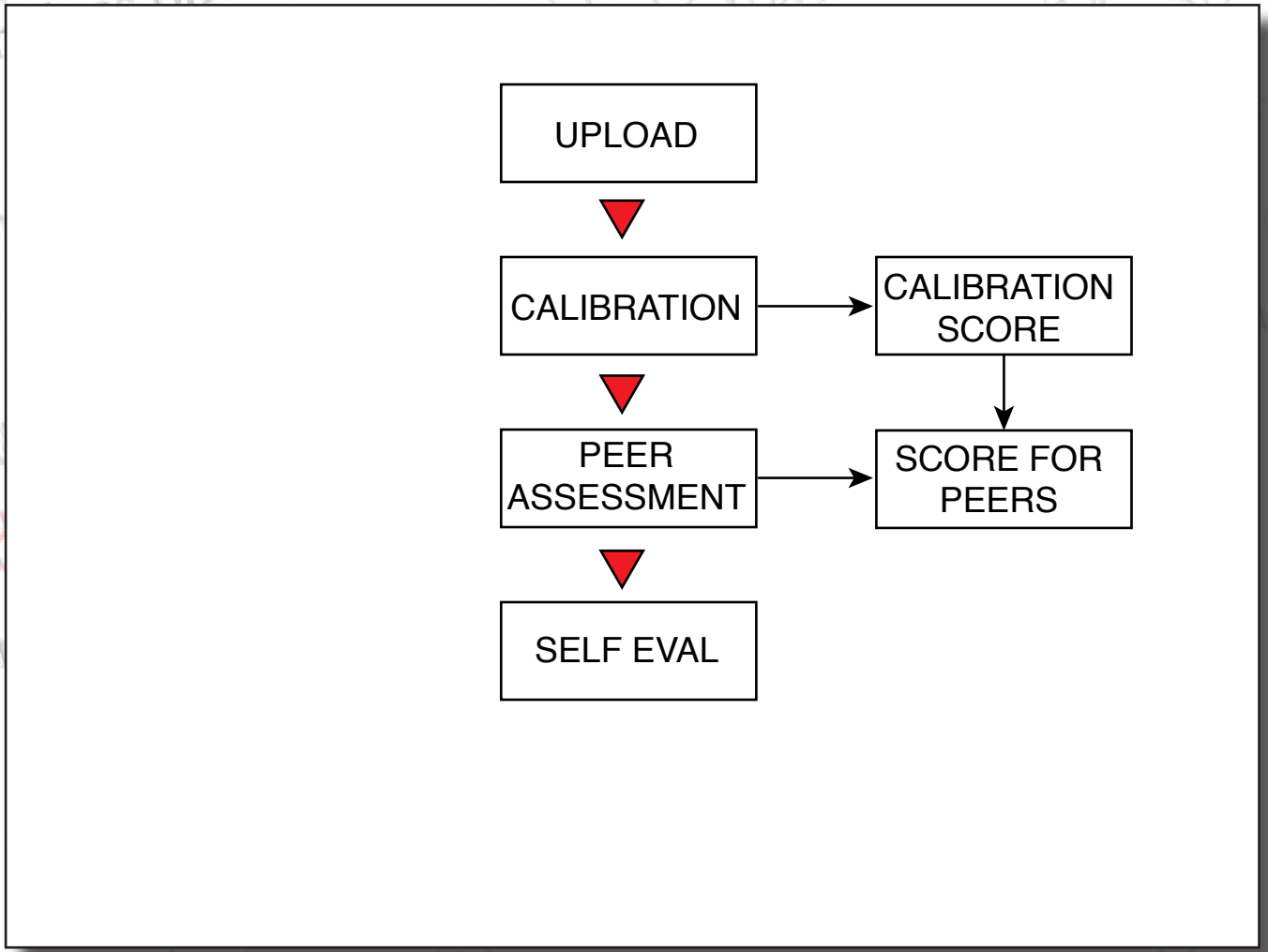
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

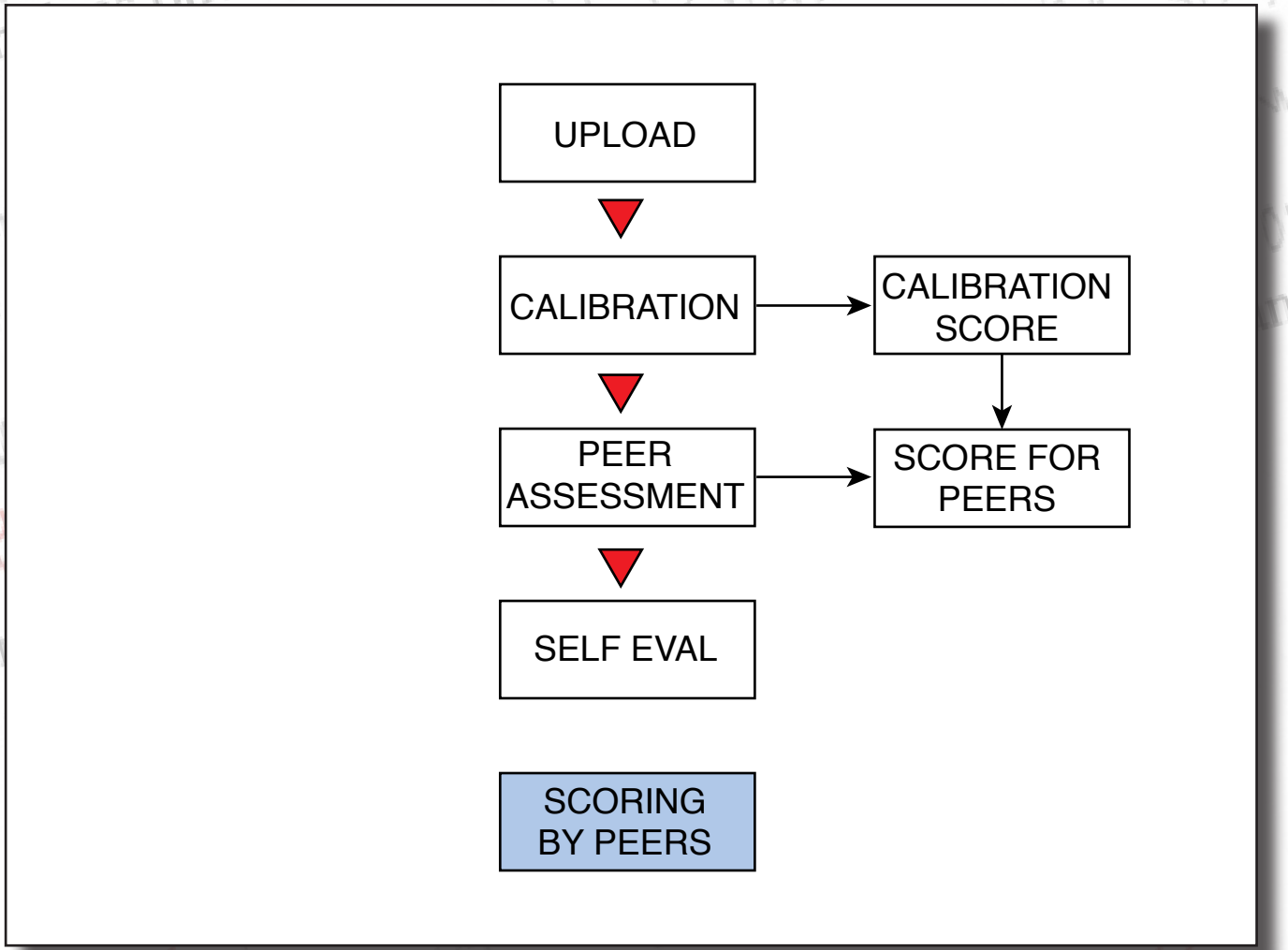
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

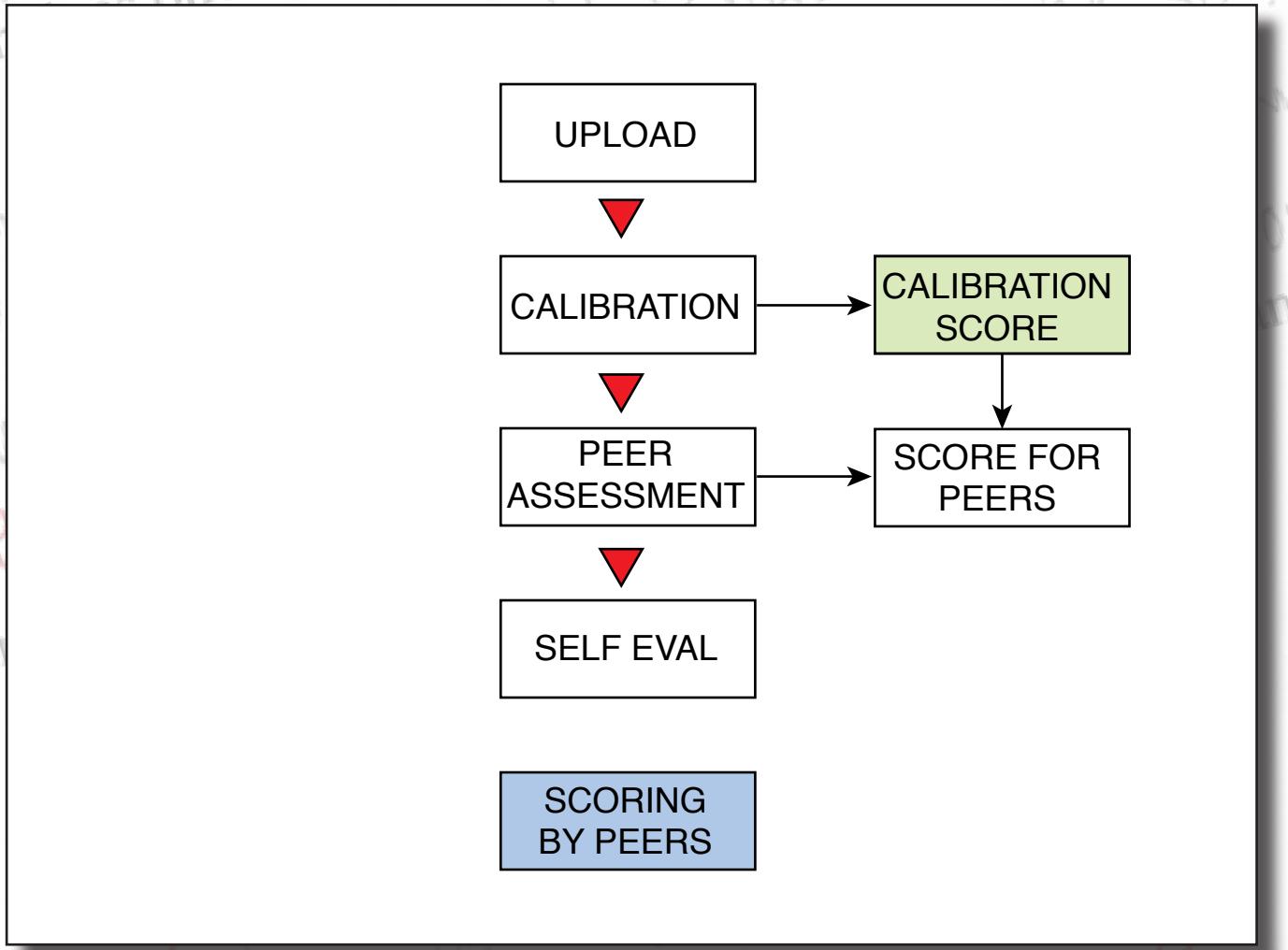
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

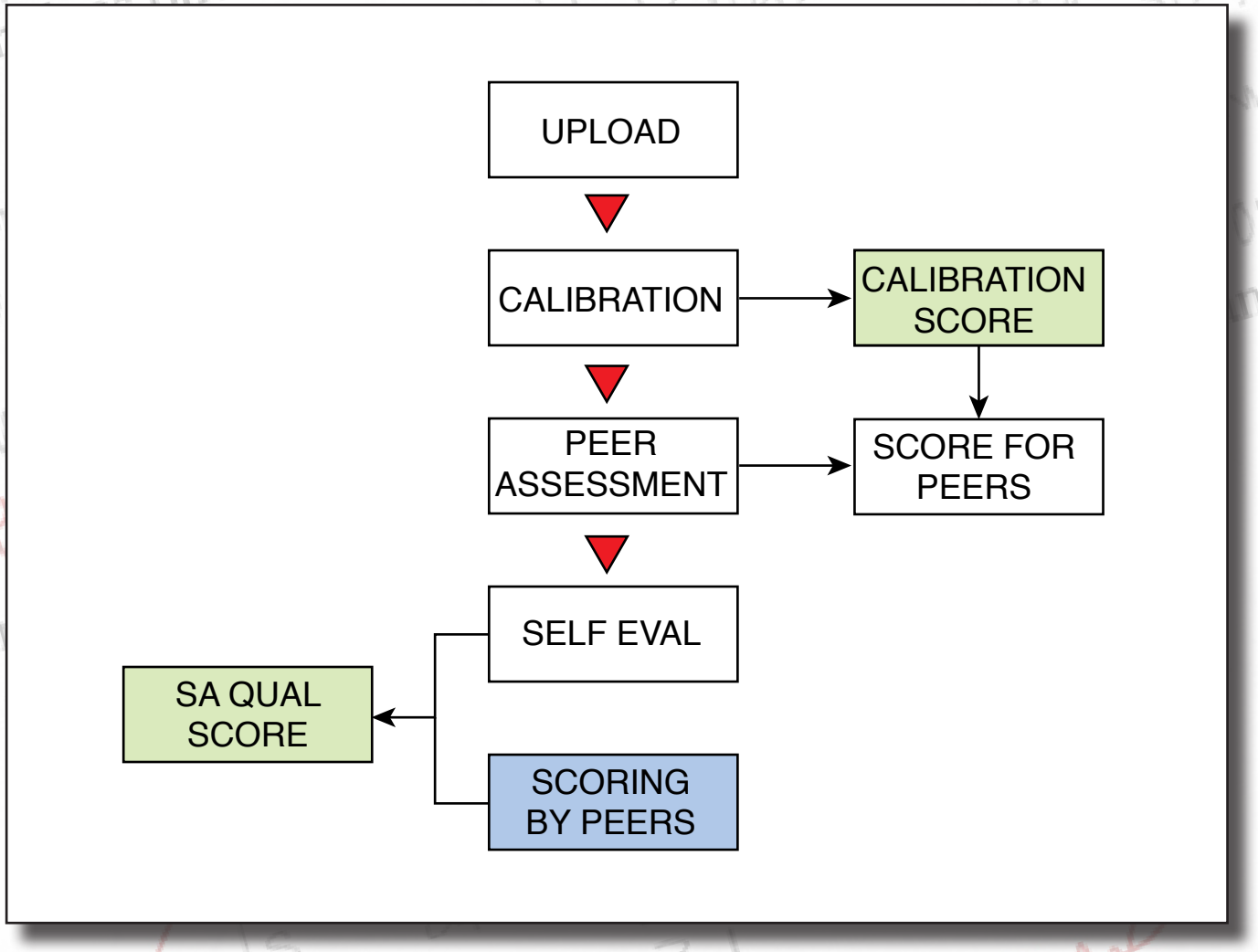
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

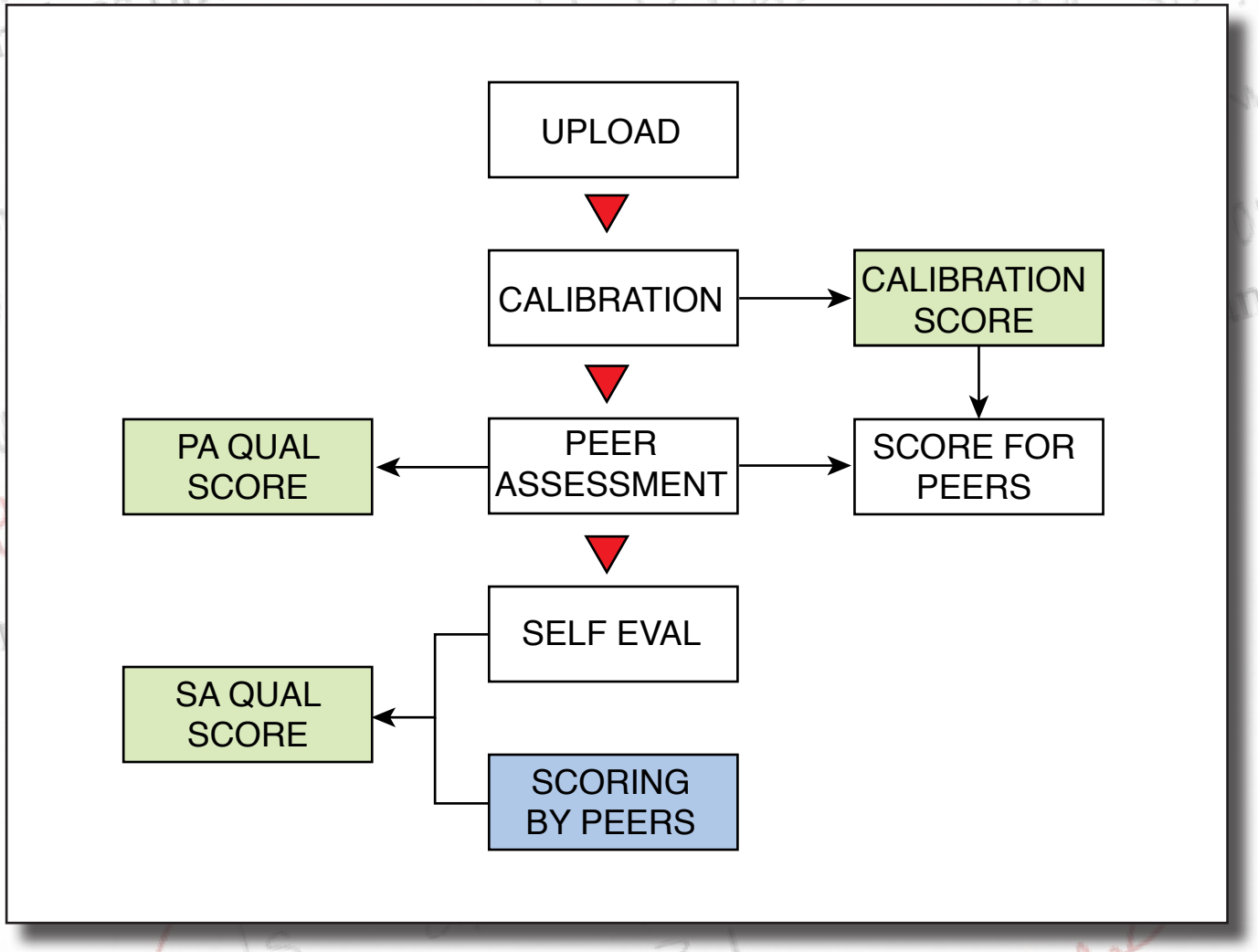
Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements

Calibrated Peer Review



cpr.molsci.ucla.edu

1 purposes 2 problems 3 improvements


rethink
assessment


mazur.harvard.edu
Follow me!
eric_mazur