

Assessment: The silent killer of learning



HHMI Professors Symposium
Howard Hughes Medical Institute
Chevy Chase, MD, 27 May 2014



Assessment: The silent killer of learning



@eric_mazur

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kosten

1. die Kosten (*pl.*)
2. kostbar

455

krank

1. die Krankheit, —, —en

COW

377

magnificent
glor

1. magnificent
2. master

430

das Kind, —(e)s, —er

1. kindisch
2. kindlich

der Kellner, —s, —

1. der Keller, —s, —

kennen

kannte-gekantt *irreg.*

1. kennen-lernen
2. erkennen
3. bekant
4. d

428

think



kosten

1. die Kosten

2. 1.

think

428

kennen

kannte-gekant

1. kennen-lernen

2. erkennen

3. bekant

4. d

Verizon 3G 4:20 PM

Flashcard

23 of 100

pedantic

adj. ostentatious in one's learning

23 of 100

Verizon 3G 4:20 PM

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**35 % retained
after 1 week**

**we only guarantee
they'll pass the test**





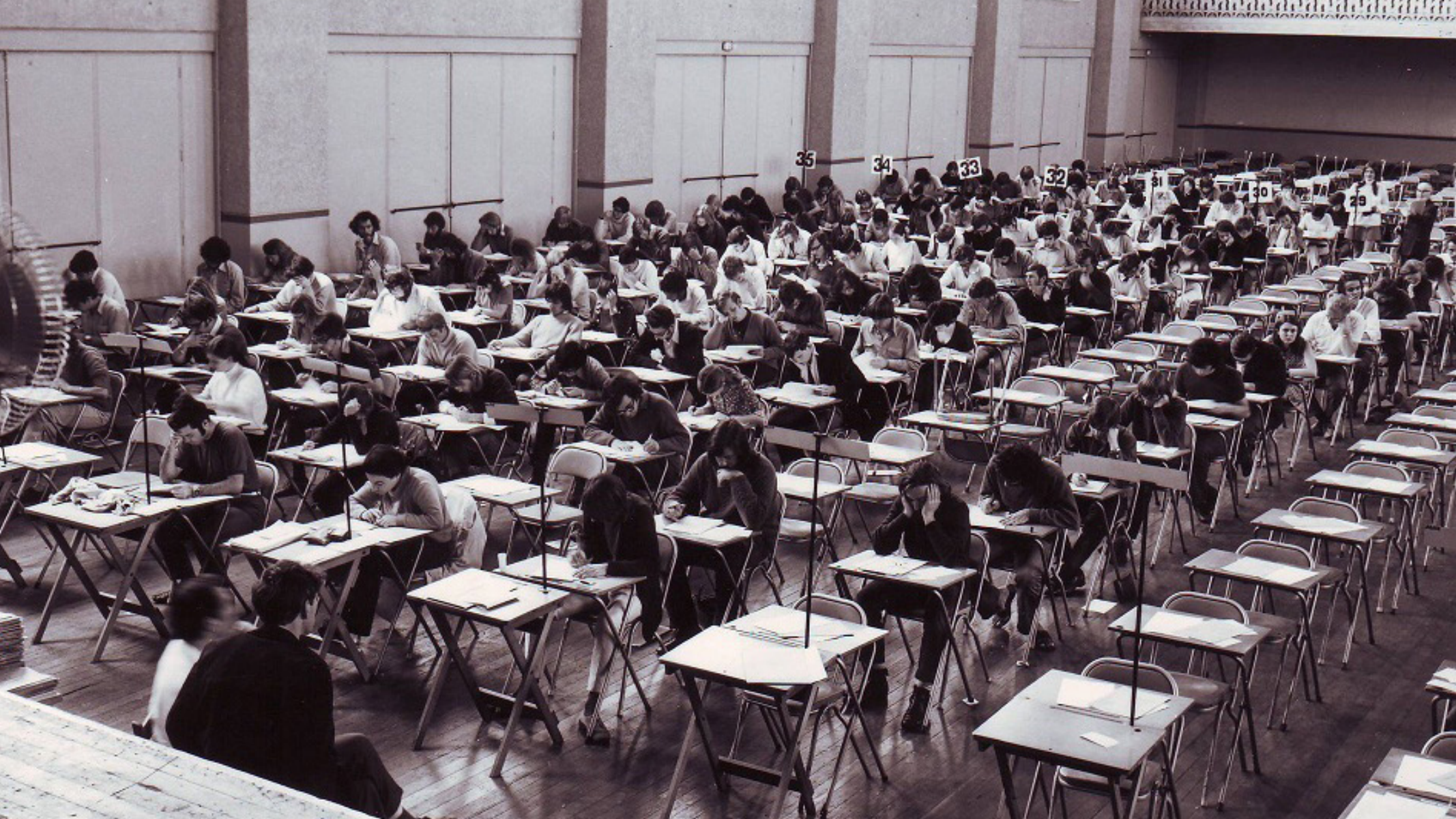
5-minute university











A large, dimly lit classroom filled with students sitting at desks, appearing to be in a lecture or exam setting. The students are mostly seen from behind, looking towards the front of the room. The desks are arranged in rows, and the room has a high ceiling with large windows or doors in the background. The overall atmosphere is one of a traditional, lecture-based educational environment.

**assessment focussed on ranking and classifying,
not on developing 21st century skills**



1 what



1 what

2 how



1 what

2 how

3 when



inauthentic tests

1 what



what is the meaning/definition of...?

1 what

A close-up photograph of a silver and red ballpoint pen lying diagonally across a piece of lined paper. The paper is covered in handwritten mathematical equations in black ink, which are slightly out of focus. The equations include terms like x^2 , x , and $1/6$.

inauthentic problem solving

1 what

problem



1 what

The background of the slide is a close-up, slightly blurred photograph of a silver and red ballpoint pen resting on a white notepad. The notepad has several handwritten mathematical problems in black ink. One prominent problem is a long division: $427 \overline{) 23}$. Other visible problems include 21×6 , 80×4 , 15×8 , 24×6 , and 20×4 .

problem

outcome

1 what

problem

outcome

KNOWN

1 what

problem

solution

outcome

KNOWN

1 what

problem

solution

outcome

UNKNOWN

KNOWN

1 what

problem

solution

outcome

UNKNOWN

KNOWN

problem

1 what

problem

solution

outcome

UNKNOWN

KNOWN

problem

procedure

KNOWN

problem

solution

outcome

UNKNOWN

KNOWN

problem

procedure

answer

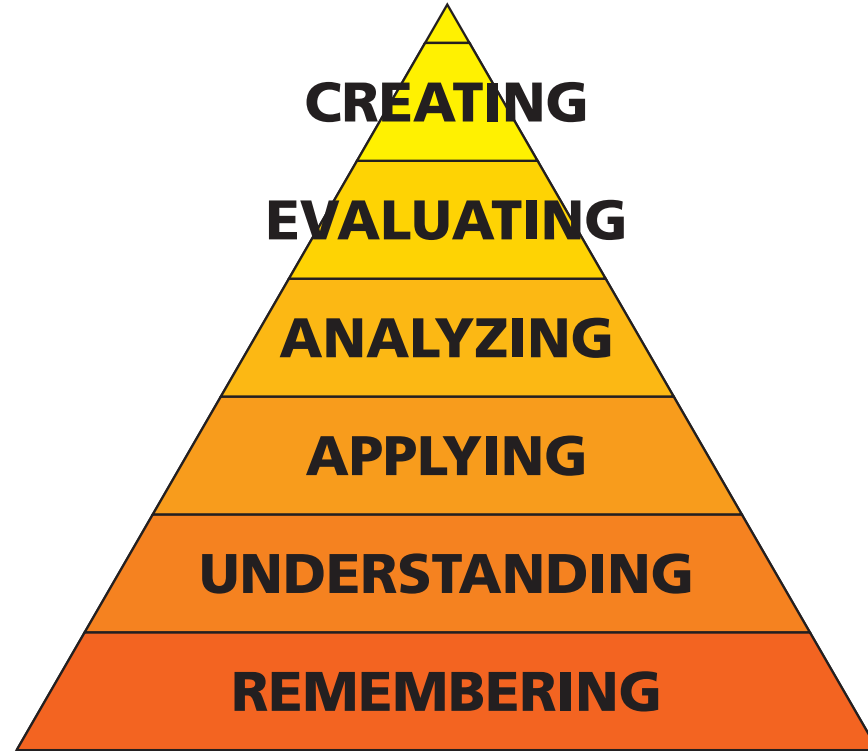
KNOWN

UNKNOWN

Thinking skills

prob

prob



problem

computers
can do this!

outcome

problem

procedure

answer

KNOWN

KNOWN

KNOWN

UNKNOWN



1 what



1 what

problem

solution

outcome

UNKNOWN

KNOWN

problem

REAL
problem solving

KN

OWN

problem

approach 1

approach 3

approach 2

outcome

grading incompatible with real problem solving

Law of conservation of mass: Sometimes called the Law of Conservation of Matter, states that mass of a closed system will remain constant, regardless of the processes taking place, provided no matter enters or leaves the system. Also, matter cannot be created nor destroyed.

Law of conservation of energy: Energy cannot be created or destroyed, only transformed from one form to another.

Law of definite composition (Dalton's Law): A compound always contains exactly the same proportion of elements by mass.

Equilibrium (boring)

Thermodynamics (boring)

Kinetics (how-chicka-wow-wow)

List the three important concepts that the study of conservation of Energy leads to:

Describe the Law of conservation of mass: Sometimes called the Law of Conservation of Matter, states that mass of a closed system will remain constant, regardless of the processes taking place, provided no matter enters or leaves the system. Also, matter cannot be created nor destroyed.

Describe the Law of conservation of energy: Energy cannot be created or destroyed, only transformed from one form to another.

Describe the Law of definite composition (Dalton's Law): A compound always contains exactly the same proportion of elements by mass.

assessment produces a conflict

1 what

assessment produces a conflict

coach or judge?

1 what

conflict resolved by:

objectivity (fairness, reliability)

1 what

Law Model

mass makes me
happy in humanity

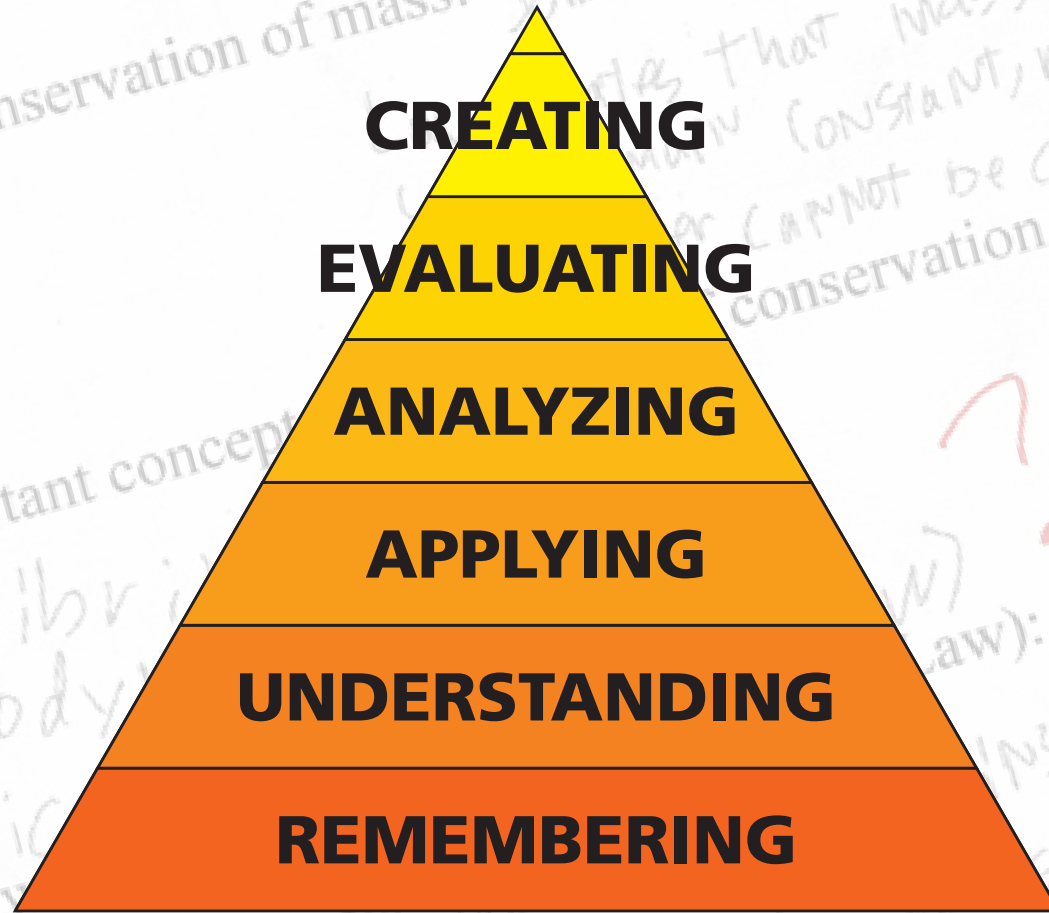
Describe the Law of conservation of mass: Sometimes called the Law, states that mass of a closed system will remain constant, regardless of the process. Also, matter cannot be created nor destroyed.

List the three important concepts that the Law of conservation of Energy leads to:
Equilibrium (boiling)
Thermodynamics (boiling)
Kinetics (how-chicka-wow-wow)

... but ...

Describe the Law of definite composition (Dalton's Law):
... always contains exactly the same parts by mass.
... at a party, Law of definite composition: Fri

1 what



1 what

**only lowest order thinking skills
can be judged objectively**

1 what



1 what

2 how



isolation

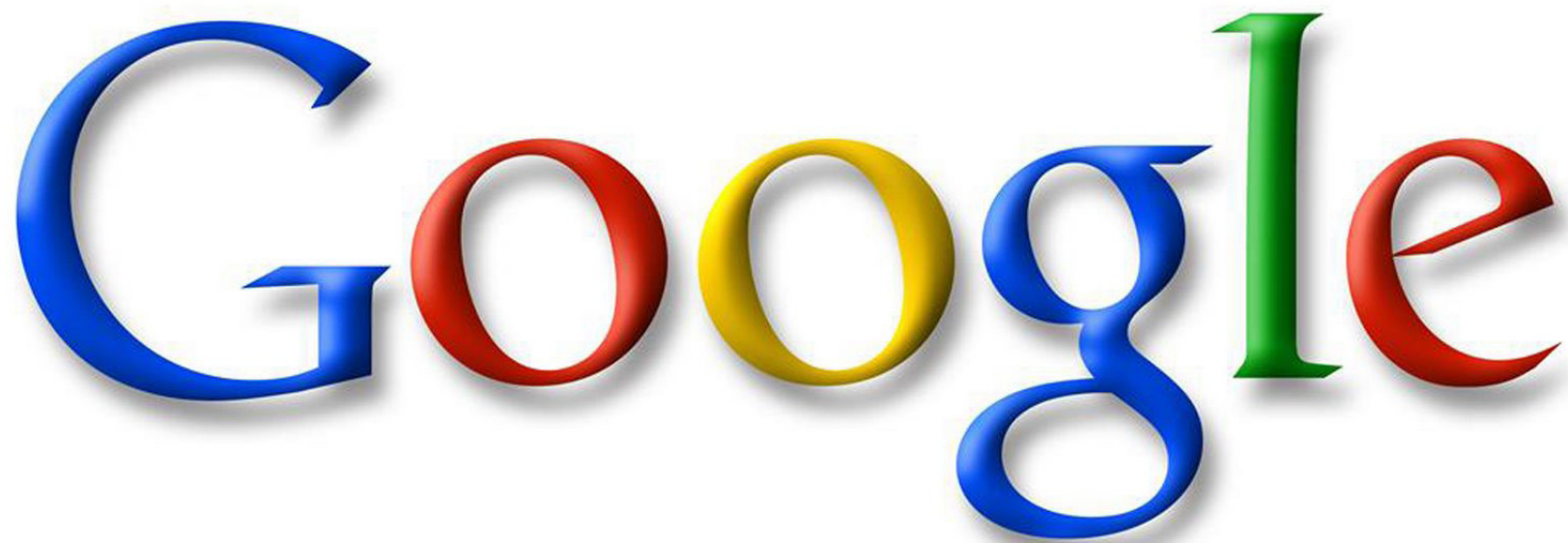
1 what

2 how



1 what

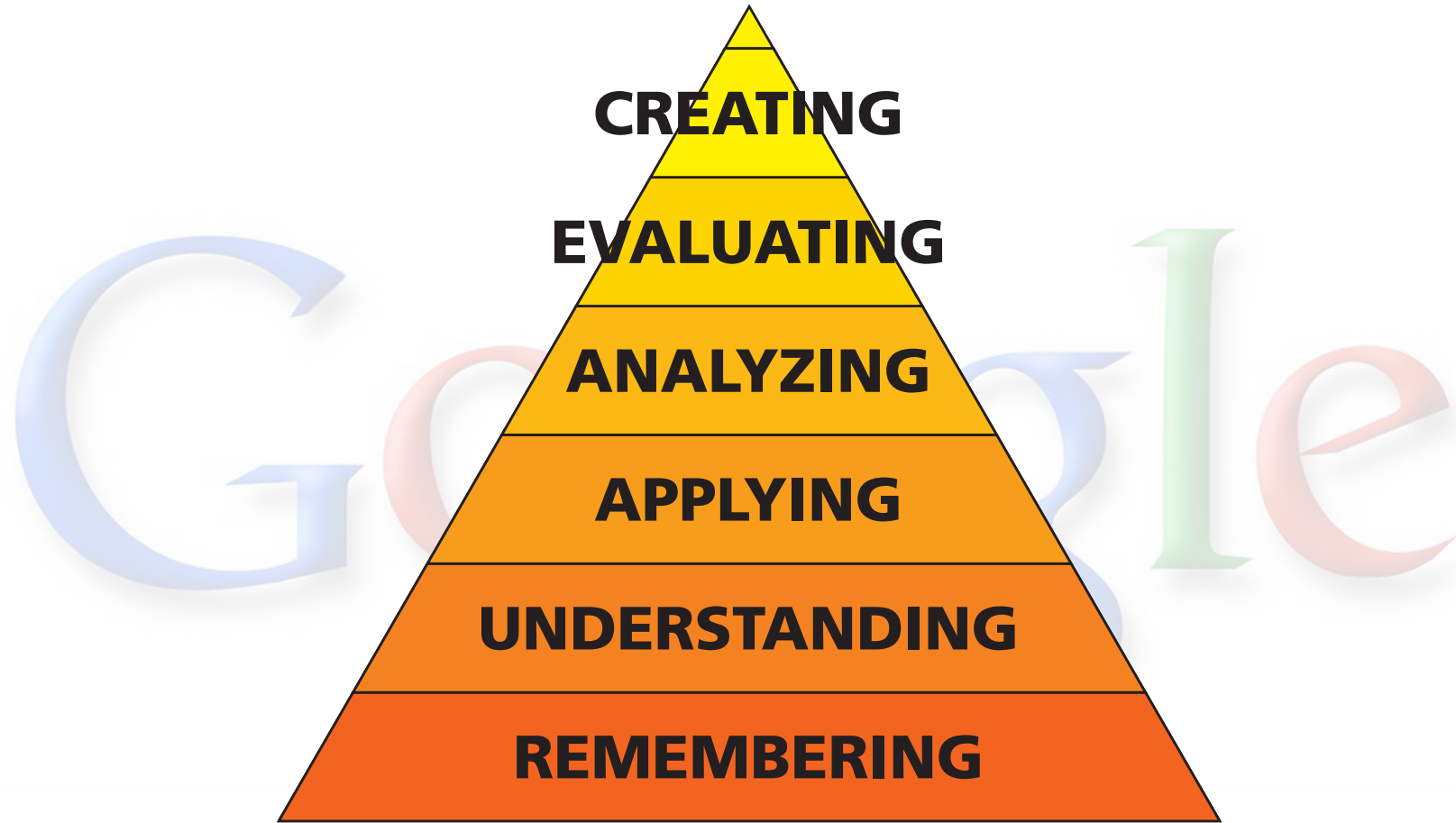
2 how

The image shows the word "Google" in its iconic multi-colored font. Each letter is rendered in a 3D style with a slight shadow underneath, giving it a floating appearance. The colors are: 'G' is blue, the first 'O' is red, the second 'O' is yellow, the first 'g' is blue, the 'l' is green, and the 'e' is red.

Google

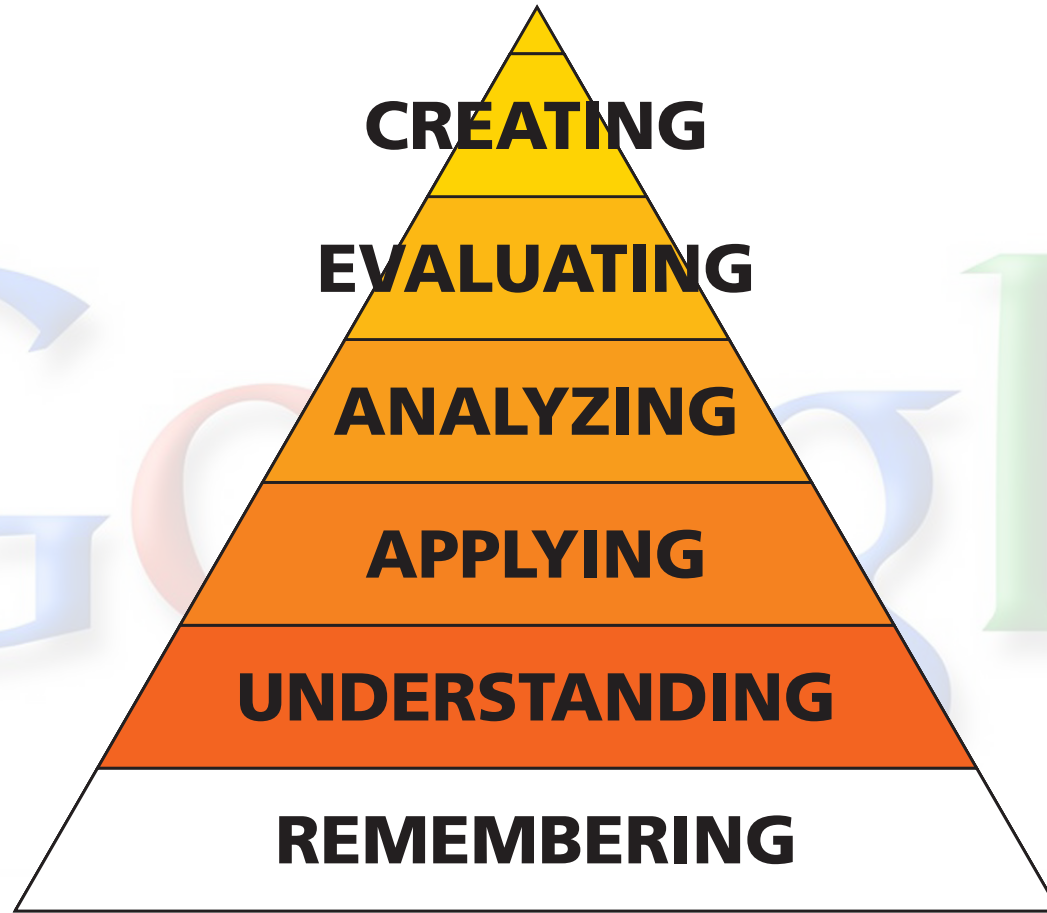
1 what

2 how



1 what

2 how



1 what

2 how



1 what

2 how

④ We will use spherical coordinates:

$$0 \leq \rho \leq 4, \quad 0 \leq \theta \leq 2\pi, \quad \frac{\pi}{2} \leq \phi \leq \pi$$

integral is thus:

$$\int_0^4 \int_0^{2\pi} \int_{\pi/2}^{\pi} (\rho^2 \sin \phi) \rho \, d\phi \, d\theta \, d\rho$$
$$= \left\{ \int_{\rho=0}^4 \rho^3 \, d\rho \right\} \left\{ \int_{\theta=0}^{2\pi} d\theta \right\} \left\{ \frac{1}{2} \int_{\phi=0}^{\pi} \sin(2\phi) \, d\phi \right\} = \boxed{0}$$

1 what

2 how

3 when

A person with dark hair is sleeping at a desk. Their head is resting on their hand, and a blue pen is held in their other hand, poised over an open book. A white mug is on the desk to the left. The scene is dimly lit, suggesting a late night or early morning.

high-stakes examinations promote cramming

A close-up of a clock face. The numbers 10, 11, 12, 1, and 2 are visible. The hands are positioned near the 12 o'clock mark, indicating a time close to midnight.

1 what

2 how

A person with dark hair is sitting at a desk, writing in a notebook with a blue pen. A white mug is on the desk to the left. A pair of red glasses is on the desk in front of the person. In the background, a clock is visible, showing the time as approximately 10:10. The scene is dimly lit, suggesting an indoor setting like a library or study.

information stored in short-term memory

1 what

2 how

3 when



no retention

information stored in short-term memory

no transfer

① what

② how

③ when

grades: measure of standing relative to others

1 what

2 how

3 when

grades: measure of standing relative to others
feedback: reflection on what has been learnt

1 what

2 how

3 when



A large, empty classroom with rows of desks and chairs, overlaid with the text "rethink assessment". The classroom is filled with rows of light-colored wooden desks and black chairs, arranged in a grid pattern. The floor is light blue with yellow and red lines. The walls are light-colored with a door visible in the background. The text "rethink assessment" is written in a large, bold, black font with a blue outline, centered over the image.

**rethink
assessment**



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