

# Assessment: The silent killer of learning



IECHE 2014  
Riyadh, Saudi Arabia, 15 April 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-gekant  
*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

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

Search

Popular

Subjects

Grade Levels

Standardized

Home

My Decks

Review

More



**35 % retained  
after 1 week**

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



A faded black and white photograph of a man with a mustache, wearing a hat and glasses, holding a cigarette and speaking into a microphone. The text "5-minute university" is overlaid in the center.

# 5-minute university



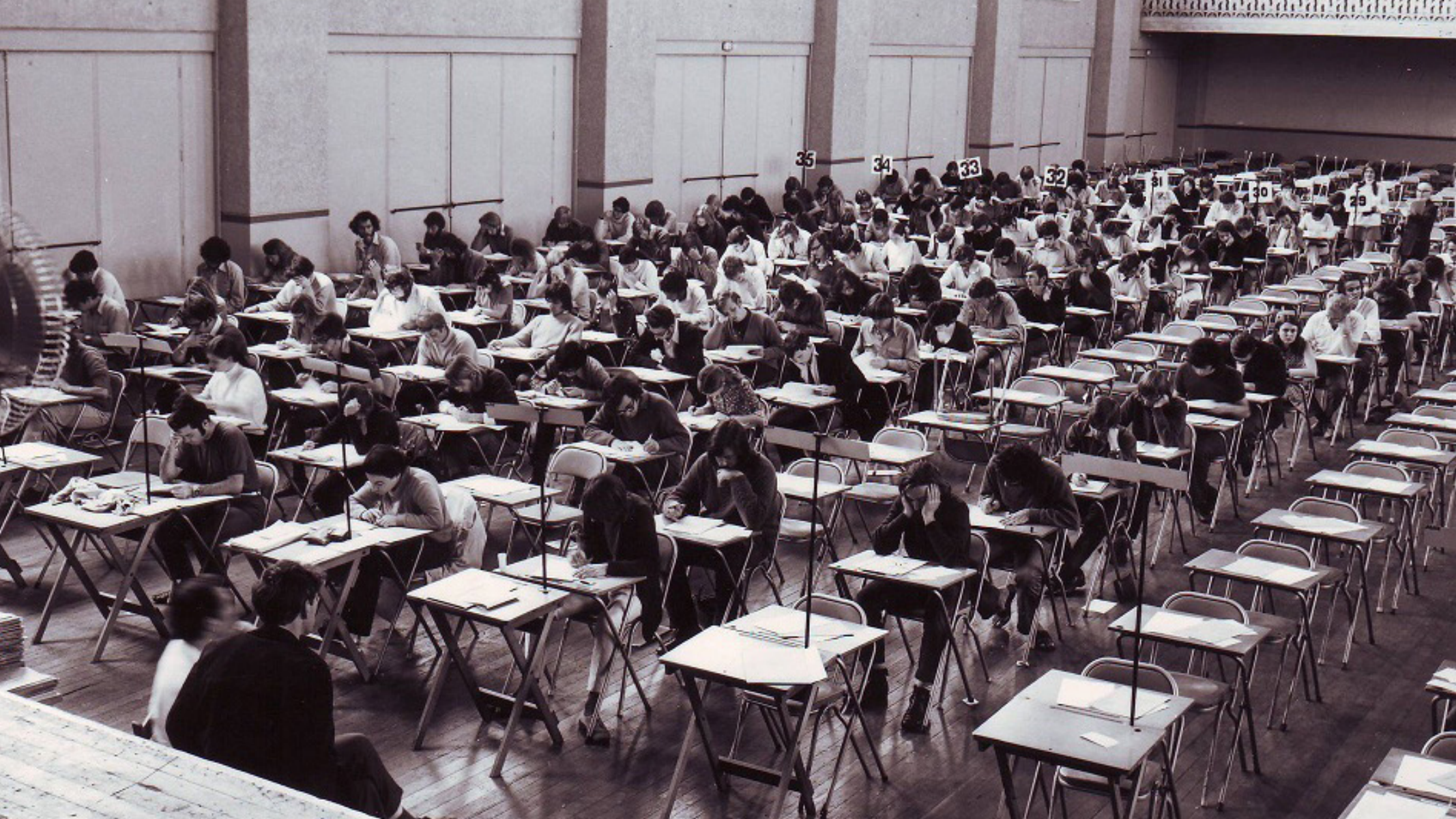














A large, dimly lit classroom filled with students sitting at desks, appearing to be in a test or lecture setting. The students are mostly seen from behind, looking towards the front of the room. The desks are arranged in rows, and the room has a high ceiling with large windows or doors in the background. The overall atmosphere is one of a formal, structured 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 pen lying on a piece of lined paper. The paper is covered with handwritten mathematical equations in black ink. The equations are somewhat blurry and include terms like  $x^2$ ,  $x$ , and  $360x^2$ . The overall scene suggests a focus on mathematics or problem-solving.

# inauthentic problem solving

1 what



**problem**



**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

1 what

problem

solution

outcome

UNKNOWN

KNOWN

problem

procedure

answer

KNOWN

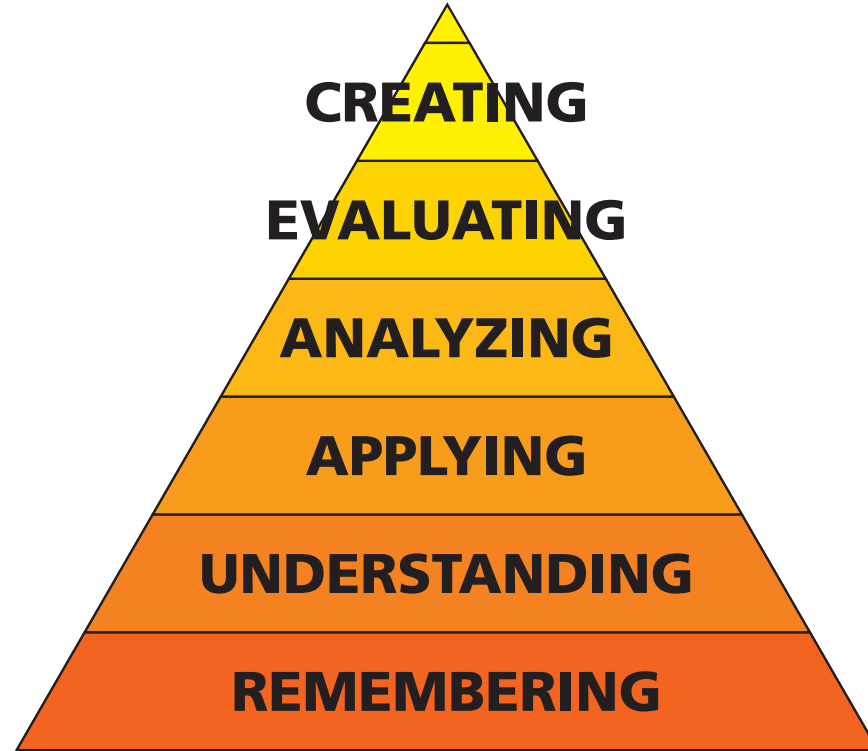
UNKNOWN



# Thinking skills

prob

prob



**On a Saturday afternoon, you pull into a parking lot with un-metered 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.**

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

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

**Requires:**

**Assumptions**

**Developing a model**

**Applying that model**



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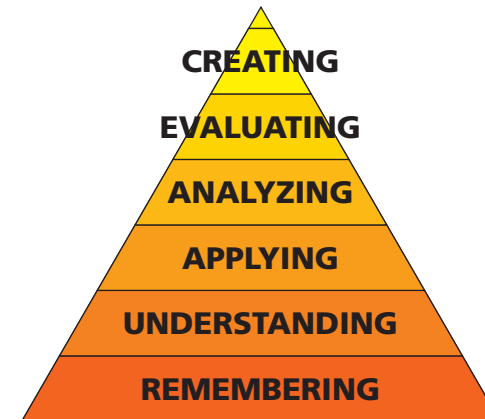
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**Requires:**

**Assumptions**

**Developing a model**

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On a Saturday afternoon, you pull into a parking lot with un-metered 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.**

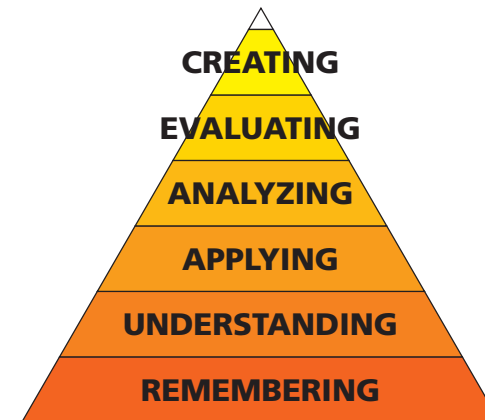
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**Requires:**

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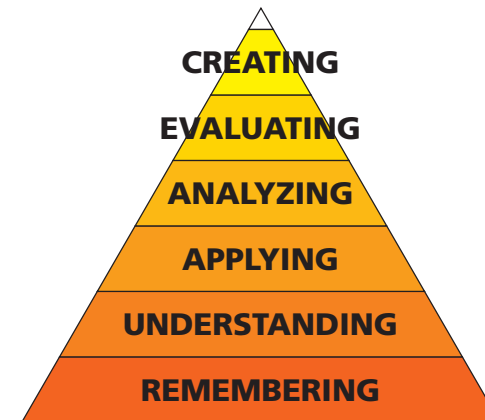
**Assuming people leave at regularly-spaced intervals, how long do you have to wait before someone frees up a space?**

**Requires:**

Assumptions

Developing a model

Applying that model



On a Saturday afternoon, you pull into a parking lot with un-metered 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.

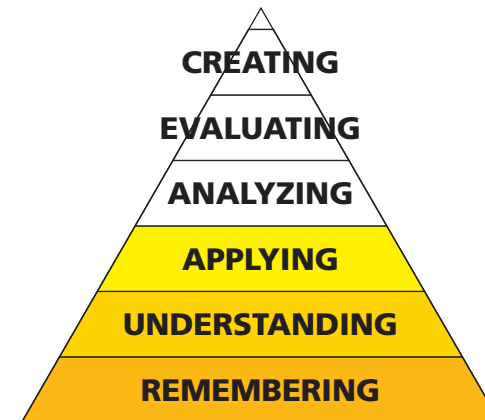
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**Requires:**

Assumptions

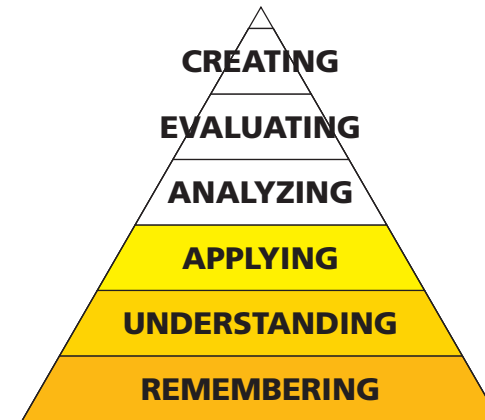
Developing a model

Applying that model



**On a Saturday afternoon, you pull into a parking lot with unmetered spaces near a shopping area, 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?**

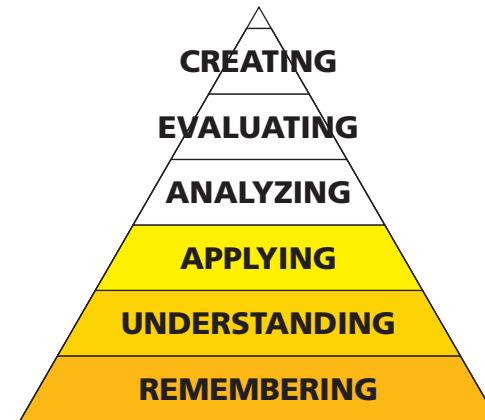




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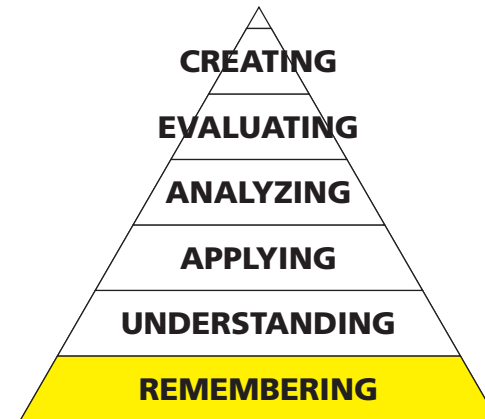
$$t_{wait} = \frac{T_{shop}}{N_{spaces}}$$



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

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



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 chemistry 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.

Mass makes me feel like I'm not the only one in humanity.

at apart, Law of conservation of mass.

Fr

# 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

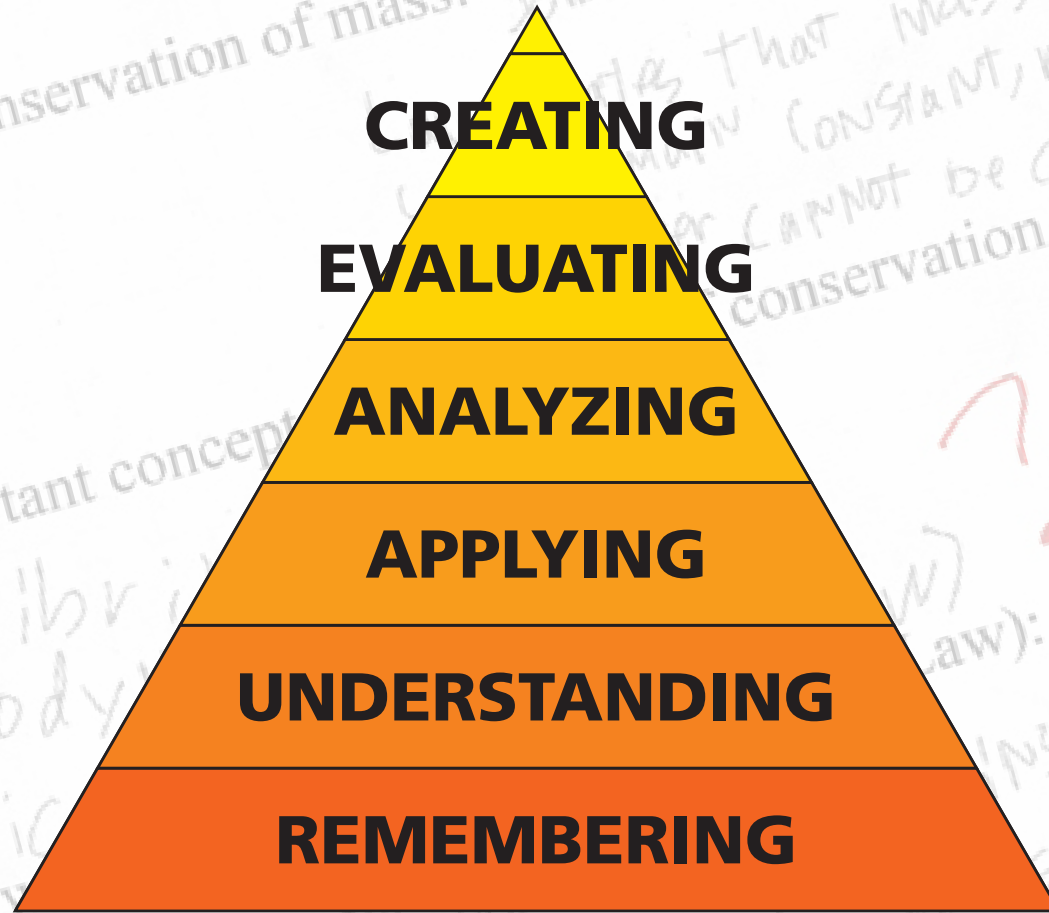
Describe the Law of conservation of mass: Sometimes called the Law, states that mass of a closed system will remain constant, regardless of the process. Also, matter cannot be created nor destroyed.

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

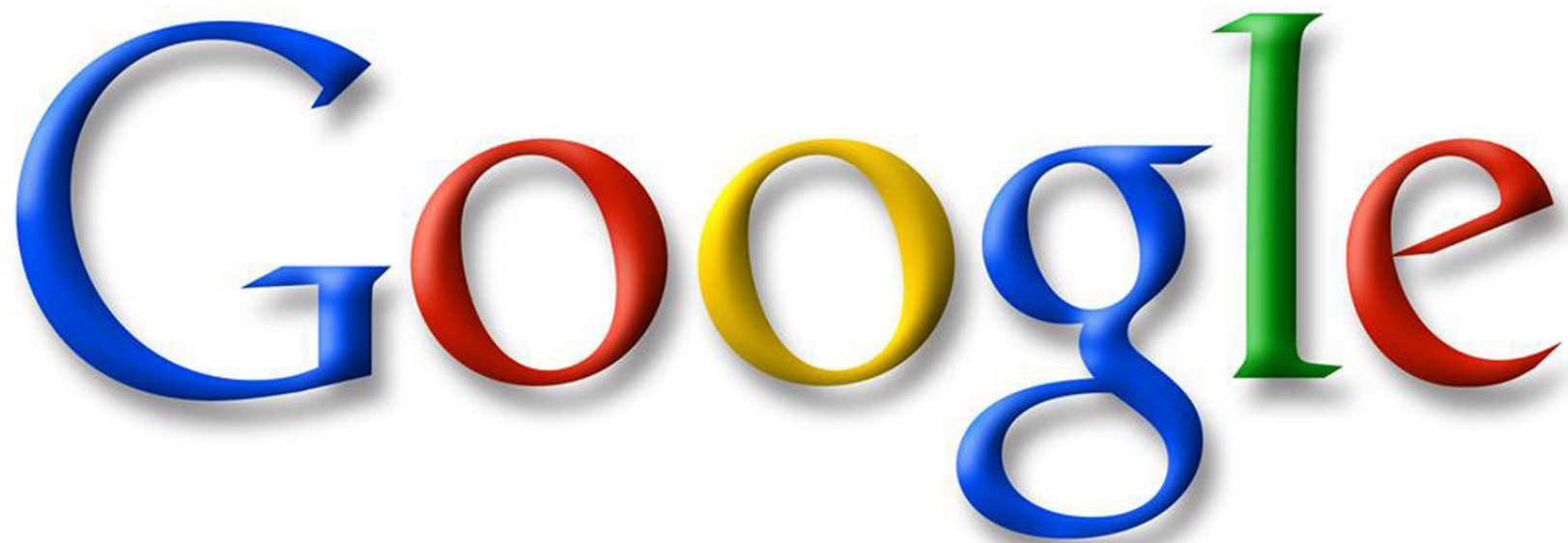
1 what

2 how



1 what

2 how

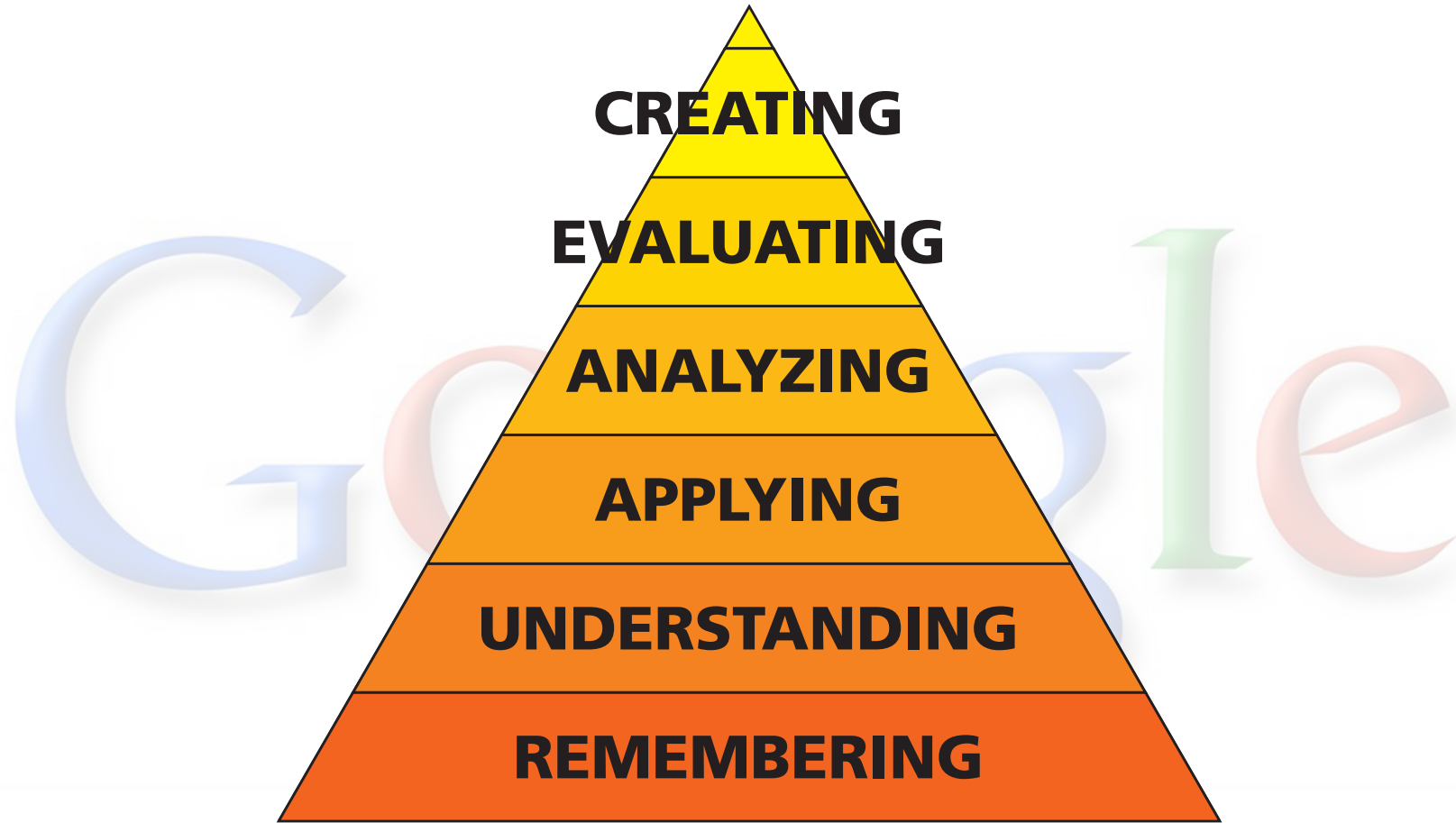
The image shows the word "Google" in its iconic multi-colored font. Each letter is rendered in a 3D style with a slight shadow underneath, giving it a floating appearance. The colors are: 'G' (blue), 'O' (red), 'O' (yellow), 'g' (blue), 'l' (green), and 'e' (red).

Google

1 what

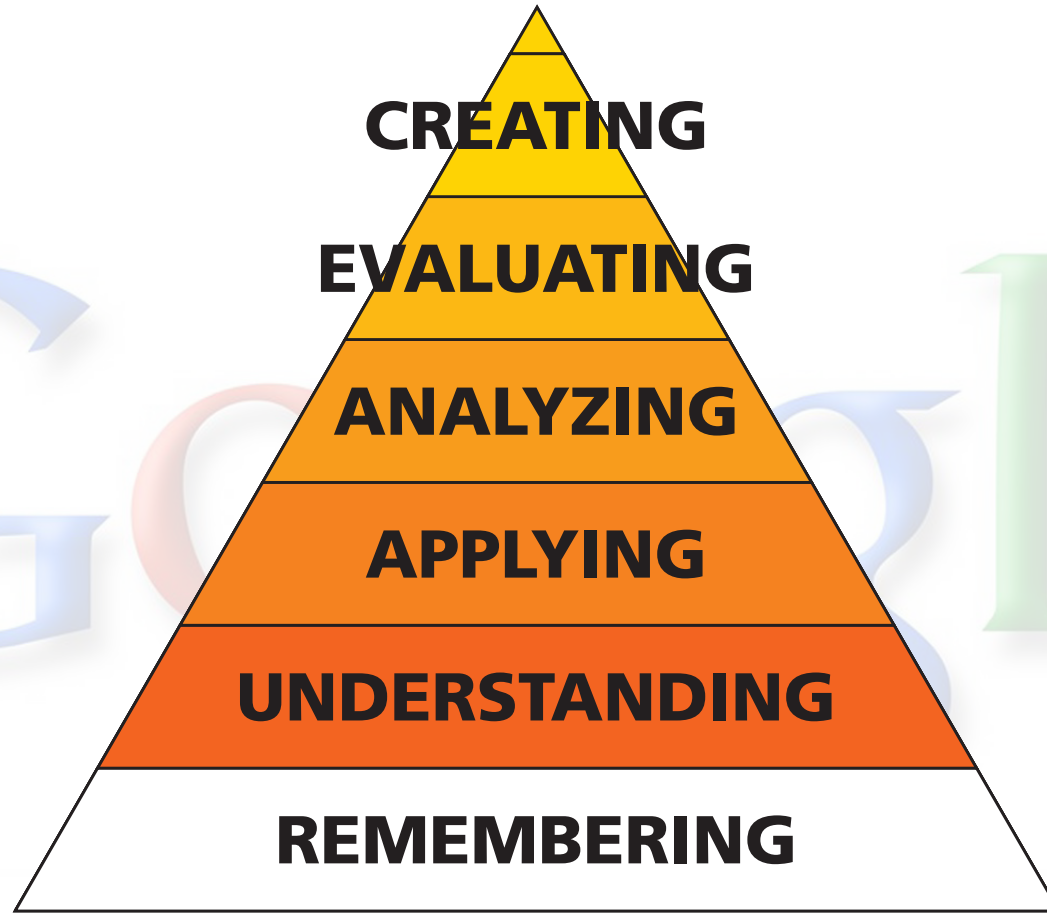
2 how





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 long 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



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-rimmed 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 marking the aisles. The walls are a light beige color, and there are several doors 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**





**mazur.harvard.edu**

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**eric\_mazur**