

FORMATIVE ASSESSMENT IN A BRAIN-COMPATIBLE CLASSROOM:

How Do We Really Know They're Learning?

INTRODUCTION

- Rituals/ Questions
- *First Grade Takes a Test*
- Types of Assessment



HIGHER ORDER QUESTIONS/TASKS

THE CHANGING FACE OF ASSESSMENT

- Famous People Who Almost Weren't!
- Multiple Intelligences/SCANS Report

PRODUCTS VS. PERFORMANCES

ASSESSMENT IMPLICATIONS OF BRAIN RESEARCH

RUBRICS

FOUR WAYS TO *KNOCK THE TOP OFF THE TEST*

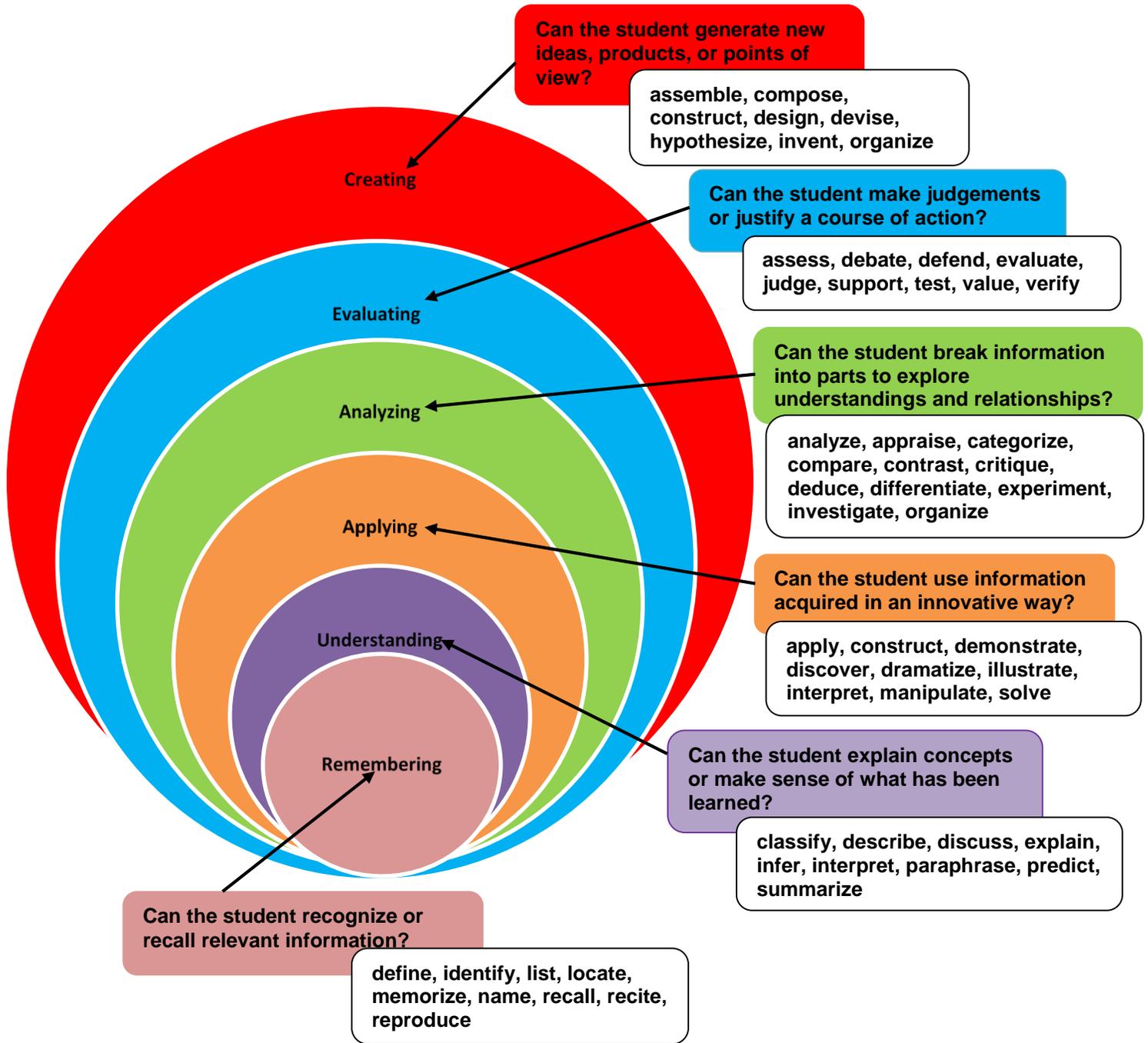


SUMMARY/CLOSURE

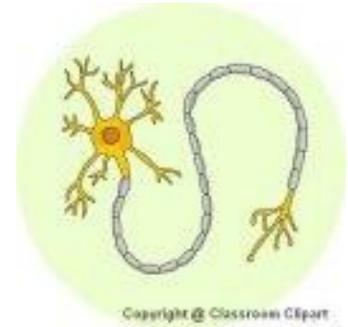


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Bloom's Taxonomy (Revised)



WHAT ARE NEURONS?



The human brain is the most complex structure in the known universe. Consisting of close to 100 billion cells, the brain is the center of our thoughts and emotions. It receives and processes information from the world around us, directs our movements and controls automatic functions of our bodies. Amazingly, all functions of the brain and nervous system are based on communication among nerve cells, also known as **neurons**.

In many ways, a neuron is like any other cell in the body. Each neuron is surrounded by a membrane, is filled with liquid and has a nucleus containing its genetic material. However, just as many other cells within the body are specialized to do a particular job, neurons are specialized to receive and transmit information. Even though they may differ in appearance, all neurons collect information either from the environment (information detected by the senses) or from other cells of the body. They transmit the information to other neurons and/or other kinds of cells (such as muscle).

A typical neuron has an enlarged area, the **cell body**, which contains the **nucleus**. Neurons typically also have several branches, or nerve fibers. The branches on which information is received are known as **dendrites**. Each neuron usually has many dendrites. Each neuron usually also has a longer tail-like structure, or **axon**, which transmits information to other cells. Axons can be branched at the tips. The axons of many kinds of neurons are surrounded by a fatty, segmented covering called the **myelin sheath**. This covering acts as a kind of insulation and improves the ability of axons to carry nervous system signals rapidly.

The end of the axon (or **axon terminal**) of one neuron usually is separated from the next cell by a tiny gap called a **synapse**. Messages traveling from one neuron to the next must cross this gap in order for the signal to continue along its path. A single neuron may be capable of receiving messages simultaneously on its dendrites and cell body from several thousand different cells.

The Theory of Multiple Intelligences

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

Gardner, H (1983). *Frames of mind: The theory of multiple intelligences*. New York: Basic Books.

The SCANS Report

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

Secretary's Commission on Achieving Necessary Skills. (1991). *What work requires of schools. A SCANS report for America 2000*. Washington, DC: US Department of Labor.



ASSESSMENT ACTIVITIES

PRODUCTS	PERFORMANCES
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
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25.	

Implications of Brain Research

**BRAIN
ASSUMPTIONS**



**ASSESSMENT
IMPLICATIONS**

<p><i>Neurons that fire together wire together</i> (Jensen & Dabney, 2000; Medina, 2008).</p>	
<p>The brain reacts negatively to high stress or threat (Willis, 2006; Fogarty, 2009).</p>	
<p>True learning occurs when both hemispheres of the brain are involved (Jensen, 2008; Medina, 2008).</p>	
<p>Learning is <i>state</i> dependent (Goleman, 1992; Hattie, 2009).</p>	
<p>It is easier to retrieve <i>episodic memories</i> (Jensen, 2008; Sprenger, 2007).</p>	
<p>Information is learned and remembered best in a relevant, authentic environment (Diamond, 1998; Willis, 2006).</p>	



BIRTHDAY PARTY RUBRIC

CRITERIA	4	3	2	1
LOCATION/ ENTERTAINMENT				
FOOD				
GIFTS				

***CRI* When Thinking of Rubrics**

When giving consideration to using a rubric to assess students' products and performances, start at the beginning with a good *CRI*. No, I am not asking you to shed tears. *CRI* is a mnemonic device for the three components of a simple analytic scoring rubric.

✓ **C** stands for the *criteria or dimensions* of the product or performance to be assessed. In other words, what are the categories to be considered during the assessment process? Most rubrics have between four and eight criteria or dimensions.

✓ **R** stands for *rating scale*. In other words, how are the criteria or dimensions going to be assessed? Most rating scales have between three to five levels of performance with the lowest number typically assigned to the lowest acceptable level of performance and the highest number assigned to the highest level. When constructing a rubric, it is often better to determine what would constitute the lowest and highest level of performances before determining the medial levels which are more difficult to discern.

✓ **I** stands for a continuum of *indicators* that will define every level of the dimension. The indicators should be written in student-friendly language and exhibit a clear difference in progression of the levels of performance required.

Be *SAD* When Thinking of Rubrics

When creating relevant rubrics, not only do you want to start with a *CRI* but you should also be *SAD*. *SAD* is another mnemonic device which stands for the following three attributes of an effective rubric:

✓ **S** – stands for *standardized*. When a grade level or a department plans a product or performance for the purpose of determining if students are really learning, teachers should work together to be certain that the same rubric is consistently used in every class and applies to all students involved in the project or performance. Teachers should reach consensus as to what each indicator should include and how it should be rated. Many textbooks and curriculum guides contain rubrics that have already been developed to assess major concepts. Teachers may want to use those rubrics rather than developing new ones that may not be any better than the ones already provided.

✓ **A** – stands for *attainable*. If you are developing a rubric, students need to perceive themselves as capable of achieving the highest level of that rubric. Students should be shown what that highest level looks like so they will know to what to aspire.

✓ **D** – stands for *defendable*. While a constructed-response assessment could never be as objective as a selected-response assessment, every effort should be made to ensure that the rubric is as less subjective as possible. If a parent comes in and wants to know why her child's poster received a three, and not a four, on the rubric, a teacher should be able to definitively respond with the difference between the indicators of a #3 and a #4. In other words, the score given on the rubric should be explained and defended to anyone who asks. -8-

Analytic Rubric Template

Curricular Objective: _____

Product/Performance: _____

	4	3	2	1	SCORE
Criteria #1					
Criteria #2					
Criteria #3					
Criteria #4					
					TOTAL

STRATEGIES

THAT TAKE ADVANTAGE OF HOW
THE BRAIN LEARNS BEST



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____



BRAIN COMPATIBLE LESSON PLAN

LESSON OBJECTIVE(S): What do you want students to know and be able to do?

ASSESSMENT (TRADITIONAL / AUTHENTIC) : How will you know if your students have mastered essential learning?

WAYS TO GAIN / MAINTAIN ATTENTION (PRIMACY): How will you gain and maintain students' attention? Consider need, novelty, meaning, or emotion.

CONTENT CHUNKS: How will you divide and teach the content to engage students' brains?

Lesson Segment 1:

Activities:

Lesson Segment 2:

Activities:

Lesson Segment 3:

Activities:

BRAIN - COMPATIBLE STRATEGIES: Which will you use to deliver content?

- Brainstorming /Discussion
- Drawing / Artwork
- Field Trips
- Games
- Graphic Organizers / Semantic Maps / Word Web
- Humor
- Manipulatives / Experiments / Labs / Models
- Metaphors / Analogies / Similes
- Mnemonic Devices
- Movement
- Music / Rhythm / Rhyme / Rap
- Project / Problem - Based Learning
- Reciprocal Teaching / Cooperative Learning
- Roleplays / Drama / Pantomimes /Charades
- Storytelling
- Technology
- Visualization/Guided Imagery
- Visuals
- Work Study/Apprenticeships
- Writing/Journals