

Author(s): Chris Chapman, 2011-2012

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Empowering the Medical School Educator to Teach More Effectively

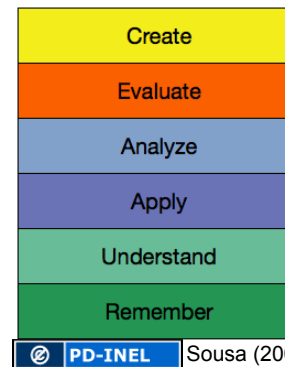
By: Chris Chapman, Media Services Manager, MultiMedia Development, University of Michigan Medical School
Assignment for: *Principles of Classroom Learning* - Eastern Michigan University - 2011

You Will Learn to...

- Teach learners to remember & use what they learn
- Design your instruction around important concepts
- Think creatively
- Make your small groups more collaborative
- Use motivation in learning & professional practice
- Build review & reinforcement into your instruction



 Mercy Health, flickr



Alternate images available from
<http://www.med.umich.edu/lrc/medcurriculum/>

 Sousa (2009)

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1) Learning Objectives

You Will Learn to...

- Teach learners to remember & use what they learn
- Design your instruction around important concepts
- Think creatively
- Make your small groups more collaborative
- Use motivation in learning & professional practice
- Build review & reinforcement into your instruction



Mercy Health, flickr

2) What is Learning & Instruction?

“Learning

- Is a change
- In what the learner knows
- Caused by a learning experience”

(Mayer, 2011, p. 14).

“Instruction is

- Manipulating what the learner experiences
- With the intention to cause a change in the learner’s knowledge”

(Mayer, 2011, p. 52).

Are you **intentional** in your instructional practices?

Learning and Instruction

Relations among Instruction, Learning, and Assessment

What the instructor
does:

Manipulation

What goes on in the learner's mind:

Experience

Knowledge

What the learner
does:

Performance

Instruction: Manipulation causes experience

Learning: Experience causes knowledge

Assessment: Knowledge enables performance

Aim for “Deep Learning”

- Characteristics of Deep Learning
 - Significant cognitive processing
 - Learner makes an effort to make sense of the material
 - The learning is remembered
 - The learning can be used in future situations
 - Deep learning is **meaningful** to the learner

(Mayer, 2011)

A Closer Look at Active Teaching and Learning

- Please read the **HANDOUT 1** entitled, “*A Closer Look at Active Teaching and Learning*” (Mayer, 2011, pp. 86-87).

3) Small Group Discussion (15 min)

- Can your students “meaningfully learn” from lectures?
- If so, how?
- If not, why?

4) Making the Case: Why We Need to Teach Creative Thinking in a Scientific Curriculum

Chris Chapman - *Principles of Classroom Learning* - Eastern Michigan University - 2011

What You Will Learn

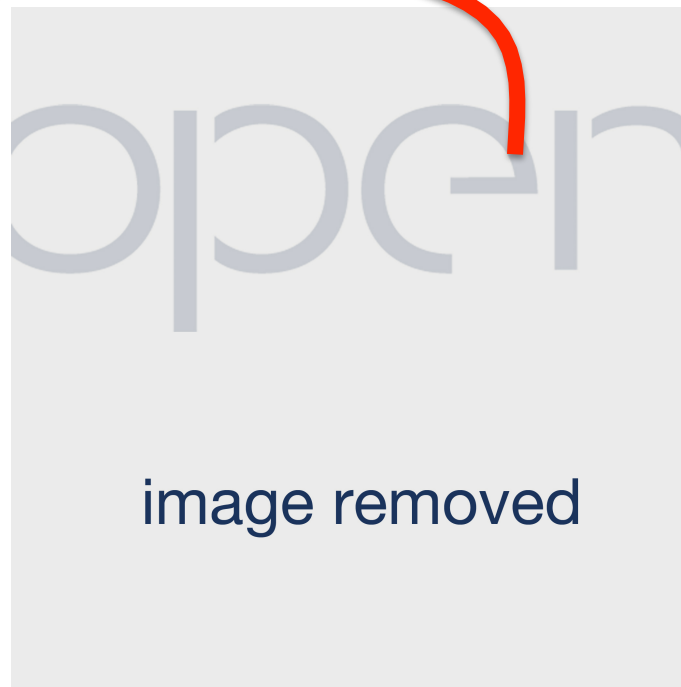
- Why scientists (and your students) need to be able to think creatively
- The differences between creative and critical thinking
- How Bloom's Revised Taxonomy can help you understand the relationship between creative and critical thinking
- Ways to develop creative thinking in your students



Why We Need Creativity in Science

How to Succeed in Science

“There are four requirements for a successful career in science: knowledge, technical skill, communication, and originality or creativity. Many succeed with largely the first three. Those who are meticulous and skilled can make a considerable name by doing the critical experiments that test someone else’s ideas or by measuring something more accurately than anyone else. But in such areas of science as biology, anthropology, medicine, and theoretical physics, **more creativity is needed** because phenomena are complex and multivariate” (Loehle, 1990).

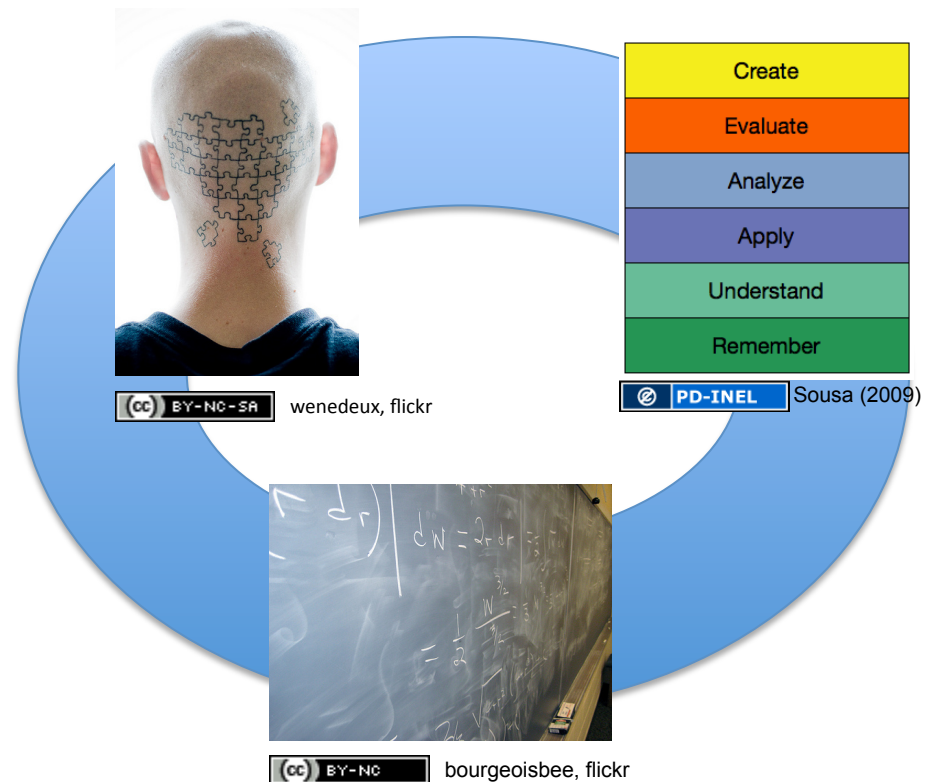


Please see original image of the “*PhD Research Process*” guide from the Mechanosynthesis Group at the University of Michigan (<http://www.mechanosynthesis.com/>).

Defining Critical and Creative Thinking

Before I convince you that developing the creative thinking skills in your students is essential, I must first describe two main terms used in this presentation:

- **Critical thinking**
- **Creative thinking**




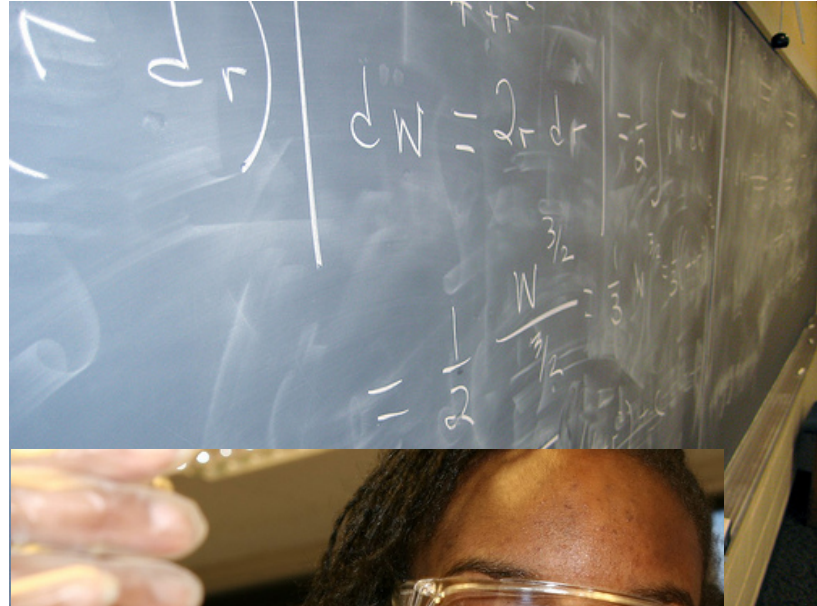
What is Critical Thinking?


“Critical thinking is a complex process that is based on objective standards and consistency. It includes making judgments using objective criteria and offering opinions with reasons” (Sousa, 2006, p. 246).

Being able to think critically is an essential skill for all scientists. Some might argue that critical thinking is the foundation of the scientific method.

Schools often emphasize the development of critical thinking skills in their curricula (e.g., remembering facts, understanding and applying theories, etc.). However, schools also need to help students develop their creative thinking skills.

 bourgeoisbee, flickr



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What is Creative Thinking?

Steve Jobs on Creative Thinking

“Creativity is just connecting things. When you ask creative people how they did something, they feel a little guilty because they didn’t really do it, they just saw something. It seemed obvious to them after a while. That’s because they were able to connect experiences they’ve had and **synthesize new things.** And the reason they were able to do that was that they’ve had **more experiences** or they have **thought more about their experiences** than other people” (Wolf, 1996).



Figure 1. Steve Jobs with the iPhone 4 in 2010 (Yobe, 2010).



Matt Yohe, Wikimedia Commons

Make sure you understand that although creativity is often associated with the arts, music, theatre, etc. In this context, creativity is a cognitive process that can include, but ultimately goes beyond “the arts.”

Comparison: Critical Thinking vs. Creative Thinking

Critical thinking tends to be more...	Creative thinking tends to be more...
Linear	Non-linear, iterative
Rational/Reasoned	Intuitive
Quantitative	Qualitative
Objective	Subjective
Convergent	Divergent

Use *Bloom's Revised Taxonomy* to Understand Critical and Creative Thinking

Bloom's Revised Taxonomy (Figure 2) is a model that represents six levels of human cognition. The categories are on a continuum moving from least complex (remember) to most complex (create). Creative thinking is not simply found in the "create" category, but in lower levels as well. There is no sharp divide between creative thinking and critical thinking, as people move fluidly between the levels (Sousa, 2006).

Use the notation of the sides of the picture further differentiate and discern your understanding of creative and critical thinking.

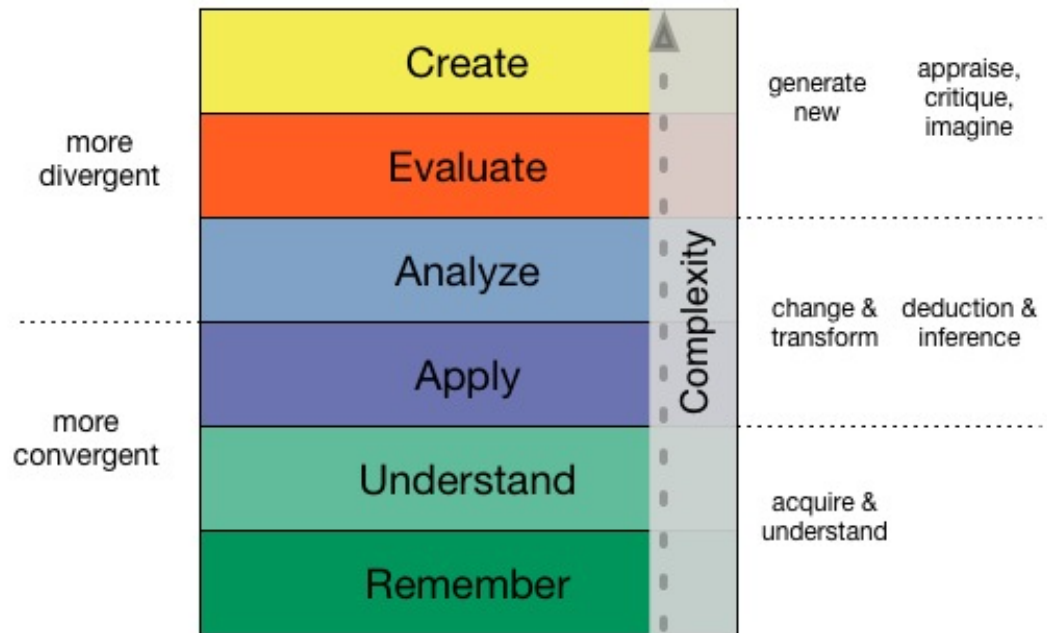
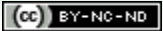


Figure 2. Bloom's Revised Taxonomy as adapted from Sousa (2009).



Make sure you understand that "complexity" refers to the level of cognitive processing one has to use to work with information. "Remember" is a simple form of cognitive processing, while, at the top of the taxonomy, "Evaluating" and "Creating" are more sophisticated and "complex" forms of cognitive processing (Sousa, 2006).



JorgeMiente.es, flickr

Teach Your Students to Think Creatively

Creative thinking is a process that can be taught and learned. It is a process that is concerned with generating new ideas, breaking out of old patterns, and looking at things differently (de Bono, 2010).

One method for developing the creative process of the individual or the group is to use the Six Thinking Hats method (de Bono, 1999).

In this method, students are asked to think in various ways. For your class, an activity is to simply ask students to “wear one of the hats” while describing their response to an idea or situation, or coming up with a new idea.



- Red hat (emotion): simply ask students to describe how they feel about the topic, idea, etc. without justification.



- Black hat (what’s wrong with the idea): ask students to provide reasons why an idea will not work.



- Yellow hat (what’s good about the idea): ask students to state positive possibilities or outcomes about an idea.



- White hat (the facts): ask students to list the facts and only the facts about the idea or topic.



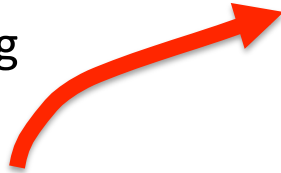
- Green hat (out of the box): ask students to generate new ways of thinking about the idea without worrying about “practicalities.”



- Blue hat (decision time): ask students to make a decision or create a plan based on the ideas, thoughts, and feelings from the other hats.

Borrow this Scientist's Approach to Teach Your Students the “How” of Creative Thinking

In his “PhD Research Guide,” John Hart (2011) offers his Mechanical Engineering doctoral students the following advice or principles to follow to develop and expand their creative thinking skills:

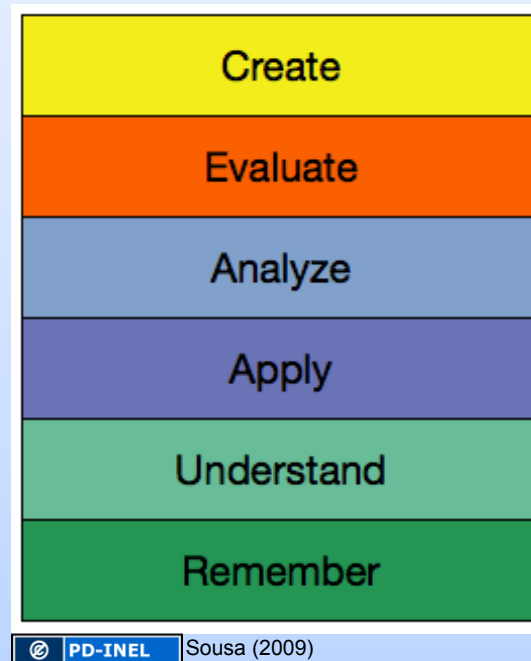


The Process of Being Creative (How)

- **Always ask questions**
 - What, why, where, how
- **Explain your ideas to others, talk with experts**
 - What do they ask about?
- **Systematic variation**
 - Consider all permutations
- **Reversal and reciprocity**
 - Start with the end goal and work backwards
 - Take your current idea and do the opposite

5) All Class Discussion (15 min)

- Is there a place for creative thinking in clinical practice?
 - Yes?
 - No?
 - Obstacles?
 - Opportunities?
 - Elaborate



6) Meaning Making for the Medical Student

- Organize information around clinical problems
- Focus on the key concepts
- Avoid redundant information
- Avoid unnecessary details
- Reinforce the key concepts throughout
 - Each learning activity (lecture, group, etc.)
 - The entire course



 Mercy Health, flickr

Organize Information Around Clinical Problems

- Learning can be facilitated when the learning is related to a future situation (similarity, hugging) (Sousa, 2006)
- For medical students, this means relating information to clinical situations and problems



 Mercy Health, flickr

Use “Similarity” and “Hugging” in Medical Education

Discipline	Clinical Application
Anatomy	Surgery
Physiology	Disease presentation
Communication skills	Patient interviewing
Pharmacology	Pharmaceutical treatment


Key Point: Connect a clinical application to the discipline being taught.

Use Case-based Teaching Methods to Link Learning to Clinical Practice

Introduction to M4 Therapeutics

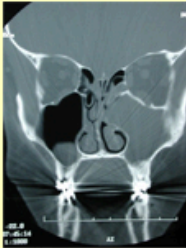
umich.edu <https://ctools.umich.edu/access/content/group/0fcb55ad-d442-4d0e-a956-88cf90237>

Ear, Nose, and Throat [Case 1](#) [Case 2](#) [Case 3](#) [Syllabus](#) [Get References](#)



A sinus CT scan is performed and shows the following:

[Click on thumbnail to see a large picture](#)



Q1: What is the most likely diagnosis?

- ☒ A. Viral rhinosinusitis
- ☐ B. Fungal sinusitis (non-invasive)
- ☐ C. Community acquired sinusitis
- ☐ D. Sinusitis of dental origin
- ☐ E. Sinus tumor

Q1:
A. Viral rhinosinusitis.

Viral rhinosinusitis is usually bilateral. In addition, it is usually preceded by a history of prior URI or allergy. It is uncommon to have a foul odor associated with the discharge. See the PowerPoint presentation on "[Causes of Acute Sinusitis](#)" on the [Acute Sinusitis](#) reference page for more on this topic and other infectious causes of sinusitis.

Teach the Key Concepts

- Numerous studies suggest learning **increases** when:
 - Key concepts are emphasized
 - Summarized information is superior for learning
 - Redundant information is reduced
 - Don't provide multiple references, sources, descriptions
 - Embellishments are reduced
 - Embellishments and extra details overload the learner

(Jensen, 2008; Mayer, 2011; Reder & Anderson, 1982)

Reinforce the Key Concepts

- Studies report learning **increases** when:
 - Key concepts are **reinforced** throughout:
 - Each learning experience (e.g., lecture, lab, etc.)
 - Longitudinally throughout a sequence of learning experiences (e.g., a course or curriculum)

(Jensen, 2008; Mayer, 2011; Reder & Anderson, 1982)

Time Out: A Thoughtful Review of the Literature

- Please read **HANDOUT 2** entitled, *“Effects of spacing and embellishment on memory for the main points of a text”* (Reder & Anderson, 1982).

Memory & Cognition
1982, Vol. 10 (2), 97-102

Effects of spacing and embellishment on memory for the main points of a text

LYNNE M. REDER and JOHN R. ANDERSON
Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213

An advantage has been found for acquiring textbook knowledge by studying textbook summaries rather than reading the original prose (Reder & Anderson, 1980). Three studies are presented that help to establish the cause of the summary advantage. One possible cause is that reading summaries allows the subject to reread the main points at spaced intervals, and spaced practice is superior to massed practice. A second possible cause is that the presence of details distracts the subject's attention away from the critical ideas that should be attended to. In Reder and Anderson (1980), these two factors were confounded, but they are unconfounded in the present studies. The results indicate that both possible causes, spaced practice and the absence of details, have significant, independent, and positive effects on retention of the central ideas of a passage.

This research is concerned with understanding some of the effects of details in a typical textbook format on learning from such a text. When one considers that college textbooks are hundreds of pages long and contain tens of thousands of facts, one cannot seriously expect a college student to master all the facts on all the pages. Given that mastery of all the ideas is not expected, what are students intended to learn and why are so many details included in the text?

Texts are intended to communicate a set of skills for reasoning and thinking cogently within the field. They include a large number of details to support the central ideas of the book. These details acquaint the student with the argument structure of the field. They may also persuade the student to believe the claims the text is making.

These potential functions of details do not address the issue of whether details support memory for the main points of a text. An important question is whether the inclusion of details is justified on the grounds of helping to retain the main points. One argument is that embellishments allow the reconstruction of the main points. Details imply the main points, although the converse is not true. The details, then, could allow the student to induce a central idea when it has been forgotten.

There are alternative arguments that can be made for why details should not support memory for the important ideas. Cognitive scientists (e.g., Crothers, 1972; Frederiksen, 1975; Kintsch, 1974; Kintsch &

van Dijk, 1975; Mandler & Johnson, 1977; Meyer, 1975; Rumelhart, 1975; Stein & Glenn, 1977; Thorndyke, 1977) have proposed theories of the structure of text that involve hierarchical representations of the idea units in the text, with the more important propositions represented higher in the hierarchy. The predominant notion is that one can access details only if one has first accessed the higher order ideas that subsume them. Thus, memory for main points is supposed to support memory for details, and not the converse. Indeed, investigations of these representations have found that propositions higher and more central in these hierarchies are better recalled, more accurately recognized, and more rapidly verified (e.g., Kintsch, 1974; Kintsch & van Dijk, 1975; Meyer, 1975). Of course, none of these results in and of themselves imply that details do not support memory for the main points.

A recent paper by Reder and Anderson (1980) investigated whether or not details benefit memory for the main points of a passage. Subjects read one passage in the original text form and a second passage in a summarized form. The summary form sacrificed all the redundancy and embellishments that come from the inclusion of details. The summaries were devised to retain the main points of the chapter, but not to save the paragraph style. One unembellished fact was listed per line.

To our surprise, all seven experiments indicated that subjects learn information better when they read an abridged or summarized version of the original text than when they read the original chapter. The advantages for summaries were maintained at retention intervals of 20 min, 1 week, and 6-12 months. Summaries were superior both for questions that directly tested assertions from the text and for inferences that required the subject to combine facts that had been studied. Subjects also learned new, related material better (regardless of

This research was supported by ONR Contract N00014-78-C-0725. Correspondence concerning this paper should be sent to Lynne M. Reder, Department of Psychology, Carnegie-Mellon University, Pittsburgh, Pennsylvania 15213. We wish to thank R. Adams, L. Hyatt, and L. Kronick for assistance in material construction and data collection.

Summary: Deepening Your Students' Learning

How to deepen learning:

- Focus on the essential information
- Don't overload the student with too much information
- Promote practice and review in the learning environment
- Students are more likely to retain learning when they have to reprocess the information

Memory & Cognition
1982, Vol. 10 (2), 97-102

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7) Small Group Discussion (15 min)

- How much gross anatomy is necessary for the under graduate medical student?
- What are the core concepts that all first-year medical students need to know?

Please access the University of Michigan Gross Anatomy website to use as a reference for your discussion:

http://www.med.umich.edu/lrc/coursepages/m1/anatomy2010/html/courseinfo/labs_systemic.html

Medical Gross Anatomy List of Dissections

Medical Gross Anatomy 2010/2011

Date

Topic

Musculoskeletal System I

08/30/2011	Dissection 1	Superficial Back	Team 1 & 2
09/08/2011	Dissection 2	Deep Back & Spinal Cord	Team 1
09/20/2011	Dissection 3	Pectoral Region, Posterior Shoulder & Breast	Team 2

Cardiovascular & Respiratory Systems

10/04/2011	Dissection 4	Thoracic Wall, Pleura, & Pericardium	Team 1
10/06/2011	Dissection 5	Heart	Team 2
10/18/2011	Dissection 6	Superior Mediastinum & Lungs	Team 1
10/20/2011	Dissection 7	Posterior Mediastinum	Team 2

Musculoskeletal System II

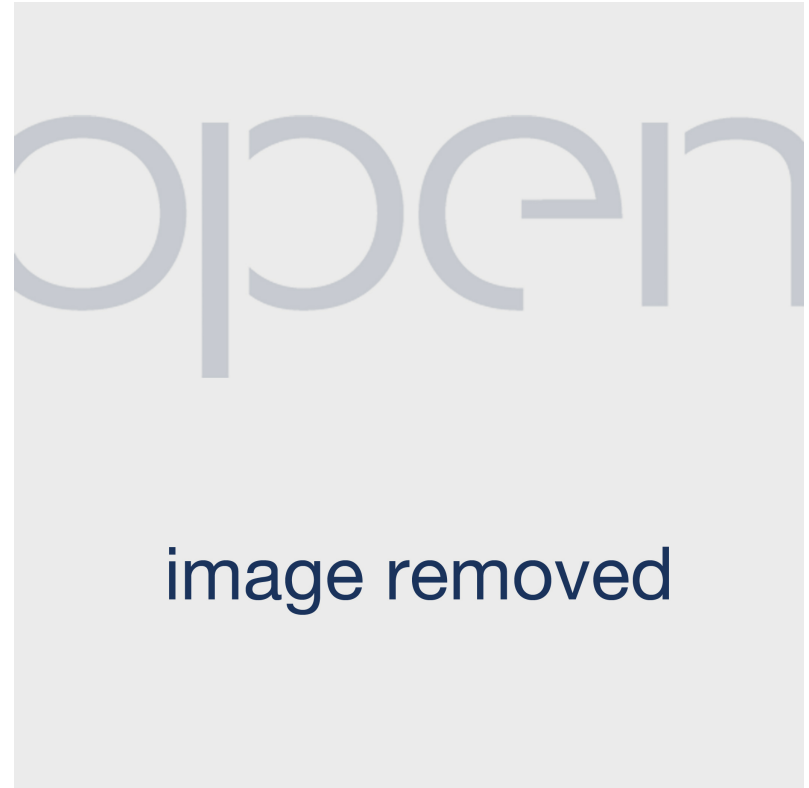
10/31/2011	Dissection 8	Overview/Organization of the Upper Limb	Team 1 & 2
11/02/2011	Dissection 9	Axilla, Arm, and Shoulder Joint	Team 2
11/03/2011	Dissection 10	Flexor compartment of the forearm, Superficial Hand, and Elbow joint	Team 1



http://www.med.umich.edu/lrc/coursepages/m1/anatomy2010/html/courseinfo/labs_systemic.html

8) Break (15 min)

- Bio-break (5 min)
- Light stretching and breathing (10 min)
 - Exercise improves mood and enhances cognitive abilities (Sousa, 2006)
 - Use the Russa Yog video to guide the activity
 - <http://russayog.com/media/videos/>

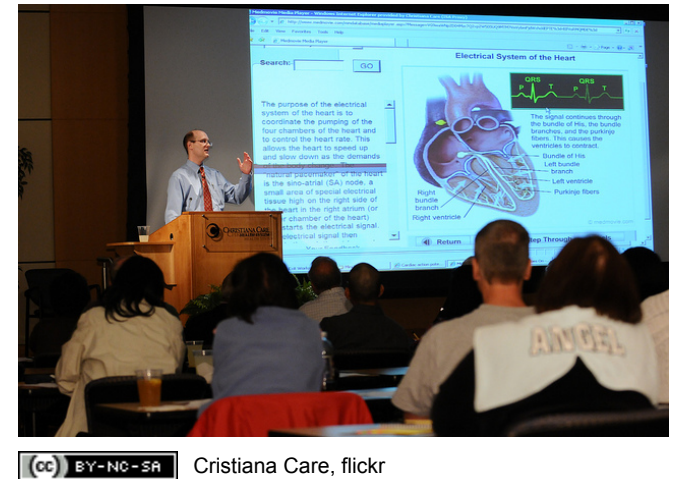


Please see original image of russa yoga screen shot at <http://russayog.com/media/videos/>

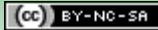
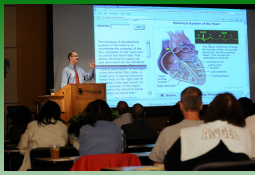
Russa Yoga video available at <http://russayog.com/media/videos/>

9) Improving Your Lectures, Pt. 1

- Move towards meaning making:
 - Organize information around clinical schema
 - Focus on key concepts (Reder & Anderson, 1982)
 - Remove embellishments (Reder & Anderson, 1982)
 - Use relevant pictures (Mayer, 2011)



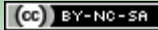
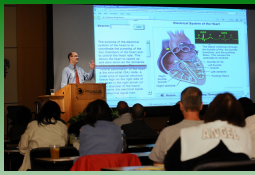
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Improving Your Lectures, Pt. 1 (cont.)

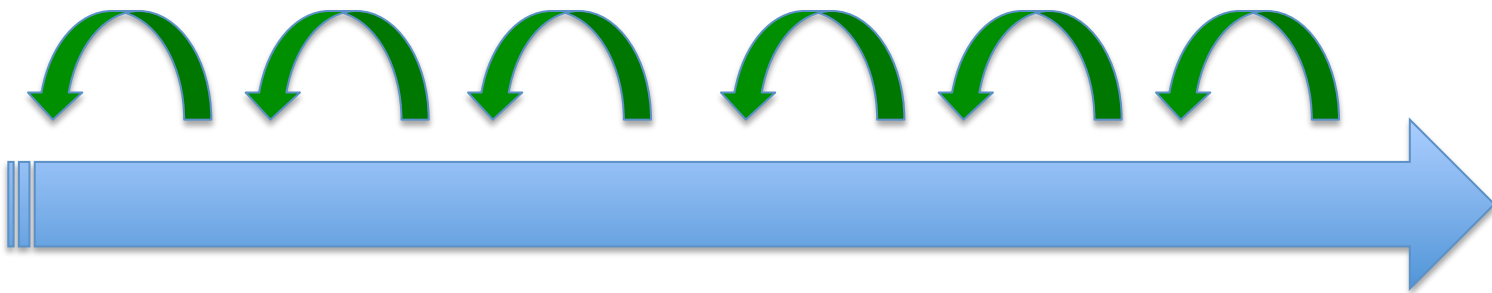
- Use polling and discussion to promote deep learning (more cognitive processing) in the learners
- Techniques:
 - Audience Response Systems
 - Hand raising
 - Paired or small group discussions



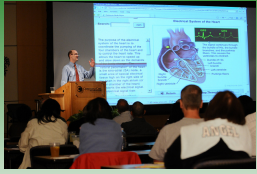
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Improving Your Lectures, Pt. 1 (cont.)

- Revisit and review information
 - In each lecture
 - Across lecture sequences



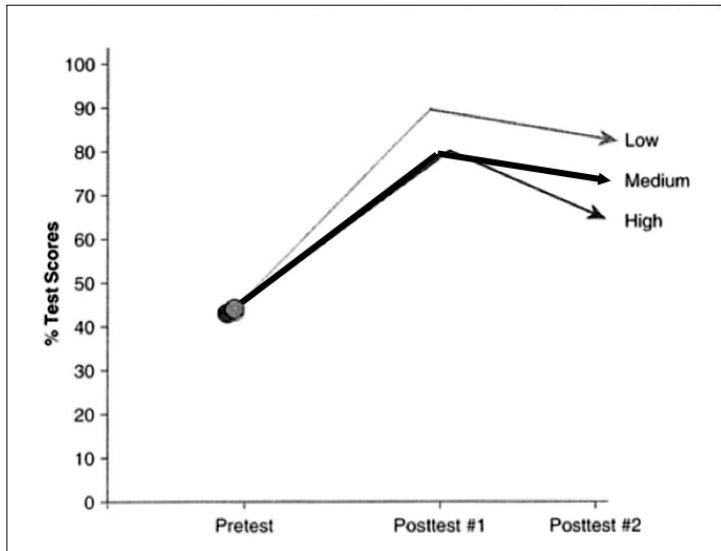
(Jensen, 2008; Mayer, 2011; Reder & Anderson, 1982)



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Reduce & Review Example

An example from a lecture series



Source Undetermined

From the Research: a cohort of students was divided into three groups. High received three lectures with 90% new material, medium with 70%, and low with 50%. Each group had the same amount of lecture time (low density lectures had more reinforcement time). Low density learners performed better on the Posttest 1 and Posttest 2 (15 days after the class) (Jensen, 2008).

10) Short Break (10 min)

- Break
- Modest amounts of fruit (because of the glucose) can improve attention and brain function (Sousa, 2006).
- Try fruit instead of coffee at the break and suggest it to your students and patients.



 msr, flickr



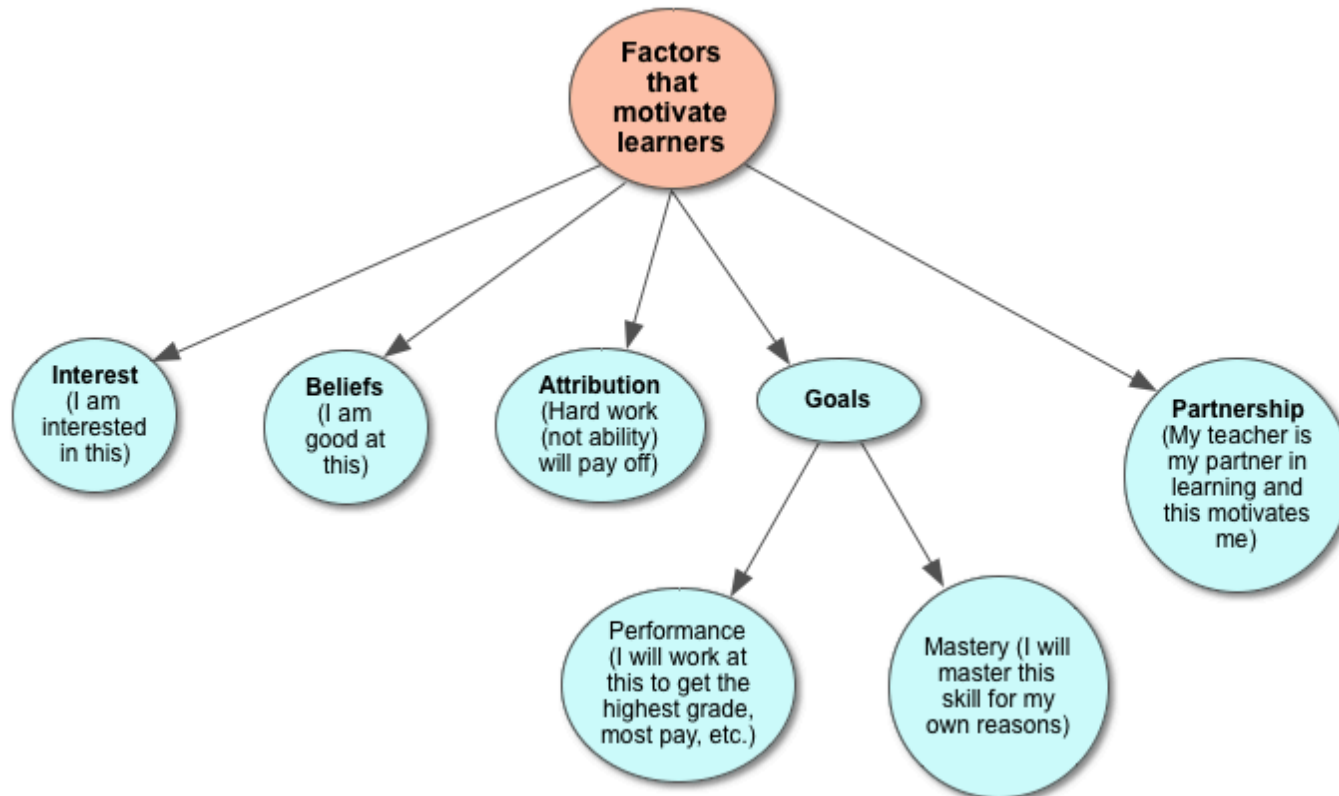
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11) Motivation and Learning

- There are two basic forms of motivation
 - Intrinsic (motivation that comes from within, does not depend on outside factors, is personal)
 - Extrinsic (motivation that comes from without, the desire to obtain something based on external factors)
- Motivational factors exist on a continuum, ranging from pure extrinsic to pure intrinsic, and in between

Motivation and Learning (cont.)

Another way to think of motivation is this **differentiated** motivational model (Mayer, 2011).

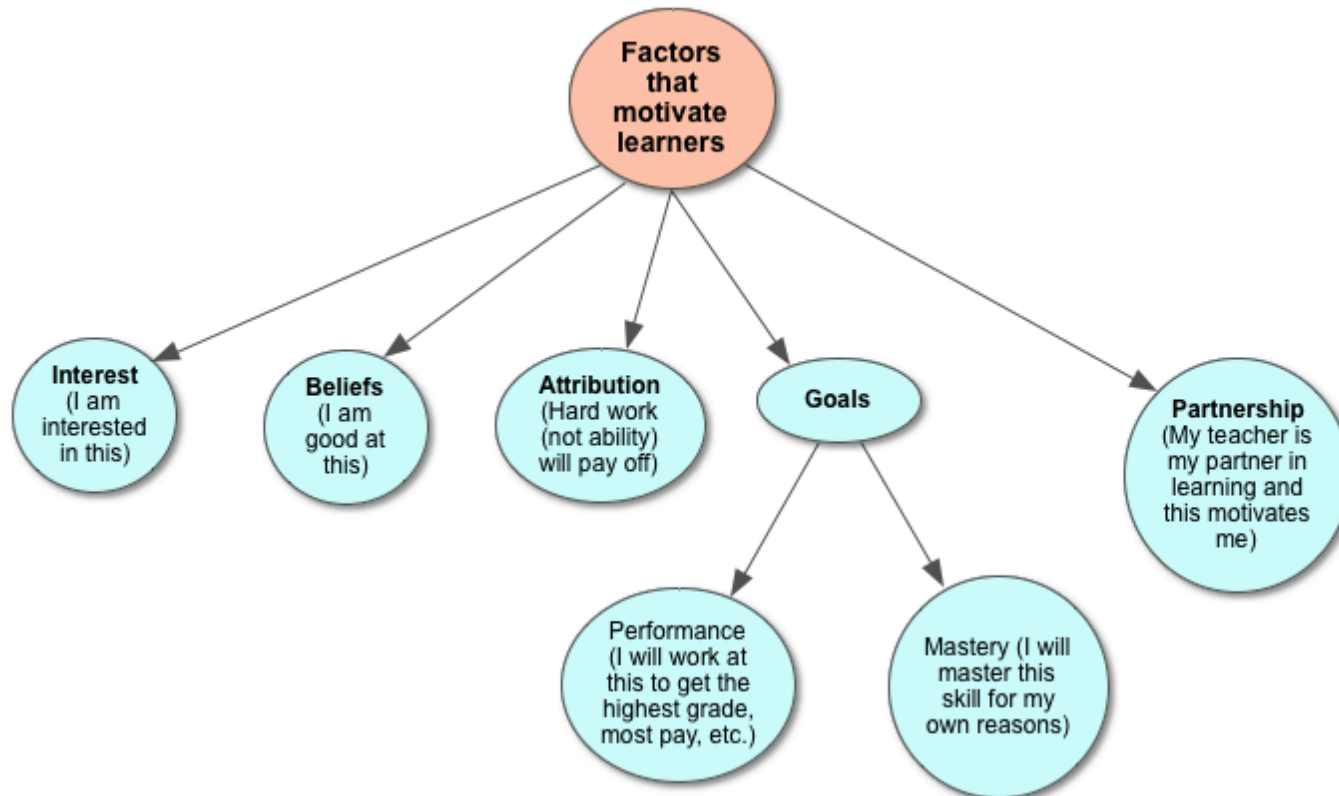


Motivation and Learning (cont.)

- It is assumed that Medical Students are highly motivated (otherwise they would not of been able to make it to medical school)
- However, as a teacher, you will come across students with different backgrounds and different motivations for studying medicine
- Understanding your own motivations and those of others may help you to empathize and guide your students

12: Paired Discussion: What Motivates You?

Use this **differentiated** motivational model by Mayer (2011) to work with your partner to explore the various facets of the motivational characteristics of your own professional life.





spcbrass, "Peanut Butter"

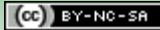
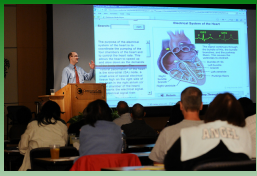
13) Lunch (45 min)

- Enjoy lunch
- We will watch this video by Daniel Pink entitled *"The Surprising truth about what motivates us"* (10:48)
- An informal discussion will follow



Please see original image of video screenshot at <http://www.youtube.com/watch?v=u6XAPnuFjJc>

"The Surprising truth about what motivates us" is available at <http://www.youtube.com/watch?v=u6XAPnuFjJc>



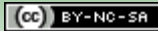
Cristiana Care, flickr

14) Improving Your Lectures, Pt. 2

- To help your learners retain what they are taught in a lecture:
 - Start and finish with the most important content
 - Prime-time-1 & Prime-time-2
 - Put the least important content in the middle
 - Down-time



(Sousa, 2006)



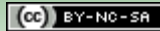
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Improving Your Lectures, Pt. 2 (cont.)

- Present new information at the beginning (Prime-time-1)
- Allow students to mentally reprocess (closure) the material at the end (Prime-time-2)
- Allow for practice, review, business, etc. in the middle (Down-time)



(Sousa, 2006)



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Improving Your Lectures, Pt. 2 (cont.)

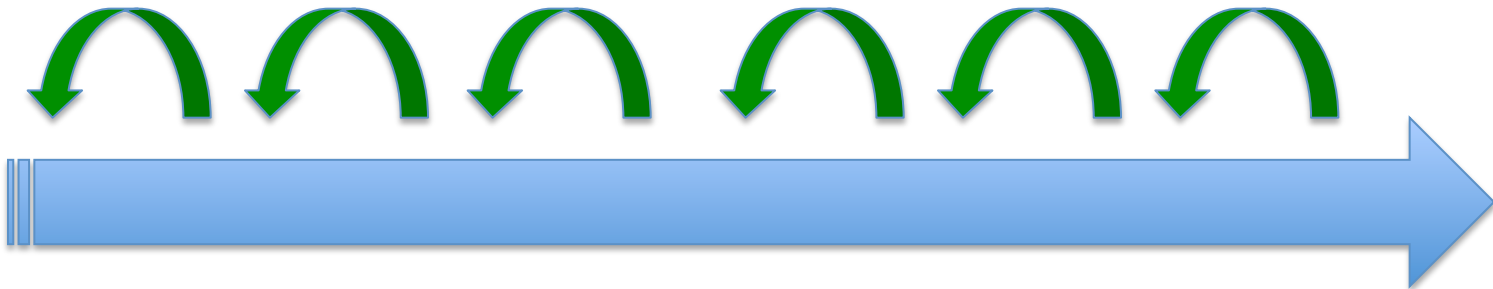
Consider segmenting your 50 minute lectures into two 20-25 minute lectures. Use the time between segments for business, humor, stretching, etc. This will result in more net-learning time (see table below).

Table 3.1 Average Prime- and Down-times in Learning Episodes

Episode Time	Prime-Times		Down-Time	
	Total Number of Minutes	Percentage of Total Time	Number of Minutes	Percentage of Total Time
20 minutes	18	90	2	10
40 minutes	30	75	10	25
80 minutes	50	62	30	38

15) Integrating Your Course

- Design your **course** so your students can master the key concepts
 - Identify the key concepts (Reder & Anderson, 1982)
 - Teach the key concepts
 - Resist the temptation to add unnecessary details (Reder & Anderson, 1982)
 - Tie the information to a clinical schema and the course themes
 - Actively revisit core concepts throughout each
 - lecture, small group, lab, etc. (Reder & Anderson, 1982)



Integrating Your Course

Relations among Instruction, Learning, and Assessment

What the instructor
does:

Manipulation

What goes on in the learner's mind:

Experience

Knowledge

What the learner
does:

Performance

Instruction: Manipulation causes experience

Learning: Experience causes knowledge

Assessment: Knowledge enables performance

As the course director, you can design the course experiences to focus on core concepts and intentionally revisit and review the core concepts.

16) Small Group Discussion (15 min)

- Does your course intentionally incorporate experiences to revisit core concepts?
- If so, how well?
- If not, how would you?

17) Small Group Success

- In some ways, small groups are like professional meetings
- Break into small groups and discuss the following question (15 min):
 - What are some of the frustrations that you have with your professional meetings (e.g., not always comfortable sharing, they are not productive, etc.)?

Small Group Success (cont.)

- Conditions for success in small group learning:
 - The structure should support cooperation AND collaboration
 - The meeting structure should easily encourage and solicit multiple perspectives
 - Decision making should be transparent
 - If part of a course, use the small group to revisit and reinforce key concepts taught in other parts of the course

Small Group Success (cont.)

Small group learning should support BOTH **cooperation** AND **collaboration**.
Note: cooperation & collaboration are often used synonymously BUT they actually two very different forms of interaction. See table below for a comparison.

Cooperation	Collaboration
Task based work	Roles change
Separate roles	Undefined goals
Structured tasks	Solutions negotiated by participants through communication
Specific end or goal	Open-ended questions/problems
Close-ended questions/problems	Can involve arguing, tension, etc. in the process
	(Egbert, 2009)

Small Group Success (cont.)

Small group learning should **encourage multiple perspectives**. There are many methods that can be used to support multiple perspectives in small groups.

Examples or process that support group creativity include:

- Brainstorming
- Group mind mapping
- Parallel thinking (Six Thinking Hats) (de Bono, 1999)

The goal of these processes is to allow multiple points of view and perspective to be shared in the group process with minimal restriction or censoring. This allows everyone to participate in the conversation and direction of the solution.

An especially powerful technique to promote group creativity is the Six Thinking Hats method. See the next slide for more information.

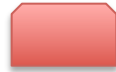
Small Group Success (cont.)

One method for developing the creative process of the individual or the group is to use the Six Thinking Hats method (de Bono, 1999).

In this method, students are asked to think in various ways. For your class, an activity is to simply ask students to “wear one of the hats” while describing their response to an idea or situation, or coming up with a new idea.

Using this method as part of group process is way to get many different points of view “on the table.”

If a decision is to be made, the “Blue Hat” is worn. See the next slide for more about decision making.



Six Thinking Hats (de Bono, 1999)

- Red hat (emotion): simply ask students to describe how they feel about the topic, idea, etc. without justification.
- Black hat (what’s wrong with the idea): ask students to provide reasons why an idea will not work.
- Yellow hat (what’s good about the idea): ask students to state positive possibilities or outcomes about an idea.
- White hat (the facts): ask students to list the facts and only the facts about the idea or topic.
- Green hat (out of the box): ask students to generate new ways of thinking about the idea without worrying about “practicalities.”
- Blue hat (decision time): ask students to make a decision or create a plan based on the ideas, thoughts, and feelings from the other hats.

Small Group Success (cont.)

When the group process must go beyond talking and a decision needs to be made, an explicit decision-making process should be enacted. See below for decision-making models.

Type	Description
Command	Group leader or other trusted individual makes final decision.
Consult	An external authority or expert in the field of interest evaluates the information generated by the group and makes the decision.
Vote	Use when there are several good options to choose from. Do not use if some group members will not support the final vote.
Consensus	Use with high stakes/complex issues or when everyone must support the final decision.
	(Patterson, Grenny, McMillian, & Switzler, 2002)


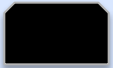


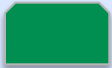

Small Group Success (cont.)

If the small group is part of a course, use the small group to review and revisit key component of the overall course. You can use synergy (people working and interacting together) to:

- Model behaviors
- Check for understanding
- Clarify misunderstanding
- Reinforce and build on key concepts

(Sousa, 2006)

Small Group Success (cont.)

- Small group discussion:
 - Think back to the “Six Hats” method. Which is your favorite hat to wear when participating in a discussion?      
 - Is cooperation really different than collaboration? Elaborate.
 - What are the pros and cons of using a vote to make a group decision?

18) Break (15 min)

- Bio-break (5 min)
- Light stretching and breathing (10 min)
 - Exercise improves mood and enhances cognitive abilities (Sousa, 2006)
 - Use the Russa Yog video to guide the activity
 - <http://russayog.com/media/videos/>



Please see original image of russa yoga screen shot at <http://russayog.com/media/videos/>

Russa Yoga video available at <http://russayog.com/media/videos/>

19) Moving Forward - Closure

Class Discussion – Let's Remember the Key Points with Reflection & Discussion

Part One

- Each person is to take five minutes, reflect upon what they learned today, and write down the one or two concepts you would like to apply to your teaching.

Part Two

- Each person shares with the group their key points.

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- Slides 7 & 14 (Butterfly Dreamer); Slide 9 & 10 (Chalkboard); Slides 9 & 16 (Puzzle Dreamer); Slide 10 (Scientist): Royalty free licensing from <http://www.dreamstime.com/>

Appendix A

- Handout 1: *A Closer Look at Active Teaching and Learning* (Mayer, 2011)

Appendix B

- Handout 2: *Effects of Spacing and Embellishment on Memory for the Main Points of a Text* (Reder & Anderson, 1982)