

The background of the slide is a dark blue field filled with a complex network of thin, curved lines in various colors including red, orange, yellow, green, and cyan. These lines originate from a central point at the bottom and fan outwards, creating a sense of dynamic movement and connectivity. Small dots of corresponding colors are scattered along these lines. A large, semi-transparent blue rectangle is positioned in the upper center, containing the main title. To the right of this rectangle, there is a white, cloud-like shape containing the subtitle. In the bottom left corner, there is a diagonal watermark.

# **TRAIN THE TRAINER**


## **DAY 7 & 8**

Brain Based  
Learning and  
Teaching (Training)

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<b>Day 7</b>
<b>09:00 How Well Did They Learn- Assessments &amp; Evaluations</b>
(Didactics)
<b>10:30 Break</b>
<b>11:00 Brain Based Learning</b>
Questioning skills
<b>12:30 Question Period</b>
<b>Day 8</b>
<b>09:00 Review</b>
<b>10:30 Break</b>
<b>11:00 The Quiz to Measure Our Success</b>
<b>12:30 Question Period</b>

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Inform  
Understand Reflect Improve  
Modify Authentic Purposeful  
Support Progress  
Relevant Meaningful Assessment Instruction  
Formative

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# **TRAIN THE TRAINER**

## **DAY 7 & 8**

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# The Difference Between Assessment and Evaluation

## The Difference Between Assessment and Evaluation

### What Is Teaching?

- Brainstorm:
  - Think of different ways to define "teaching".
  - Write down at least three different definitions of teaching.
  - Pair up with someone to choose the best ONE of your six-plus definitions.
  - Share your definitions with the group, one at a time in sequence.

### Definitions of Teaching

- To present information, insights.
- To reveal knowledge or skill.
- To help individuals learn.
- NOTE: All of the above can be accomplished either deliberately or incidentally.
- That is, you can teach by means of explicit instruction, ongoing guidance, deliberate modeling, or accidental example.

### Summary of Differences

Category of Difference	Assessment	Evaluation
Timing	Formative	Summative
Focus of Measurement	Learning process	Learning outcomes
Relationship Between Administrator & Recipient	Collaborative	Authoritative
Typical Activities in a Didactic Lesson	Teacher explains, Learner processes, Teacher and learner monitor progress	Teacher explains, Learner processes, Teacher and learner monitor progress

### Ways to Improve Teaching and Learning

- Implement research-based "best practices".
- Employ an assessment-informed model of teaching focused on measurable candidates learning outcomes.

### Good Practice in Education

1. Maximizes candidate/instructor contact.
2. Develops candidate cooperation.
3. Uses active learning techniques.
4. Gives feedback promptly.
5. Emphasizes time on task.
6. Communicates high expectations.
7. Respects learners' diversity.

### Assessment vs. Evaluation

- What are some of the differences between the two?

### Formative assessment

The goal of formative assessment is to monitor learning at the end of an instructional unit by comparing it against one standard or benchmark. Summative assessments are often high stakes, which means that they have a high-stakes value.

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### Examples of summative assessments include:

- A final exam
- A final project
- A written subject paper
- A practical demonstration of skills

Information from summative assessments can be used formatively when candidates or instructors use it to guide their efforts and activities in subsequent courses.

### Ways to Improve Teaching and Learning

- Implement research-based "best practices".
- Employ an assessment-informed model of teaching focused on measurable candidate learning outcomes.
- But first we need to distinguish "assessment" from "evaluation".

### Ways to Improve Teaching and Learning

- Implement research-based "best practices".
- Think of at least one way to implement each item of "practices".
- Write down each example.
- Pair up with the person next to you to choose the best example of each.
- Share your findings with the group.

### Sources

- Chickering & Gamson, *Classroom Assessment Techniques* (Jossey-Bass)
- Angelo & Cross, *Classroom Assessment Techniques: A Handbook for the First-Time Teacher* (Jossey-Bass)

### Four Assessment Principles

- To measure learning, instructors must define learning outcomes and measure them effectively.
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- To measure learning, instructors must define learning outcomes and measure them effectively.
- To measure learning, instructors must define learning outcomes and measure them effectively.

Thank You

### Key Point:

A didactic method is a teaching method that follows a systematic, scientific approach to education or training to engage the learner's mind.

Thank You

### Typical Activities in a Didactic Lesson

- Teacher explains
- Learner processes
- Teacher and learner monitor progress

### Didactic Lesson Structure

- Step 1: The Lesson
- Step 2: Lesson Objectives Shared
- Step 3: Teacher Input

### THE DIDACTIC TEACHING APPROACH

### The Didactic Approach

- Teacher's Role
- The Classroom
- The Instructor
- The Candidates

### The Didactic Classroom

- Teacher's Role
- The Classroom
- The Instructor
- The Candidates



## The Difference Between Assessment and Evaluation



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# What Is Teaching?

- Brainstorm:
  - Think of different ways to define “teaching”.
  - Write down at least three different definitions of teaching.



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## Ways to Improve Teaching and Learning

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## Good Practice in Education

- 1. Maximizes candidate/instructor
- 2. Develops candidate
- 3. Uses techniques.
- 4. Gives promptly.
- 5. Emphasizes on task.
- 6. Communicates high
- 7. Respects learners'

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# Ways to Improve Teaching and Learning

- Implement research-based “best practices”.

## Adult learning theory

- The andragogy model is based on several assumptions:
  - Adults have the need to know why they are learning something.
  - Adults have a need to be self-directed.
  - Adults bring more work-related experience into the learning situation.
  - Adults enter into a learning experience with a problem-centered approach to learning.
  - Adults are motivated to learn by both extrinsic and intrinsic motivators.

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## Ways to Improve Teaching and Learning

- Implement research-based “best practices”.
- Employ an assessment-informed model of teaching focused on measurable candidate learning outcomes.
  - But first we need to distinguish “assessment” from “evaluation”.

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# Assessment

VS.



# *Evaluation*

- What are some of the differences between the two?

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## Dimensions of Difference Between Assessment and Evaluation

- Timing
- Focus of Measurement
- Relationship Between Administrator & Recipient

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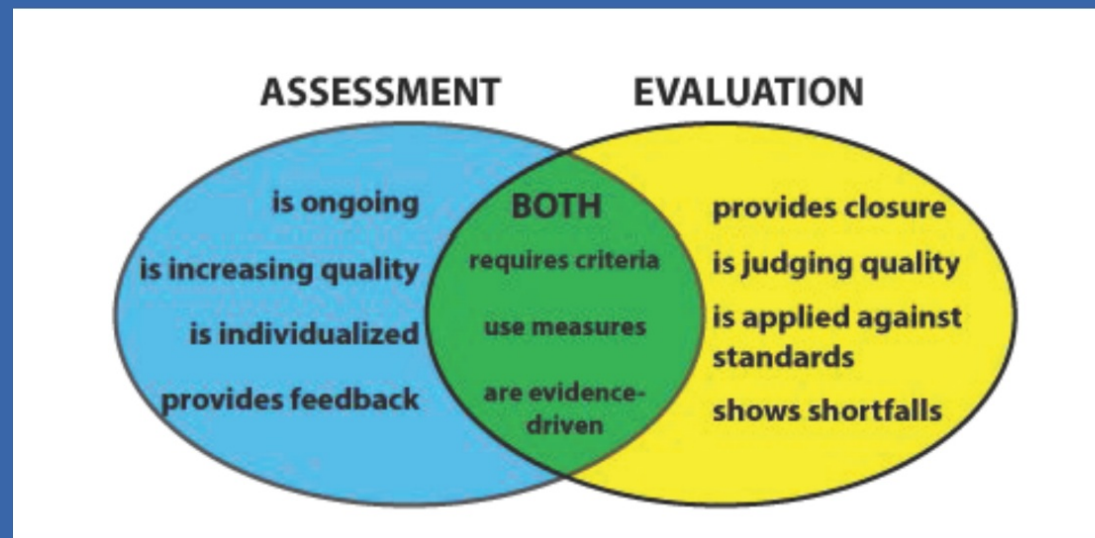
## Dimensions of Difference Between Assessment and Evaluation



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## Formative assessment

The goal of formative assessment is to *monitor learning* to provide ongoing feedback that can be used by instructors to improve their teaching and by the learners to improve their learning. More specifically, formative assessments:

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- help candidates identify their strengths and weaknesses and target areas that need work

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- help candidates identify their strengths and weaknesses and target areas that need work
- help training department to recognize where candidates are struggling and address problems immediately

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## Summative assessment

The goal of summative assessment is to *evaluate student learning* at the end of an instructional unit by comparing it against some standard or benchmark. Summative assessments are often *high stakes*, which means that they have a high point value.

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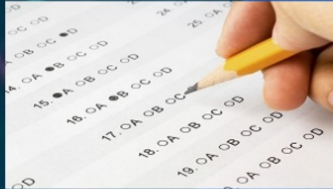


Examples of summative assessments include:

- a final exam
- a final project
- a written subject paper
- a practical demonstration of skills

Information from summative assessments can be used formatively when candidates or instructors use it to guide their efforts and activities in subsequent courses

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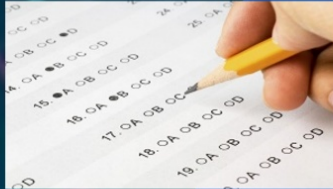
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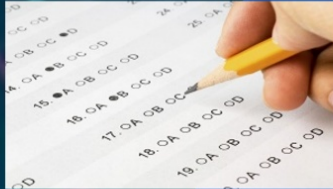
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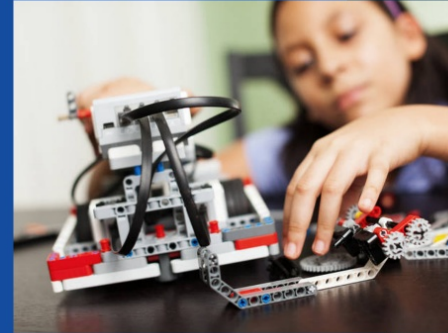
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## Summary of Differences

<u><i>Dimension of Difference</i></u>	<i>Assessment</i>	<i>Evaluation</i>
<u>Timing</u>	Formative	Summative
<u>Focus of Measurement</u>	Process-Oriented	Product-Oriented
<u>Relationship Between Administrator and Recipient</u>	Reflective	Prescriptive
<u>Findings, Uses Thereof</u>	Diagnostic	Judgmental
<u>Ongoing Modifiability of Criteria, Measures Thereof</u>	Flexible	Fixed
<u>Standards of Measurement</u>	Absolute	Comparative
<u>Relation Between Objects of A/E</u>	Coöperative	Competitive

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## Ways to Improve Teaching and Learning

- Implement research-based “best practices”.
  - Put the examples into practice.
- Employ an assessment-informed model of Instruction focused on measurable candidates learning outcomes.
  - How to do this?

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## Employ an assessment-informed model of teaching

- Define learning outcomes (desired by teachers and/or learners) well in advance.
- Assess progress toward outcomes, by and for both teacher and learner, continually during learning.
- Evaluate attainment of outcomes rigorously as each learning opportunity concludes.
  - Moment-by-moment, meeting-by-meeting, course-by-course.

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## Measures of Learning

- There are ways to measure learning with the aim of showing:
  - that any measurement of learning can be used either for assessment or for evaluation purposes,
  - but that some measures are better for one than for the other.

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## Ways to Improve Teaching and Learning

- Implement research-based “best practices”.
- Employ an assessment-informed model of teaching focused on measurable candidate learning outcomes.
- Be vocal about what you’re doing to improve your Instructional processes and your candidates’ learning. Share with other Instructors.

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## Four Assessment Principles

- Assessment is a continuous process that occurs throughout the learning experience.
- Assessment is used to measure student learning and to provide feedback to students and instructors.
- Assessment is used to evaluate the effectiveness of the curriculum and to make improvements.
- Assessment is used to ensure that students are meeting the learning objectives of the program.

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## Four Assessment Principles

- To improve their teaching, Instructors must define learning outcomes and measure their attainment.

■

■

■

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- To improve their teaching, Instructors must define learning outcomes and measure their attainment.
- To improve their learning, candidates must learn how to use feedback to assess their own progress (= "self-assessment").

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- To improve their teaching, Instructors must define learning outcomes and measure their attainment.
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- 

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## Four Assessment Principles

- To improve their teaching, Instructors must define learning outcomes and measure their attainment.
- To improve their learning, candidates must learn how to use feedback to assess their own progress (= "self-assessment").
- The best assessment derives from teachers' questions about their own teaching.
- Assessment provides an impetus for active student involvement, a proven "best practice".

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## Sources

- Chickering & Gamson, *Change* (for Higher Ed)
- Apple, *Process education teaching institute handbook* (Pacific Crest)
- Angelo & Cross, *Classroom assessment techniques: A handbook for Instructors*, Second edition (Jossey-Bass)

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Thank You

Capt Gabe

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# THE DIDACTIC TEACHING APPROACH

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# The Didactic Approach

## Didactic Teaching



The classroom

The Instructor

The candidates



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## The Didactic Classroom

What the Teacher Does	What the Students Do
Identifies desired learning outcomes and selects tasks accordingly	Follow the teacher's plan and do pre-selected tasks as required
Presents information	Read, watch or listen to new learning content
Models procedures or techniques	Observe and then copy or imitate
Orchestrates activities and manages behaviour	Do as told (or not)
Asks questions to check understanding and recall of information	Try to recall the information they received to answer questions
Selects assessment criteria and creates assessments to check understanding and recall	Prepare for assessment by revising previously learned, pre-selected information
Feeds results and comments on performance back to students (through marking or verbal comments)	Listen to or read feedback and (possibly) try again

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## Didactic Lesson Structure

### Step 1: The 'Hook'

The instructor/teacher evokes a stimulus of some type such as a story, an activity or a question designed to engage the candidates' attention and interest.

### Step 2: Lesson Objectives Shared

The teacher identifies the lesson objectives or outcomes and shows how these fit into the overall learning plan.

### Step 3: Teacher Input

The teacher provides necessary information, skills, procedures, etc.

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## Typical Activities in a Didactic Lesson

- Teacher explains
- Learner processes
- Teacher and learner monitor progress

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## Key Point:



A *didactic method* is a teaching method that follows a consistent scientific approach or educational style to engage the learner's mind.

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Thank You

Capt Gabe

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Train the Trainer

## Questioning Skills

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## Questioning Methods

Open / Close Questions

Probing Questions

Leading Questions

Inspiring Questions

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# USAGE

## Open / Close Questions

### Open Questions

- Demand as much information as possible
- Disguise what you are getting at

### Close Questions

- Want to get precise answer
- Want details
- Want commitment

Can I get details,  
Yes or No ?  
Can I get a  
commitment, Yes  
or No

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# HOW TO

## Open / Close Questions

Open

• Questions that start with

Why

What

Who

When

Where

How

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# HOW TO

## Open / Close Questions

### Close

- Questions that lead to a simple yes or no answer

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# EXAMPLES

## Open / Close Questions

### Open

- “What happened in the meeting?”
- “When is the delivery going to be made?”
- “Which areas need more attention?”

### Close

- “Do you need help?”
- “Can you send this report by tomorrow?”

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## Probing Questions

Find more details

Need clarification

Want to prevent misunderstanding

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# HOW TO

## Probing Questions

Use open question

Use “exactly” to add precision

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# EXAMPLES

## Probing Questions

“What do you need to make this project move forward?”

“When is it *exactly* going to be ready?”

“What *exactly* do you mean by unlimited usage?”

“What do you mean by, ‘no one showed up’?”

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**USGAE**

## Leading Questions

Want to lead the other person in a direction of your choice

Good for getting answers you want while allowing freedom of choice

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## HOW TO

### Leading Questions

Show personal preference

Phrase questions to get a "Yes"

Assume something as fact without questioning it

Give two choices preferred by you (i.e. no choice at all)

# EXAMPLES

## Leading Questions

Personal preference

- "I think it is a great colour, don't you think?"

Getting to Yes

- "Shall we all agree to this Action?"

Assume Facts

- "How bad was his speech?"

Choices

- "You can either get the advanced version at a cost, or get the simpler but cheaper version?"

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# USAGE

## Inspiring Questions

Useful for motivational speak

Good for coaching

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# HOW TO

## Inspiring Questions

“Would it not be [something positive]...”

“Isn't it [something positive]...”

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## Inspiring Questions

### EXAMPLES

“Would it not be wonderful if you could get a degree in this subject?”

“Isn’t this a lovely colour?”

“Doesn’t it fit beautifully?”

“Wouldn’t we love to be the market leader in this area?”

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## Use Silence

Ask and then WAIT.....

### Benefits

- Allow time to think and reflect
- Avoid talking too much and giving too much information which can confuse
- Use silence to put pressure on the other person to talk or give up information

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**Any questions or comments so far....?**

....Only 73 more slides to go !

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## Questions, Comments

- You are allowed to think, reflect, consider and then politely speak your mind, for it is the one personality trait that sets you apart from everyone else!
- Without it we would be programmable robots .....And how boring would that be....

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*Thank You*

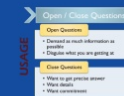
Captain Gabe Ascenzo

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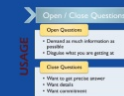
# LET'S REVIEW



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# What is the Definition of Training?



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# USAGE



## Open / Close Questions

### Open Questions

- Demand as much information as possible
- Disguise what you are getting at

### Close Questions

- Want to get precise answer
- Want details
- Want commitment

The Intent:  
Can I get details,  
Yes or No ?  
Can I get a  
commitment,  
Yes or No

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Training:

*WHAT IS IT ?*

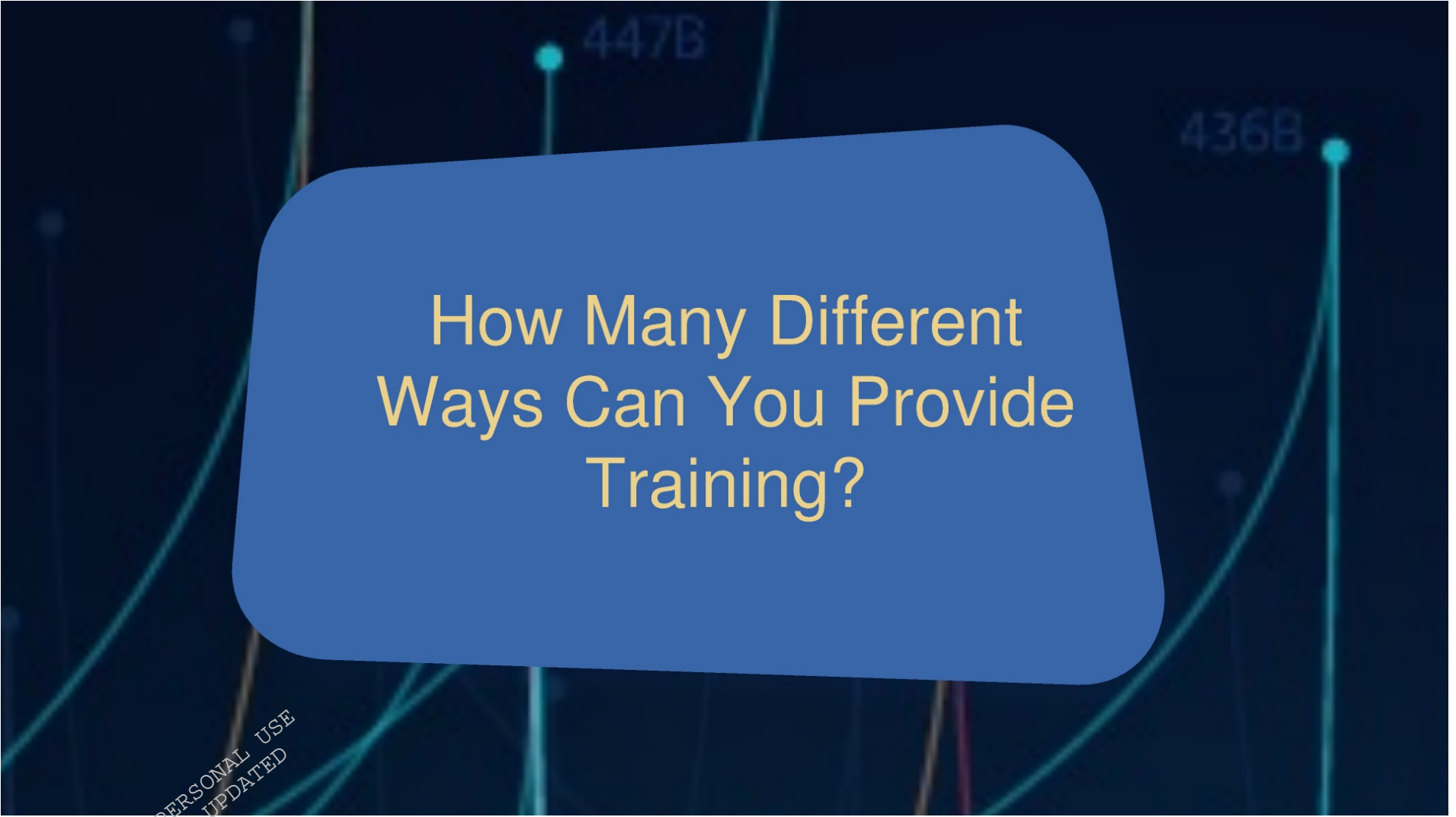
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## Training:

The successful transfer of appropriate information in an effective and time-efficient manner.

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How Many Different  
Ways Can You Provide  
Training?

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Training can be provided via:

**SO MANY  
WAYS...**

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## Training can be provided via:

- ✱ Newsletters
- ✱ In-depth documentation
- ✱ One-on-one sessions
- ✱ One-on-many classroom sessions
- ✱ Mentored self-coaching
- ✱ Computer-based training
- ✱ Brown-bag lunchtime sessions
- ✱ On-line help
- ✱ Video
- ✱ Audio

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# Pre-Planning

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## Define Your Goals

If you cannot define your goals, you cannot have a successful class.

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## Goals (cont.)

Goals help you decide:

- ✴ If you teach
- ✴ Who you teach
- ✴ What you teach
- ✴ How you teach
- ✴ Where you teach
- ✴ How long you teach

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## Goals (cont.)

My goals for this course:

In a classroom environment, and using a “coaching” style, familiarize candidates with:

- Adult education theory
- Pre-planning, planning and classroom issues, including goal and audience definition, mind mapping, course planning, suggestions for dealing with difficult students, helpful tools and concepts, and training tips and tricks.

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## Goals (cont.)

Finally, compare the course curriculum and the candidates results against your goals to find out how successful the class has been.

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## Goals (cont.)

If something needs to be changed,  
don't be afraid to do so. And, remember,  
sometimes it is the *goals* that  
need changing!

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## Define Your Audience

If you cannot define your audience, you have no way of knowing if you are teaching them what they need to know.

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## Define Your Audience (cont.)

Like defining your goals, defining your audience will help you decide:

- ✴ If you teach
- ✴ Who you teach
- ✴ What you teach
- ✴ How you teach
- ✴ Where you teach
- ✴ How long you teach

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## Define Your Audience (cont.)

Some questions you can ask yourself:

- Who should be in the class?
- How many people will be in the class?
- How do the people in the class relate to one another?
- How old are they?
- How much life experience do they have?
- How much business experience do they have?

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## Define Your Audience (cont.)

- ☀ Why will they be coming to class?
- ☀ What can I teach them that will help them in their specific jobs?
- ☀ What about this class needs to be unique to meet the needs of this particular group?

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## Define Your Audience (cont.)

My audience definition for this class:

- ✱ Young to middle-aged
- ✱ Some to extensive life experience
- ✱ Some to extensive practical experience
- ✱ Some to extensive business and career experience

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## Define Your Audience (cont.)

- Most likely have little to a medium “formal” amount of “teaching” training
- Most likely enthusiastic about the training and learning opportunities being offered them
- Most likely verbal, and willing to participate in open class discussion
- Technologically savvy

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## Define Your Audience (cont.)

- ✦ Audience exercise
- ✦ Goal and Audience discussion

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# Planning and Curriculum Development

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## **Adult Education and How Adults Learn**

It is important, over time, to learn about the different ways adults learn, and what motivates them.

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## Adult Education (cont.)

- ✱ Principles of adult learning
- ✱ Learning styles
- ✱ Resources

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## **An Important Rule of Thumb**

It can take up to 8 hours to develop  
1 hour of class curriculum!

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## Mind-Mapping

Mind-mapping is a way of freeing yourself from linear thinking and simply “dumping” your thoughts on paper without worrying about the weight or importance of any particular topic.

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## Mind-Mapping (cont.)

- ✦ Demonstration
- ✦ Handouts
- ✦ Exercise

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## The Five-Minute Rule

If you can't even begin to figure out where to start with your class curriculum, try applying the "Five Minute Rule."

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## Timing the Class

Use your class goals, what you know about your audience, and outline of topics to determine how long or short to make the class.

But...

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## Timing the Class (cont.)

...take into account all the “nickel and dime” events that will eat away at your class time.

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## Timing the Class (cont.)

“Nickel and dime events” can include:

- ✱ Breaks
- ✱ Questions
- ✱ Lunch
- ✱ Exercises
- ✱ Handouts
- ✱ Wrap-up/class evaluations
- ✱ Setup/breakdown/administration
- ✱ Equipment malfunctions

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## Your Outline

Make a detailed outline of everything that you plan on doing in class including:

- ✿ Administrative issues
- ✿ All topics and subtopics
- ✿ When you distribute handouts
- ✿ When you use exercises
- ✿ Questions
- ✿ Page number references
- ✿ New slides in presentation
- ✿ Anything else you can think of

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## Your Outline (cont.)

- Use a lot of white space for legibility.
- Use large fonts so you can read it from a few feet away.
- Make more than one and post them around the room.
- Use colors, italics, bolding different fonts to indicate questions, exercises, page number references, and so on.

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## Plan for the Worst

Take time to imagine what the worst things are that could happen in your class and **develop a solution**. Don't be caught unprepared!

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## The Classroom

- If possible, rearrange the training room in a way that reflects the type of training you are doing.
- Do a walk-through of the classroom at least one day before class.
- Make sure everything works the way it is supposed to (flipcharts, overhead, markers, projector, laptop, network connection).

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## The Classroom (cont.)

- ✴ Make sure you can see all the students.
- ✴ Make sure you can reach all of the students for one-on-one work.
- ✴ Sit in some of the students' desks and make sure they have a good view of you and the front of the room.

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## Rehearsal

Try to rehearse your class in its entirety at least once or twice before the first day of class, preferably in the actual room. You will be amazed at how many things you will have to change.

If necessary, remember to reserve the training room for this activity!

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# The Class

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## What to Wear

- ✴ Wear what gives you confidence in yourself and gives your students confidence in you.
- ✴ Wear layers.
- ✴ Wear comfortable shoes.
- ✴ Do not wear perfume or after shave.

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# How to Present

Teach with enthusiasm!

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## How to Present (cont.)

Own the room!

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## How to Present (cont.)

Do not be afraid of silences.

If you need to take time to look something up, do so.

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## How to Present (cont.)

Teach with PH&H.  
Patience,  
Humour &  
Humility

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## How to Present (cont.)

Teach from a place of empathy,  
not a place of authority  
or power.

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## How to Present (cont.)

Droning is deadly. Speak with a clear, projected, modulated voice.

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## How to Present (cont.)

Watch out for repetitive speech  
and gesture mannerisms.

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## How to Present (cont.)

Develop, and be comfortable with, a teaching “persona.”

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How to Present (cont.)

Variety, variety, variety!

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## How to Present (cont.)

Use anecdotes whenever possible.

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The background of the slide is a dark blue field filled with a complex network of thin, glowing lines in various colors including cyan, magenta, and gold. These lines intersect at various points, some of which are marked with small, solid dots of the same colors, creating a sense of a dynamic, interconnected system.

## How to Present (cont.)

Start asking questions of the students immediately. Engage them and acknowledge that they have something to contribute as soon as possible.

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## How to Present (cont.)

Don't just "give" all the information away; encourage students to participate by asking such questions as:

What should I do next?

What would happen if I made this selection?

If I selected this option, would that be wrong or right?

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## How to Present (cont.)

Use the “pigtail” method to drive home concepts.

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The background of the slide is a dark blue field filled with a complex network of thin, glowing lines in various colors including teal, orange, red, and yellow. These lines intersect and connect small, solid-colored dots of the same hues, creating a web-like or molecular structure. In the upper left corner, the text '361B' is faintly visible in a light blue font.

## How to Present (cont.)

Use mini-summaries to drive home concepts.

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## How to Present (cont.)

Meet known problems head-on  
and provide solutions.

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## How to Present (cont.)

Provide students with as many post-class resources as possible.

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## How to Present (cont.)

Provide plenty of breaks! You can't fight human physiology.

Follow all breaks with a little "pigtail" review.

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## How to Present (cont.)

Remember that a classroom is not a democracy. Always have your candidates' best interests at heart, but you need to maintain control at all times.

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## How to Present (cont.)

Develop an arsenal of techniques, concepts and phrases that you can call on when needed.

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## How to Present (cont.)

Be flexible!

Be prepared to abandon your plan and go off on a tangent.

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## How to Present (cont.)

No class will ever be perfect,  
but that's okay.

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# Final Thoughts

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# **TRAIN THE TRAINER**

## **DAY 7 & 8**


Brain Based  
Learning and  
Teaching (Training)

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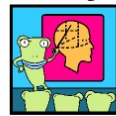


Learning is Developmental

Learning upon the topic some can think abstractly, while others have a limited understanding and are still struggling on a concrete level.




### Brain Based Learning and Teaching




#### The Brain is a Parallel Processor

- Both hemispheres work together
- Many functions occur simultaneously
- Edwards (1994) found when more neurons in the brain were firing at the same time, learning, meaning, and retention were greater for the learner.




#### Learning Engages the Entire Physiology

- Food, water, and nutrition are critical components of thinking.
- We are "holistic" learners - the body and mind interact.
- Neurons in the blood are channels of stress which can become the primary source of information transfer.




#### Parts of the Brain

- Brainstem (survival)
- Cerebellum (autonomic nervous system)
- Limbic system (emotion)
- Cortex (reason/logic)



#### Brain's Complexity

- Cellular level - three pints of liquid, three pounds of mass, tens of billions of nerve cells (or neurons), ten times more numerous glial cells that support, insulate and nourish the neurons
- Brain cells - 30 thousand neurons (300,000 glial cells) fit into the space of a pinhead.



# Brain Based Learning and Teaching (Training)


#### Before We Get Underway

- Caveat - Nothing is an absolute, but we are learning more and more every day about how the brain functions and how that translates to behavior - including teaching and learning.**
- WHAT DO YOU THINK?**
  - Can your brain grow new cells?
  - Does what you eat and drink affect your brain?
  - Do colors influence emotion?
  - Can knowledge of "brain-based" learning positively influence learning?
  - How are you already using brain based approaches to learning in your lessons?




#### Why Are You Here?

- What do you want to gain from this seminar?
- Why?
- What do you already know about brain based learning?




#### Our Brains

- Are like a "jungle" - working "rings" the jungle
- All parts of the brain participate with each other, with each having its own function
- There is natural growth and neural pruning that occurs when parts get not used this may be why we don't hear or see things over time
- "LEARNING IS PUBLIC, BUT IT IS A POWERFUL BECAUSE OF THE PRIVATE AND THE ENVIRONMENT..."




#### Twelve Basic Principles Related to Learning

- Brain is a parallel processor
- Learning engages the entire physiology
- Learning is developmental
- Each brain is unique
- Every brain processes and creates parts and whole simultaneously
- Learning always involves connections and reconstructive processes




#### Neurons

- Connect "other neurons" to process, or "glia"
- 7-10m and receive chemical information from other neurons
- 1-2m long or as long as a meter
- Cells help to contain DNA (in long a meter)




#### OBJECTIVES

- You may read and review some of the notes on research of brain-based learning and teaching.
- You will see a definition of the term "brain based learning."
- You will discuss practical implications of brain based learning.
- You will have some physiological information on the brain.




#### What is Brain Based Learning?

- Taking what we know about the brain, about development and about learning and combining those factors in intelligent ways to connect and excite students' desire to learn.
- Combining emotional, factual and skill knowledge into a cognitive tool.




#### How the Brain Determines What's Important

- Learning and retention are the primary processes of the brain
- Primary processes - motor responses
- Secondary processes - planning, problem-solving, decision-making, reasoning, memory, etc.
- Learning and retention are the primary processes of the brain
- Primary processes - motor responses
- Secondary processes - planning, problem-solving, decision-making, reasoning, memory, etc.



#### The Twelve Principles of Brain Based Teaching/Learning

- What are they?
- What do they mean?
- What are the implications of this information to working with teaching/understanding ourselves and others?



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**Brain-Based  
Learning**



**and  
Learning Theories**

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## Before We Get Underway

**Caveat -** *Nothing is an absolute, but we are learning more and more every day about how the brain functions and how that translates to behavior - including teaching and learning.*

### WHAT DO YOU THINK?

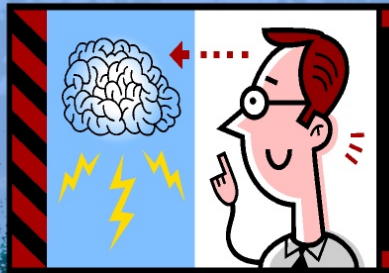
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## Why Are You Here?

- *What do you want to gain from this seminar?*
- *Why?*
- *What do you already know about brain based learning?*



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## OBJECTIVES



- **You may read and review some of the notes on research of brain-based learning and teaching.**
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- **You will discuss practical implications of brain based learning.**
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- Combining emotional, factual and skill knowledge into a cognitive tool.



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## Our Brains

- Are like a “jungle”- nothing “runs” the jungle
- All parts of the brain participate with each other, while each has its own function
- There is natural pruning or neural pruning that occurs when parts are not used (this may be why sounds not heard or used atrophy over time)
- **“LEARNING IS DELICATE, BUT IS A POWERFUL DIALOGUE BETWEEN GENETICS AND THE ENVIRONMENT...”**

Robert Sylwester, *A Celebration of Neurons*



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## Brain's Complexity

- **Cellular level** - three pints of liquid, three pounds of mass, tens of billions of nerve cells (or neurons), ten times more numerous glial cells that support, insulate and nourish the neurons
- **Brain cells** - 30 thousand neurons (300,000 glial cells) fit into the space of a pinhead.



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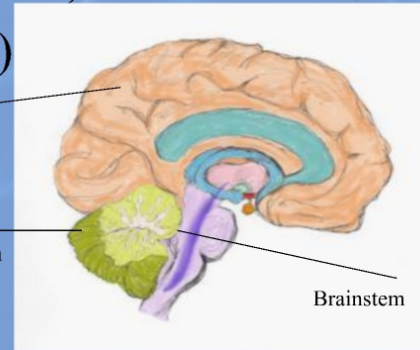
## Parts of the Brain

- **Brainstem** (survival )
- **Cerebellum** ( autonomic nervous system)
- **Limbic system** (emotion)
- **Cortex** ( reason/logic)

Cortex

Cerebellum

Brainstem

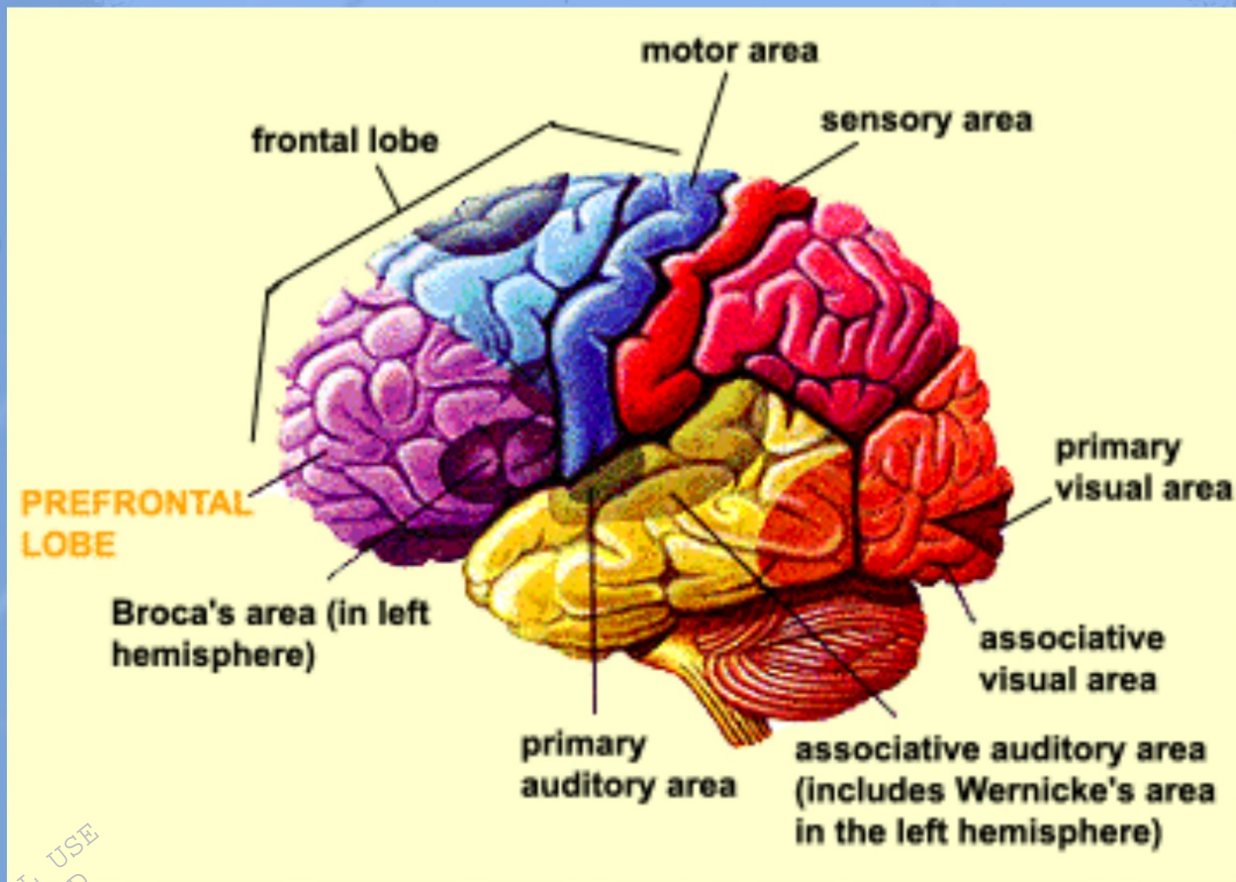


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- **Frontal lobe - Cortex**
  - Creativity      - Judgment      - Optimism      - Context
  - Planning- Problem solving      - Pattern making
- **Upper temporal lobe - Wernicke's Area**
  - Comprehension      - Relevancy      - Link to past (experience)      - Hearing      - Memory      - Meaning
- **Lower frontal lobe - Cortex**
  - Speaking/language      - Broca's area
- **Occipital lobe - Spatial order**
  - Visual processing      - Patterns      - Discovery
- **Parietal lobe**
  - Motor - Primary Sensory Area      - Insights      - Language functions
- **Cerebellum**
  - Motor/motion      - Novelty learning      - cognition      - balance      - posture



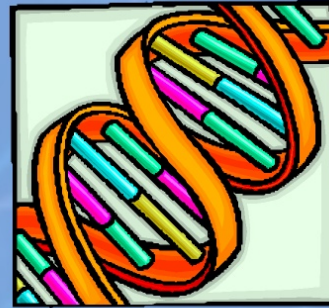
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## Neurons



- **Connect to other neurons, to muscles, or glands**
- **Send and receive chemical information (messages) for behaviors**
- **Can be a millimeter in length or as long as a meter**
- **Cells nucleus contains DNA (As long a meter)**

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- Neurons contain tubular extensions that are designed to communicate quickly with specific cells in the body network - this is a transportation system, much like a phone system.



- The brain has both **nerve cells** and **glial cells**. The neurons are cellular agents of cognition; the glial cells act as a scaffolding or insulation for impulses. (The insulation increases the speed of the neural (electrical) messages.)

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## How the Brain Determines What's Important



- **Emotion and attention are the PRINCIPAL processes of the brain**
  - **Primary emotions** - innate responses
    - Assemble life-saving behaviors quickly
  - **Secondary emotions** - also innate reactions
    - Enjoyment, pleasure
- **Students need to talk about their emotions**
  - Games, cooperative learning, field trips, interactive projects, use of humor
- **Limit emotional stress**

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## The Twelve Principles of Brain Based Teaching/Learning

- What are they?
- What do they mean?
- What are the *implications* of this information to working with/teaching/ understanding ourselves and others?



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## **Twelve Basic Principles Related to Learning**

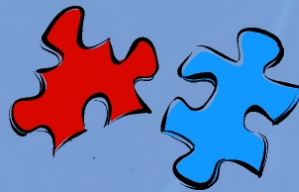
1. Brain is a parallel processor
2. Learning engages the entire physiology
3. Learning is developmental
4. Each brain is unique
5. Every brain perceives and creates parts and wholes simultaneously
6. Learning always involves conscious and unconscious processes



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7. The search for meaning is innate
8. Emotions are critical to learning
9. Learning is enhanced by challenge and inhibited by threat
10. The search for meaning occurs through patterning
11. We can organize memory in different ways
12. The brain is a social brain



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## The Brain is a Parallel Processor

- Both hemispheres work together
- Many functions occur simultaneously
- Edelman(1994) found when more neurons in the brain were firing at the same time, learning, meaning, and retention were greater for the learner.



1

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## Learning Engages the Entire Physiology

- Food, water, and nutrition are critical components of thinking.
- We are “holistic” learners - the body and mind interact
  - the peptides in the blood are
  - chains of amino acids that
  - become the primary source of
  - information transfer.



2

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## Learning is Developmental

- Depending upon the topic some Learners can think abstractly, while others have a limited background and are still thinking on a concrete level.



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# Learning is Developmental

- Building the necessary neural connections by exposure, repetition, and practice is important to the Learner.

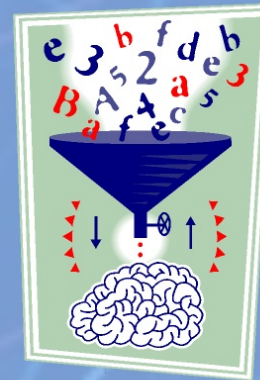


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## Each Brain is Unique

- We are products of genetics and experience
- The brain works better when facts and skills are embedded in real experiences.



4

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## Each Brain Perceives and Creates Parts and Wholes Simultaneously

- Some think more easily inductively while others find deductive thinking more comfortable - use both
- Shank (1990) Telling stories is one of the most influential techniques because you give the information, ground the meaning in structure, provide for emotion, and make the content meaningful. Our brain loves storytelling.
  - How might you make use of this?



5

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## Learning Involves Conscious and Unconscious Processes

- The brain and body learn physically, mentally, and affectively



- Body language as well as actual language communicate

6

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## Learning Involves Conscious and Unconscious Processes



- How you treat students and how you permit them to treat each other makes a difference in their learning and desire to learn.
- How the physical environment is organized makes a difference.

6

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## The Search for Meaning Is Innate

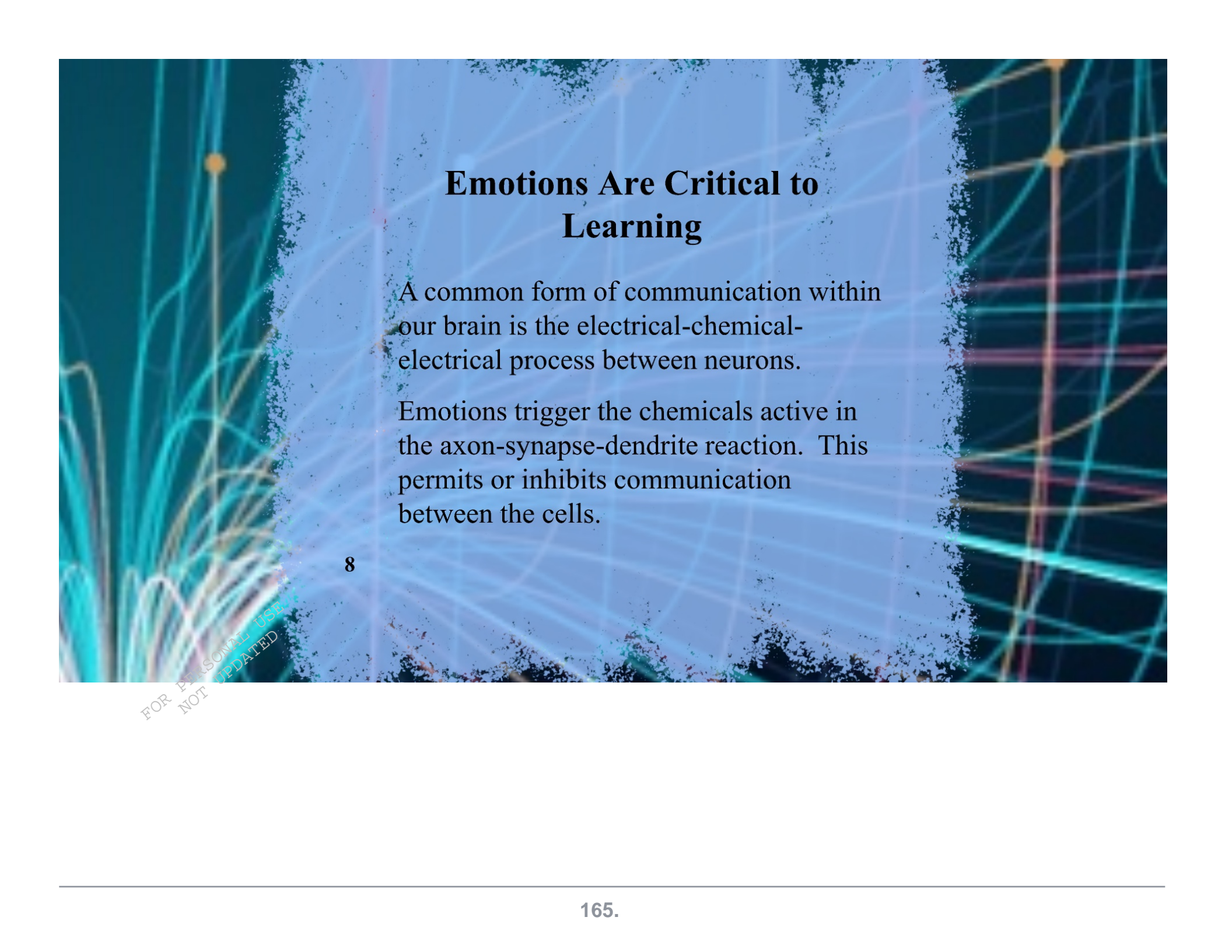
- Each person seeks to make sense out of what he/she sees or hears
- Capitalize on this quality!
  - Present ideas, experiences that may NOT follow what one expects:
    - Speculate
    - Question
    - Experiment
    - Hypothesize



7

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## Emotions Are Critical to Learning

A common form of communication within our brain is the electrical-chemical-electrical process between neurons.

Emotions trigger the chemicals active in the axon-synapse-dendrite reaction. This permits or inhibits communication between the cells.

8

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## Emotions Are Critical to Learning

90% of the communication is carried out by peptides (which are strings of amino acids that travel the blood stream and permit information transfer. Peptides are the glue that connect the body and the brain.

Learning is affected by emotions.

8

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## Learning is Enhanced by Challenge and Inhibited by Threat

- The brain's priority is always survival - at the expense of higher order thinking
- Stress should be kept to a manageable level
- Provide opportunities to “grow” and to make changes
- Have high, but reasonable expectations

9



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## The Search for Meaning Comes Through Patterning

- Tie learning to prior knowledge
- Use Know - Want to know - Learned cycle
- Bain (*What the Best College Teachers Do*) suggests working from “big” questions to be answered.

10



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## Brain Organizes Memory In Different Ways

- Retrieval often depends upon how the information was stored.
- Relevancy is one key to both storage and retrieval
- Connect to what students know, what they are interested in
- Provide and get examples
- Student talk!!!
  - Of varying types

11



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# Memory

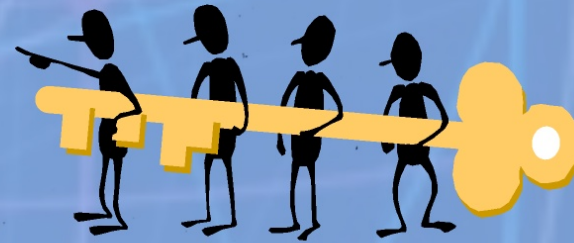
- **Short-term memory**

- **TO HELP:**

- Combine, or “**chunk**”
    - Recognition

- **Long-term memory**

- **Declarative** - Factual
  - **Episodic** - Events or experiences
  - **Semantic** - Words
  - **Procedural** - Step by step



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# Memory

- When objects and events are registered by several senses, they can be stored in several interrelated memory networks.
- This type of memory becomes more accessible and powerful.
- Conversation helps us link ideas/thoughts to our own related memories. Students need time for this to happen!!
  - Storytelling
  - Debates
  - Simulations
  - Games
  - Conversations
  - Role playing
  - Songs
  - Films



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# Techniques to Help Memory

- Define the “gist” -  
**OVERVIEW**
- **Sequence** events
- Plot out **pictorially** the information
- Tell the information to others in own words - **TALK**
  - Peer teaching/tutoring



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## Techniques to Help Memory

- Amplify by giving **examples**
- Use multiple parts of the brain (emotional, factual, physical)
  - Auditory, Visual, Kinesthetic, Talk
  - Combine
- Use **color** effectively
  - Yellow and orange as attention-getters



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## The Brain is a Social Brain

- **The brain develops better in concert with others**
  - When Learners have to talk to others about information, they retain the information longer and more efficiently!
  - Make use of small groups, discussions, teams, pairings, and question and answer situations.



12

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## How Might Brain-Based Research Influence Your Teaching?

- What changes might you make?
- What are you already doing that fits the research?
- What would you like to know more about?



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NOT UPDATED



The background of the slide is a dark blue field filled with a complex network of thin, glowing lines in various colors including cyan, orange, red, and white. These lines radiate from a central point at the bottom, creating a sense of dynamic energy and connectivity. Small dots of corresponding colors are scattered along the lines and throughout the background.

# **TRAIN THE TRAINER**

## **DAY 7 & 8**

Brain Based  
Learning and  
Teaching (Training)

FOR PERSONAL USE  
NOT UPDATED