

Learning Through Movement: Physical Activity & Academic Performance

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A Sound Mind in A Sound Body?

○ ***Juvenal:***

- > Ancient Roman poet who coined the phrase “a sound mind in a sound body” to summarize what he believed to be an important link between exercise and cognitive health.

A Sound Body?

- ***Physical Activity and Childhood Obesity***
 - Only 34% of youth currently perform physical activity meeting recommended guidelines.
 - 60 minutes per day on most days of the week.
 - Over 23 million kids (over 1/3 of the youth population) are classified as overweight or obese.
 - Daily Physical Education Classes:
 - 3.8% of elementary schools
 - 7.9% of middle schools
 - 2.1 % of high schools

A Sound Body?

- ***Physical Activity and Childhood Obesity***
 - Elimination of Recess in Elementary Schools
 - Children born in the United States have a shorter predicted life span than their parents for the first time in our history.

A Sound Mind?

**TIMMS Report -Trends in
International Mathematics
and Science Study (NCES,
2008):**

> 1999:

- 19th in Mathematics Achievement
- 18th in Science Achievement

> 2008

- 37th in Mathematics Achievement
- 35th in Science Achievement

Rubbery Blubbery Myth # 1: Cut Physical Activity and Physical Education to Allow Greater Instructional Time for Tested Areas

Physical Education & Physical Activity Programs Do Not Adversely Affect Academic Performance:

- > Sacrificing Physical Education for classroom time does not improve academic performance.
- > Students enrolled in Physical Education perform at the same level academically with those without the program.
- > Programs that doubled and tripled Physical Education did not effect academic performance but improved performance in most areas.

Rubbery Blubbery Myth # 2: Physical Activity and Physical Education Do Not Effect Academic Performance

◎ Kids who are more physically active perform better academically:

- > Eleven large scale studies have shown regular performance of physical activity is associated with improved academic performance.
- > United States, United Kingdom, Hong Kong and Australia in large national samples have shown students who regularly participate in recommended amounts of physical activity perform better in other academic classes.
- > Investigations of elementary through high school aged students in Australia, Korea and the United States have all shown students with higher scores of physical fitness have higher levels of academic performance as well.

Physical Education, Activity and Academic Achievement

● *Effect of Physical Education and Activity on Academic Achievement in Children (Coe et al 2006):*

- Middle school students who completed vigorous physical activity the recommended 3 days per week for 20 minutes showed higher grade achievement in English, Math, Science and World Studies Courses.

Physical Education, Activity and Academic Achievement

● Effects of Aerobic Exercise on Overweight Children's Cognitive Functioning (Davis, et al, 2007):

- > Elementary aged students who were classified as overweight completed a 10-15 week fitness program***
- > Results indicated not only an increase in fitness levels, weight loss but an increase in cognitive functioning .***

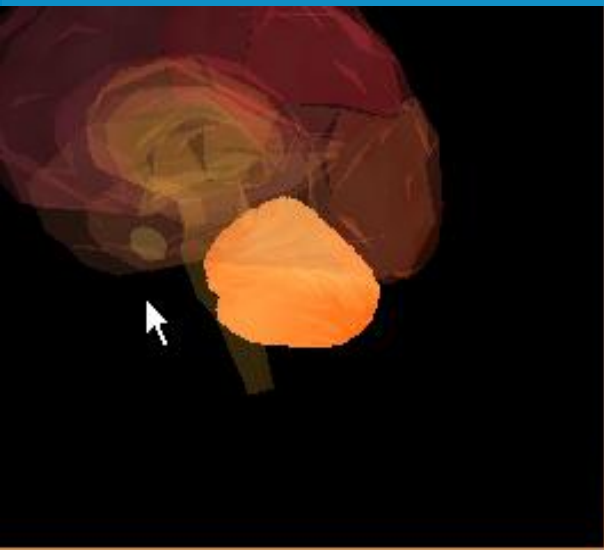
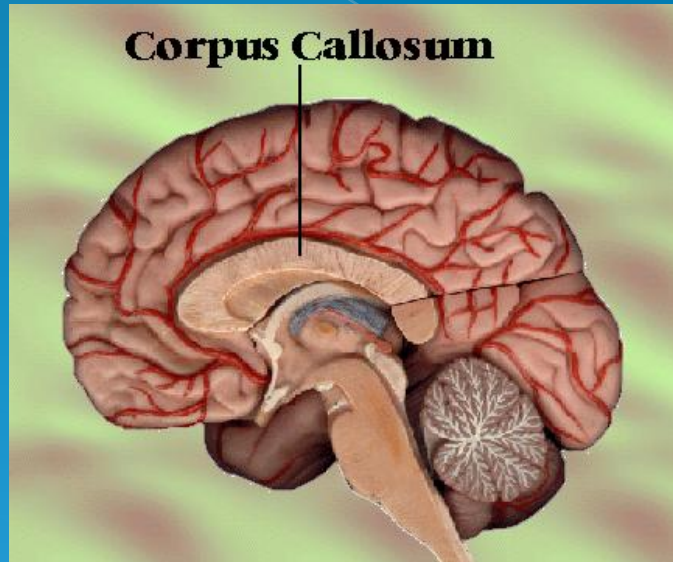
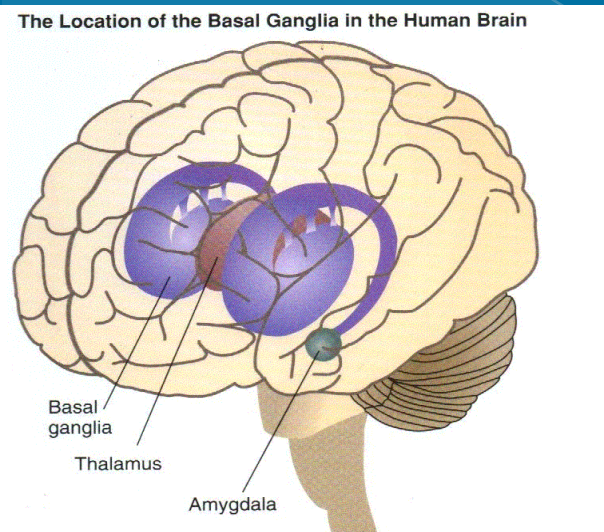
Physical Education, Activity and Academic Achievement

- ***Physical Fitness and Academic Achievement in third and fifth grade students (Castelli, et al, 2007):***
 - Students who scored higher on the Fitness gram physical fitness tests had higher scores on state standardized tests as well.
- ***Physical Fitness and Academic Achievement (Grissom, 2005):***
 - 884,715 students in 5th, 7th & 9th grade
 - As fitness levels improved achievement scores on state standardized tests improved as well.

Physical Education, Activity and Brain Development

Physical Activity and the Brain:

- > Physical activity strengthens key areas related to cognitive function in the brain, and the brains and ability to communicate and transfer information
 - Basal Ganglia
 - Cerebellum
 - Corpus Callosum



Physical Education, Activity and Brain Development

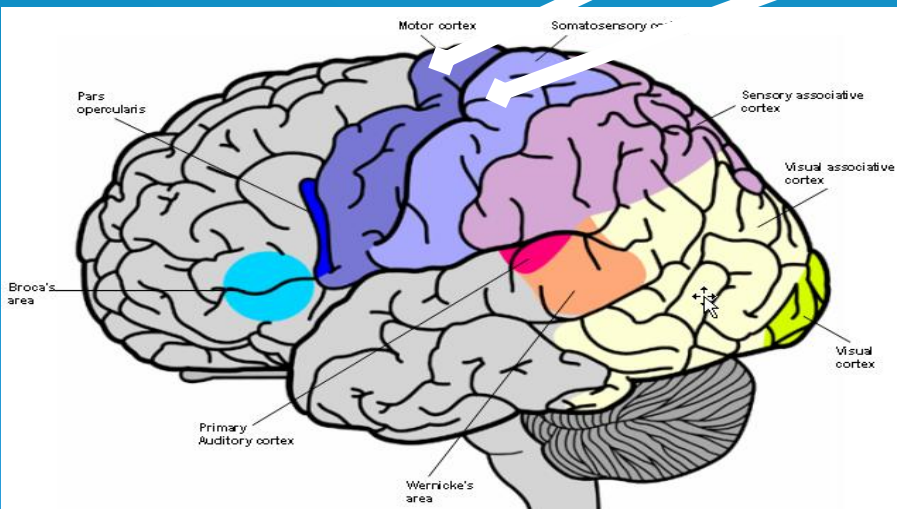


Parietal Lobe:

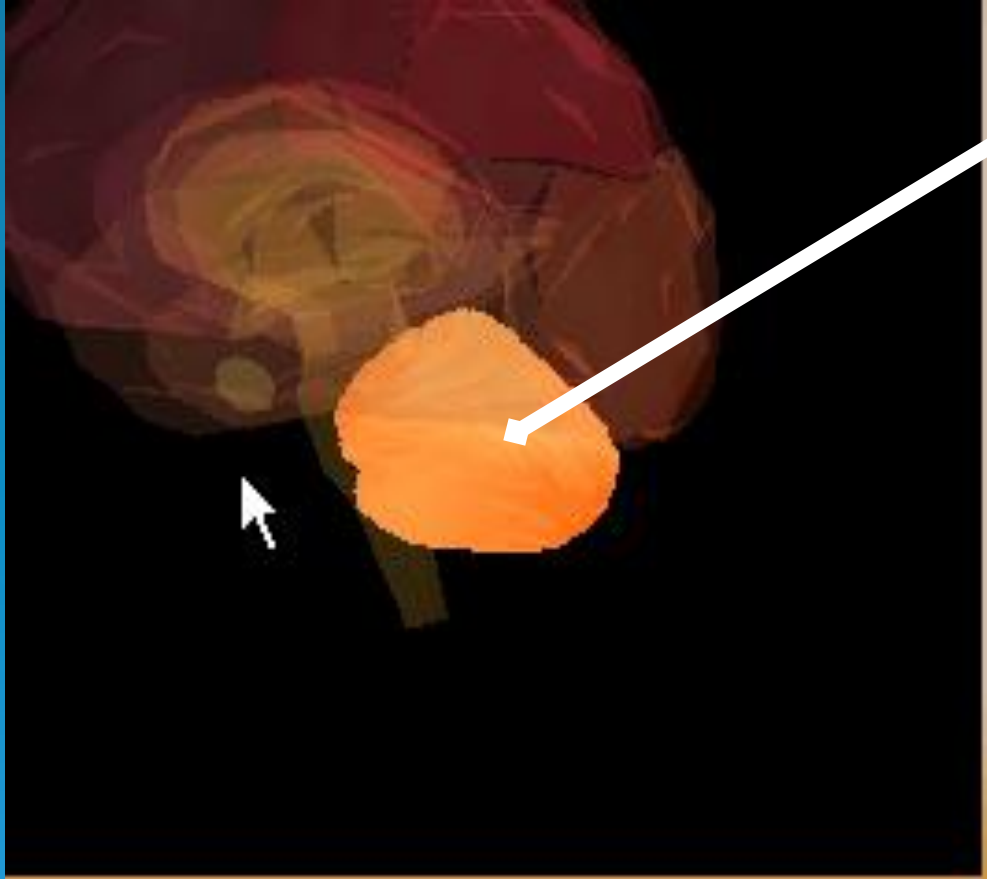
Pre-motor area

Primary Motor Area

- Information Processing
- Memory
- Language functions



Physical Education, Activity and Brain Development

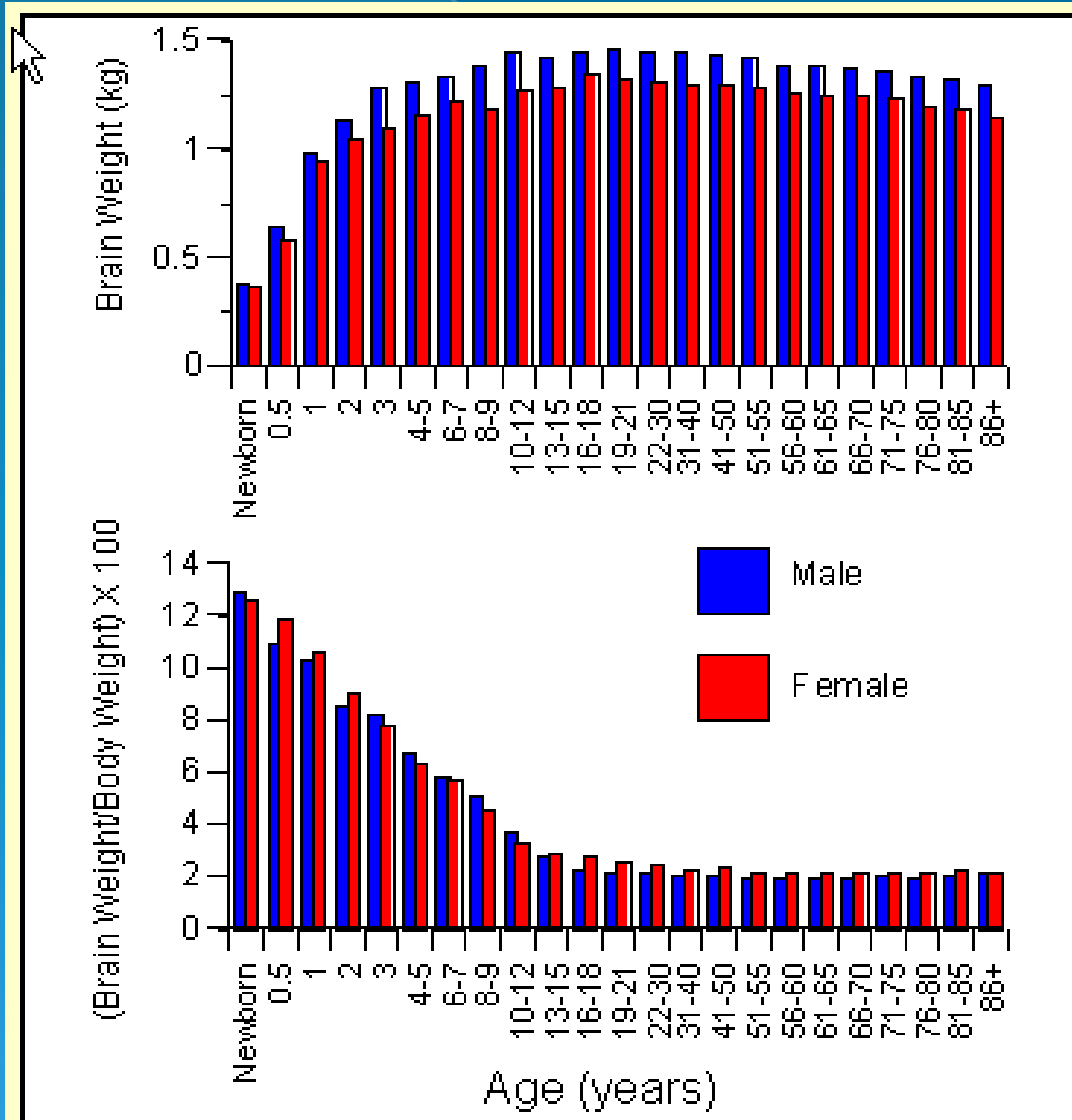


Cerebellum:

– Coordinates key skills for movement:

- Balance.
- Posture.
- Keeping the Body in an Upright Position.
- Speed, Direction, Force.
- Steadiness of Voluntary Motion.
- Memories of motor skills.

Physical Education, Activity and Brain Development

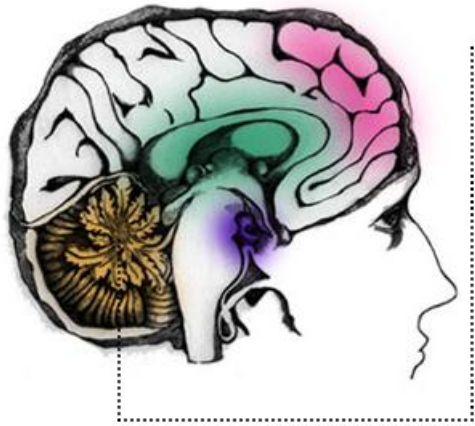


- The most active periods of brain growth and reorganization take place in the first two years of life.
 - The brain grows by expanding connections between brain cells (neurons).

Physical Education, Activity and Brain Development

Anatomy of a Teen Brain

Roll over a part of the brain for more information.



Cerebellum

This part of the brain has long been thought to be involved with the coordination of muscles and physical movement. Recently, scientists have come to believe that it is involved in the coordination of thinking processes, as well. New research has shown that it is an area that undergoes dynamic growth and change during the teenage years.

Anatomy of a Teen Brain

Roll over a part of the brain for more information.



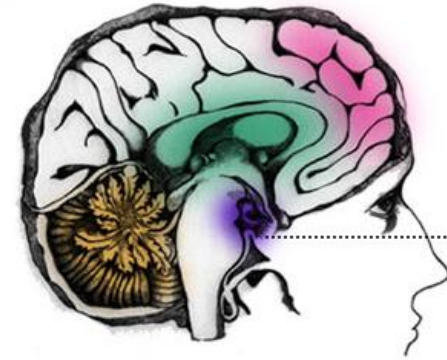
Frontal Cortex

The frontal cortex is often referred to as the "CEO" of the brain, because it is the part responsible for planning, strategizing, and judgment. Recent research has shown that this area undergoes a growth spurt at around the ages of 11-12, followed by a period of pruning and organizing of the new neural connections during the teen years.

There Brains are Broken!!!

Anatomy of a Teen Brain

Roll over a part of the brain for more information.

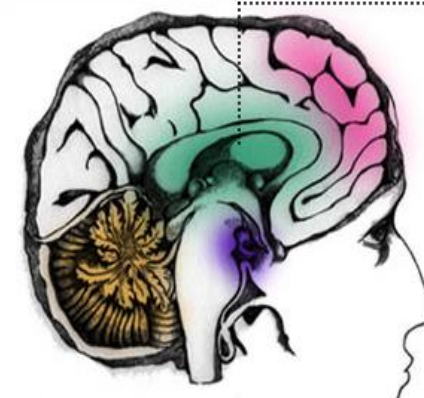


Amygdala

This area of the brain is associated with emotional and gut responses. New imaging studies suggest that teenagers, when asked to interpret emotional information, use this reactive part of the brain rather than the more "thinking" region, the frontal cortex, while adults rely more heavily on the frontal cortex. Scientists speculate that this may be why teens have trouble modulating their emotional responses.

Anatomy of a Teen Brain

Roll over a part of the brain for more information.



Corpus Callosum

This is a cable of nerves that connects the two hemispheres of the brain, and is believed to be involved in creativity and problem solving. It appears to change and grow significantly through adolescence.

A Day in the Life of a Child

Math

Language Arts

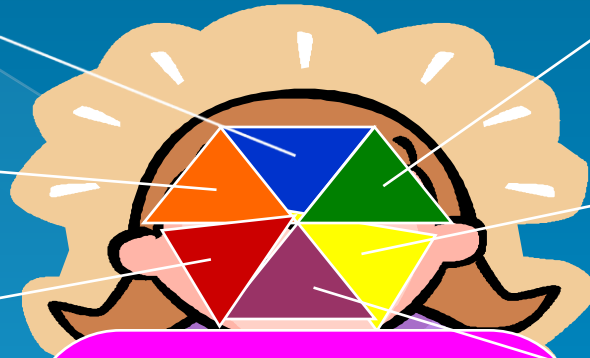
Science

Reading

Social
Studies

Physical
Education

Art, Music,
Technology, Library,
Counseling



A Day in the Life of a Child

Visual: Learn
by seeing,
experiencing
and observing

Auditory: Learn
by hearing and
listening to
information



Kinesthetic:
Learn by doing,
moving,
manipulating
objects.

Integrated Thematic Instruction

Body Brain Learning Components:

- Absence of Threat
- Enriched Environment
- Meaningful Content
- Collaboration
- Choices
- Immediate Feedback
- Adequate Time
- Mastery/Application
- Movement to Enhance Learning

Why Incorporate Movement in the Classroom?



Lecture-5%

Reading-10%

Audio-Visual-20%

Demonstration-30%

Discussion Group-50%

Practice by Doing-75%

Teach Others-90%

Why Use Movement in The Classroom?

On a sheet of paper number one through eight

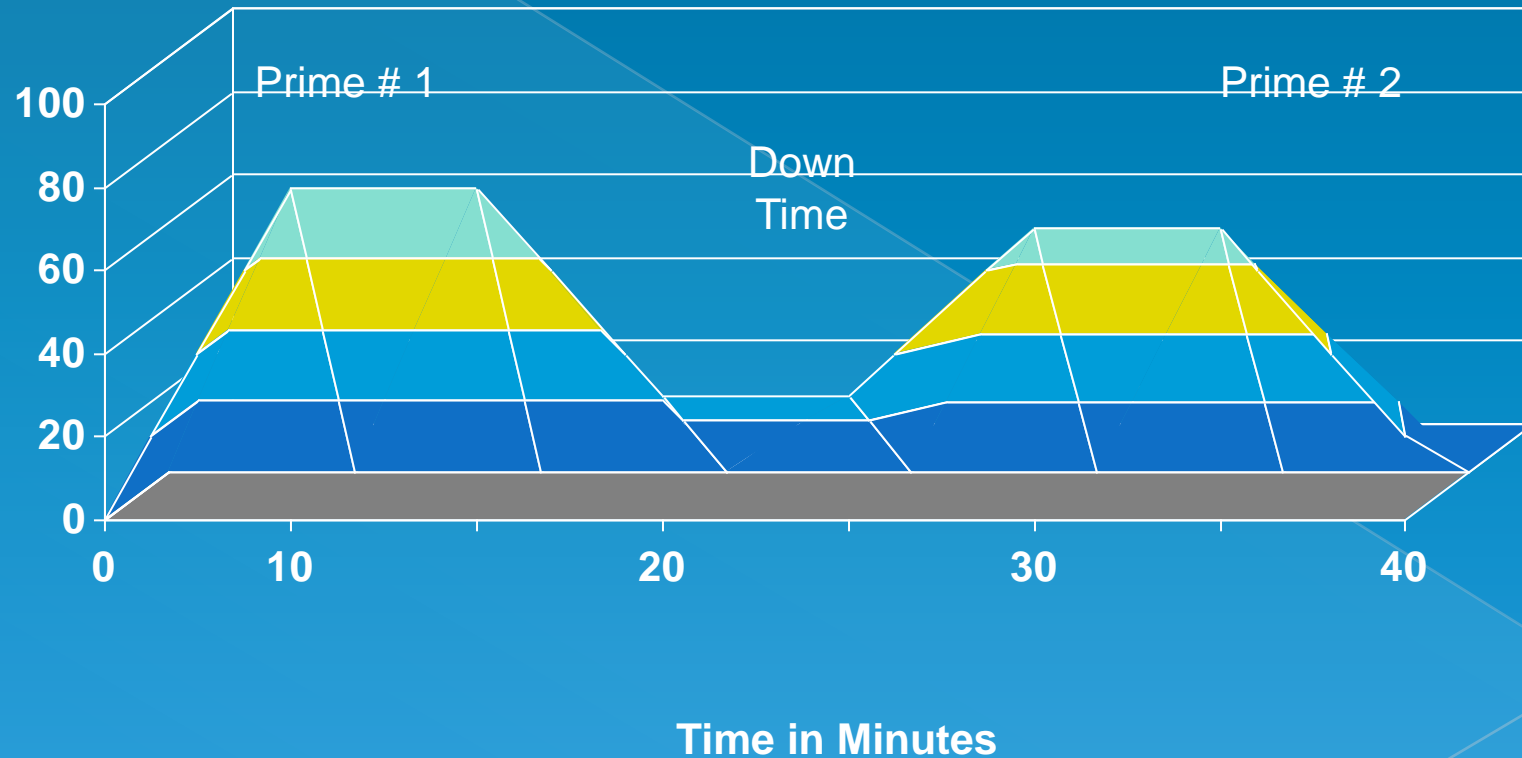
- In a minute I will show you a list of 8-3 lettered words
- You will have 15 seconds to look at those words.
- Then you will have 15 seconds to write down in order as many as you can.

Why Use Movement in the Classroom?

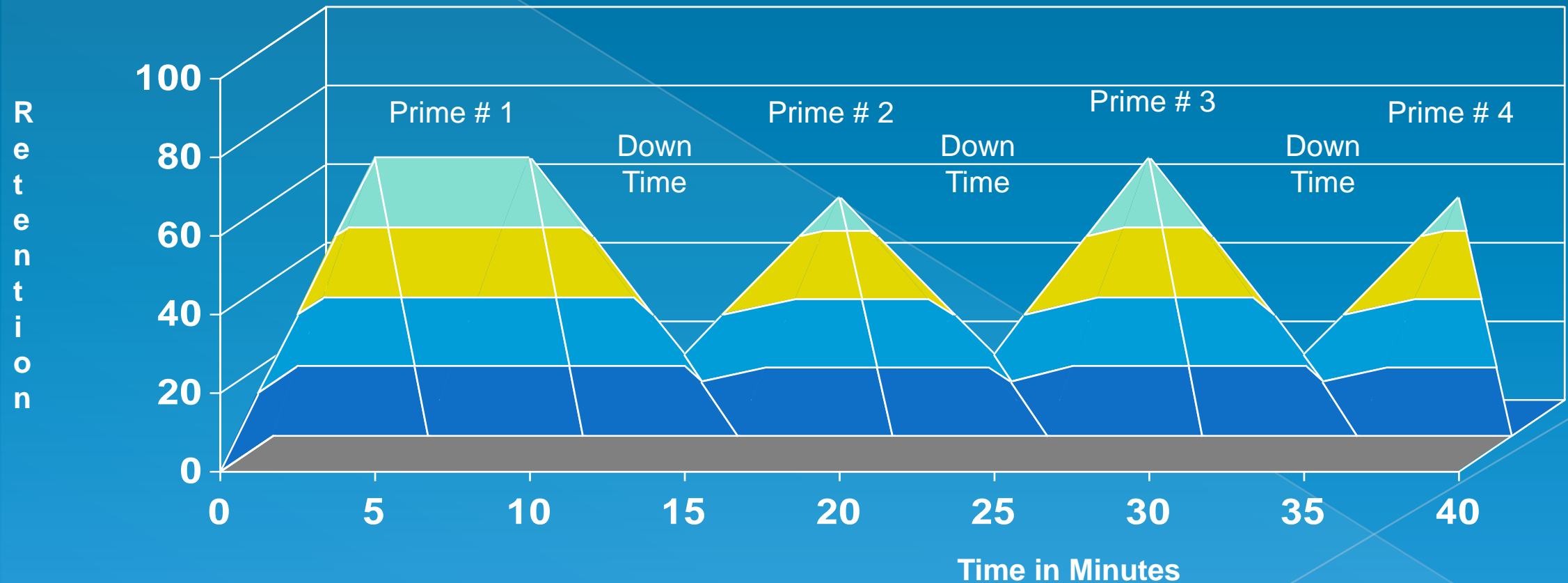
- First 3-4 words
- Last 1-2 words
- Difficulty remembering 6-8
- Primary-Recency Effect-
 - in a learning episode we tend to remember best that which comes first and remember second best that which comes last and the least of what comes in the middle

How to Incorporate Movement into Instruction

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How Incorporate Movement into the Classroom



How to Incorporate Movement into the Classroom

Episode Time	Prime Time Minutes	Prime Time Percent	Down Time Minutes	Down Time Percent
20 min	18	90%	2	10
40 min	30	75%	10	25
80 min	50	62%	30	38

Activity Energizers and Academic Achievement

● Providing Physical Activity breaks during classroom instruction:

- > Increases on task behaviors among all students-8% overall and 20% for at risk students***
- > Increase concentration focus and academic test scores***

Thank You for Attending!

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