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# Effective Learning with Multi-Media

**In this presentation, learners will review eight principles of *Multi-Media Learning***

**Created by Keith V. Bletzer, Editorial Board**
***Anthropology-Open Access Journal***

# *Multi-Media Learning* (2001)

**Richard E Mayer proposes:**

**3 foundations (multi-media)**

**2 cognitive stressors**

**3 steps into memory**

**3 assumptions (cognition)**

# 3 foundations (multi-media)

Intelligibility and Plausibility

'Compatible' and 'Consistent'
with how people learn

**Applicability**
***fits* with multi-media**

# 2 cognitive stressors

Intrinsic Cognitive Load:
inherent difficulty of material

Extraneous Cognitive Load:
how the message is designed

# 3 steps into memory

**Selecting**: attends to relevant words and pictures, especially core items & main steps

**Organizing**: builds ***internal*** connections, creates coherent model (verbal or pictorial)

**Integrating**: builds ***external*** connections with coherent model *and* prior knowledge

# 3 assumptions (cognition)

## Paired Channels

Visual and Auditory

## Limited Working Memory

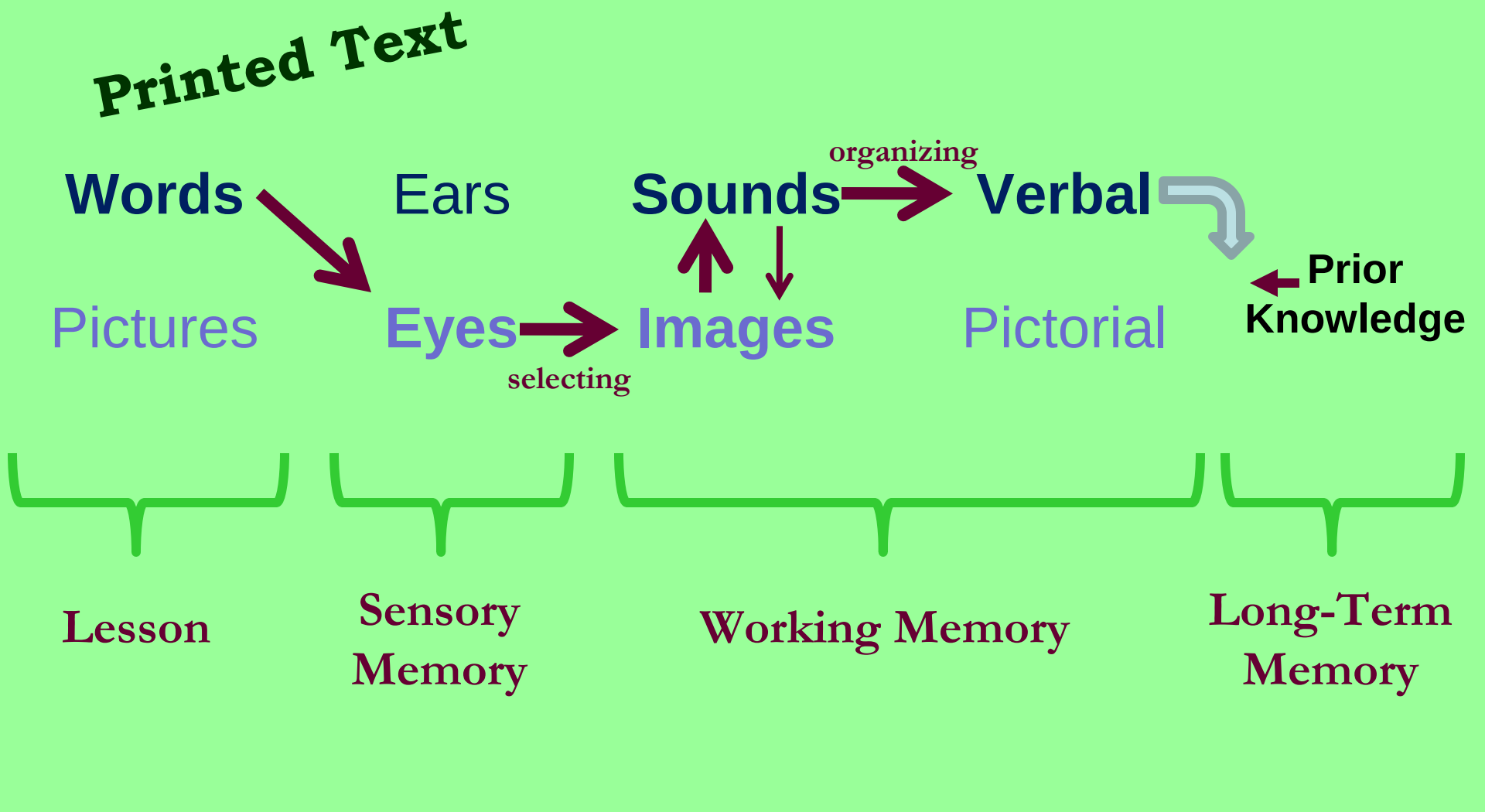
5 to 7 items, or 5 to 7 chunks (items)

## Active Processing

*Attend* to input

*Organize* it -- *Integrate* it

# This is more work…

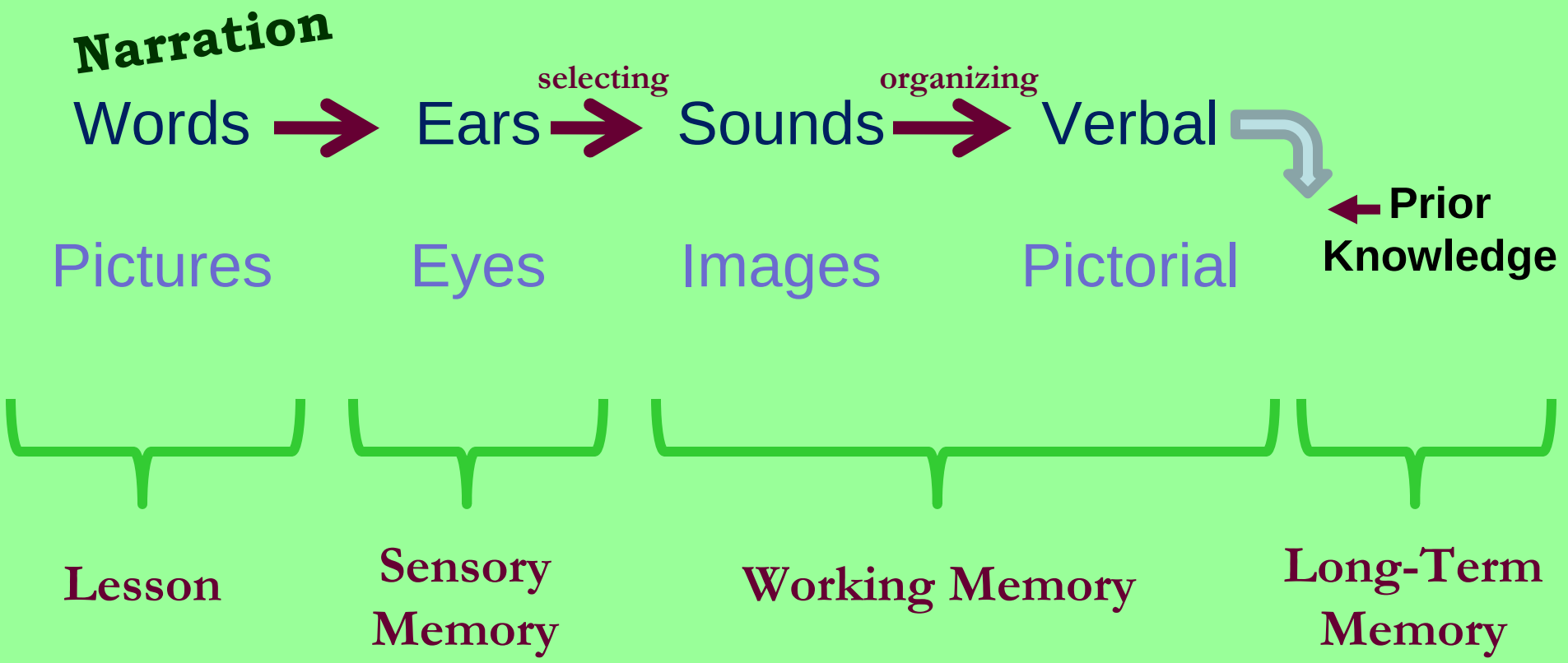


# Multi-Media Model

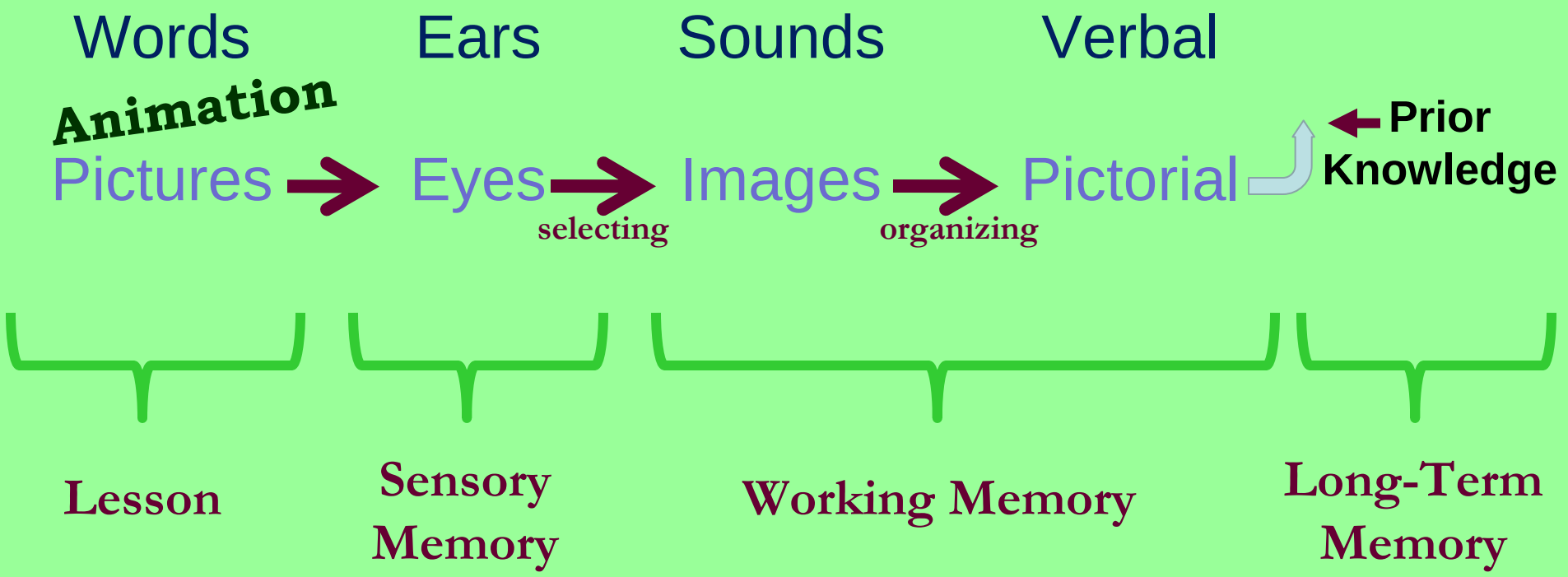
Paired Presentation

“Narration” & “Animation”

# One Channel


Narration
Words
selecting
Ears
organizing
Sounds
Verbal
Prior Knowledge
Pictures
Eyes
Images
Pictorial
Lesson
Sensory Memory
Working Memory
Long-Term Memory

# One Channel


Words
Ears
Sounds
Verbal
Animation
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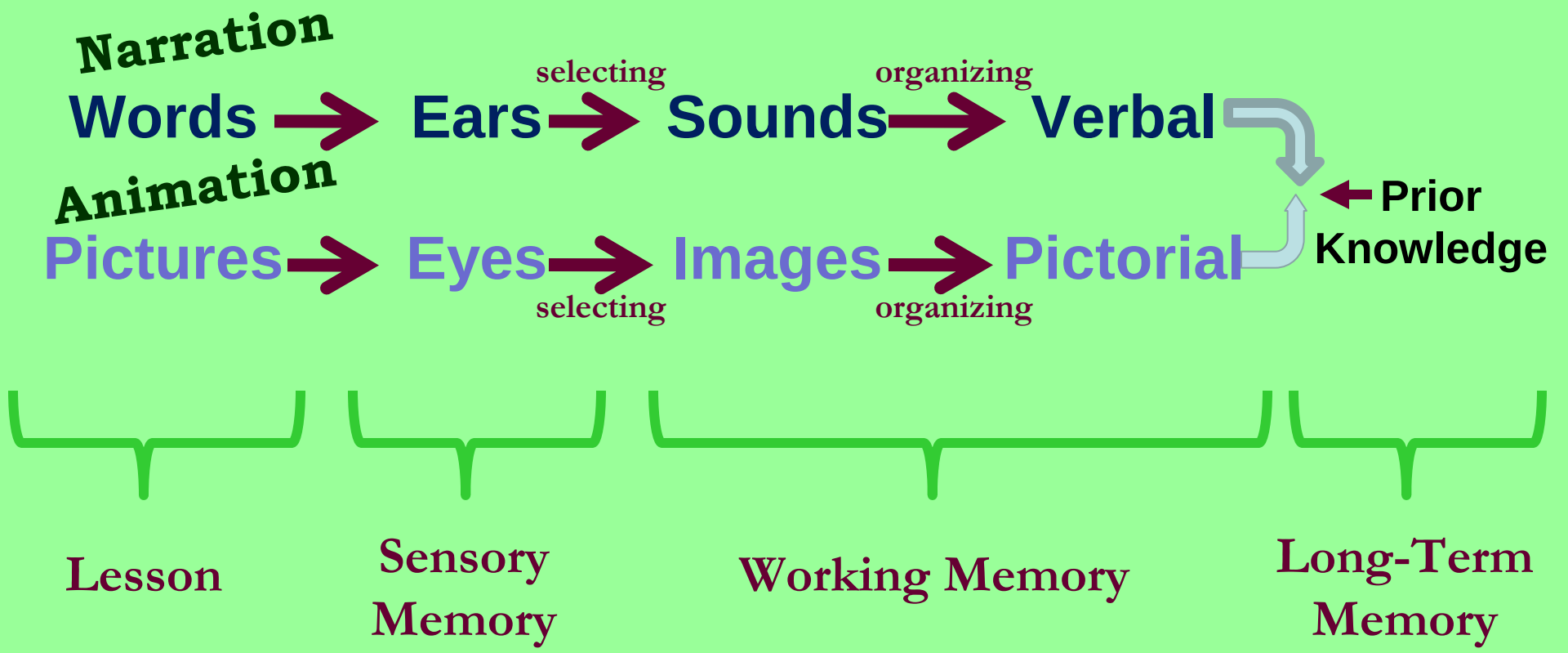
selecting
Images
organizing
Pictorial
Prior Knowledge
Lesson
Sensory Memory
Working Memory
Long-Term Memory

# Multi-Media Model

## Dual Channels

"auditory" and "visual"

# This is less work…



# One learns better when words and picture appear near each other, than words alone

- Words and pictures together encourage verbal and pictorial mental models; assist making mental connections between them
- Narration = Words & Animation = Pictures

**Multimedia**

# One learns better when related pictures & words are presented spatially near, not far, and not on top of visual

Words and pictures together are held in working memory; focus attention better; and reduce need “to search” page/screen

## Spatial Proximity

# One learns better when words and pictures are presented simultaneously, rather than successively

Bits (*chunks*) of narration and animation are held in working memory more easily; encourage mental connections between verbal and visual representations

## Temporal Contiguity

# One learns better when extraneous stuff is excluded, rather than included

Extraneous stuff competes for energies in working memory; diverts focus from core idea & moves into inappropriate themes; disrupts organizing the material cognitively

**Coherence**

Chunking is bunch
together for mea ul
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Memory Box

chunks?

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get chunks

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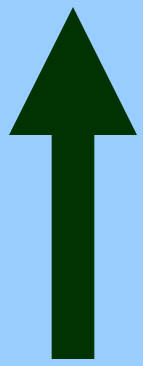
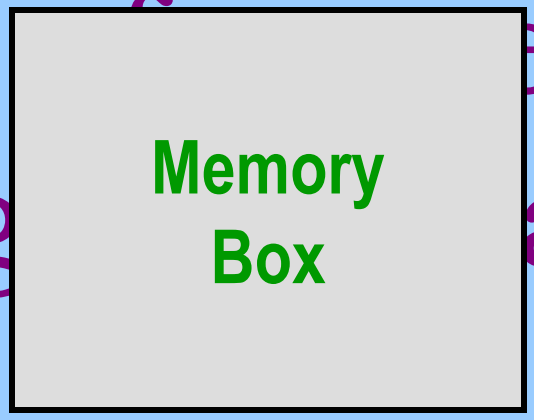
get chunks

Chunking
items in memor



# Better

Chunking is bunching together [illegible] eaningful cog[illegible]a




Placing knowledge in memory box

chunks

chunks

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chunks

**IN THIS EXAMPLE**

**Coherence is increased through enhanced spatial proximity and enhanced temporal contiguity;**

**Animated text is used, no narration;**

**Extraneous text/animation is removed.**

# One learns better from animation and narration, than animation and on-screen text

- Words through auditory/verbal channel are more easily processed, which leaves open visual/pictorial channel (prevents “jumble”)
- More effective if spoken, than printed text

**Modality**

# One learns better from animation and narration, than animation/narration with text

- Pictures & words together (animation/text) can sometimes overload the visual channel
- More effective to teach thru two channels, that is, ***Auditory*** and ***Visual***

## Redundancy

# Viceroy Butterfly (tastes good)

# Monarch Butterfly (tastes bad)

Photo by William T. Hark

# Viceroy Monarch

Mimicry means “to copy” an appearance for self-protection. Think of yourself walking down the street of a strange neighborhood. If you “dress” like most the people around you, you will be “safer.”

Our lesson today is **Natural Selection**.


**Better**

**Viceroy**

**Tastes good**

**Monarch**

**Tastes bad**

# Protective Coloration

## preserves “bad,” mimics “good”

**IN THIS EXAMPLE**

**Coherence is increased through enhanced spatial proximity;**

**Extraneous text is removed;**

**Printed text is separated from visual, but could be replaced by brief narration;**

**No animation is used, would be extraneous.**

# Design effects are stronger for low-knowledge & high-spatial, than those learners who are high-knowledge & low-spatial

High-knowledge learners use prior ideas to compensate poor guidance; high-spatial integrate visual/verbal images more easily; low-spatial require extra effort with images which detract from grasping visual / verbal

## Individual Difference

# Moderate arousal produces situation of greater learning than high or low arousal

Scare tactics, abrasive punishment, extreme threats and forceful put-downs do not generate conditions that are ideal for effective learning - Lancy and Grove (2010)

## Positive Environment

# What makes good multi-media?

- Mixed modalities -
- Simultaneous elements -
-Integrated meaningful structures-
- Concise -

# What should one aim for?

Conceptual, not topical relevance
Focused, not split attention

# Credits

***Multimedia Learning***, 2001, Richard E. Mayer
(Cambridge, MA: Cambridge University Press)

"**SMART, SMARTer, SMARTest**," Teaching Workshop Presented at
Annual Conference, Arizona Technology in Education Association
Vail, Arizona, October 29, 2012

"**Language Play,**" 2009, Don L.F. Nilsen and Alleen Pace Nilsen,
Department of English, Arizona State University, Tempe, Arizona

"**The role of adults in children's learning**," D. F. Lancy & M. A. Grove, 2010,
D. F. Lancy, J. Bock & S. Gaskins (editors), *The Anthropology of Learning in Childhood*, pages 145-179 (Walnut Creek, CA: AltaMira Press)

Butterfly pictures: Paul B. Sutherland and William T. Hark (google.com)

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THE END