

# Multimedia Design Principles

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## Less is more

- Extra information (e.g., on-screen text, irrelevant images) can reduce learning.
- Adapt to the limits of working memory. Learners can absorb only a few ideas at a time.
- Resist student preferences. Students think that copying text equals learning.
- Place notes to copy only at the end of a topic and provide silence while students copy.

## Redundancy Principle

*Students can't learn when there's duplication of information. Redundant information leads to less learning.*

**Verbal redundancy** = saying word-for-word what is on the screen

**Why?** The brain has to process the same verbal information twice, coming in the ear and the eye. The brain tires and tunes out.

### Tips

- ❶ Avoid excessive text and bullet points on the screen. Instead, use images, diagrams, and visuals.
- ❷ Use the audio track for most verbal information.

## Segmentation Principle

*Students remember best when complex ideas are broken down into steps or parts and build up progressively.*

**Why?** The brain can process only one or two pieces of new information at a time. It needs time to consolidate new information before absorbing more.

### Tips

- ❶ Break complex concepts into steps/parts.
- ❷ Present one step/part per screen.

## Coherence Principle

*Students remember best when a screen includes only relevant text and images. Anything that's extraneous from the content reduces learning.*

**Why?** The brain has to expend mental energy to sort out what's relevant.

### Tips

- ❶ Avoid distractions, decorations, background music, background patterns, and irrelevant cartoons.
- ❷ Use squares and highlights to focus attention on one part of a complex diagram.
- ❸ Avoid adding tangential information.

## Contiguity and Split Attention Principles

*Students remember best when related details are placed close to each other. Students learn poorly when they have to split their attention between multiple sources (and places) of information.*

**Why?** Attention is divided between disparate sources of information, making it more difficult to link important concepts.

### Tips

- ❶ Place labels as close as possible to the objects. (spatial contiguity)
- ❷ Show images and provide related explanations at the same time. (temporal contiguity)

## Image Superiority Principle

*Students remember better from images than from words.*

**Why?** Images help build mental models, which help consolidate and retain information.

**Mental models** = simplified diagrams using line drawings, arrows, boxes, circles, stickmen, etc.

### Tips

- ❶ If possible, illustrate a concept with images rather than text.
- ❷ Create diagrams to help facilitate mental model construction.