Ways to reduce
cognitive load

Cognitive Load

- A key challenge facing designers of multimedia instruction is the potential for cognitive overload—in which the learner's intended cognitive processing exceeds the learner's available cognitive capacity

- Multimedia instruction needs to be sensitive to cognitive load

Assumptions about how the mind works in multimedia learning

Dual channel: humans have separate information processing channels for verbal and visual material

Limited capacity: There is only a limited amount of processing capacity available in the verbal and visual channels

Active processing: Learning requires substantial cognitive processing in the verbal and visual channels

Demands for cognitive processing in multimedia learning

Essential processing: making sense of the presented material including selecting words, selecting images, organising words, organising images, and integrating

Incidental processing: non essential aspects of presentation material

Representational holding: holding verbal or visual representations in working memory cognitive
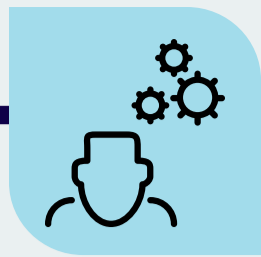
Visual channel overloaded by essential processing demands

- Move some essential processing from visual channel to auditory channel

Visual and auditory channel overloaded by essential processing demands

- Allow time between successive bite-size segments

- Provide pretraining in names and characteristics of components

One or both channels overloaded by essential and incidental processing (attributable to extraneous material)

- Eliminate interesting but extraneous material to reduce processing of extraneous material

- Provide cues for how to process the material to reduce processing of extraneous material

One or both channels overloaded by essential and incidental processing (attributable to confusing presentation of essential material)

- Place printed words near corresponding parts of graphics to reduce need for visual scanning

- Avoid presenting identical streams of printed and spoken words

One or both channels overloaded by essential processing and representational holding

- Present narration and corresponding animation simultaneously to minimise need to hold representations in memory

- Make sure learners possess skill at holding mental representations

Reference:

Mayer, R., & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist*, 38 (1), 43-53