



11.2 | Apply: Sensory Message Design Factors

This is an expanded version of Table 11.2 from *Streamlined ID* (2027) of a wide range of sensory messages and form factors to consider when designing instructional messages.

Sample Uses of Sensory Messages and Relevant Factors to Consider

TYPE OF SENSORY MESSAGE AND USES		FORM FACTORS TO CONSIDER
Visual Messages - Decorate with visuals to gain or maintain learner attention. - Illustrate a procedure or communicate the progress of a story or process. - Provide a conceptual metaphor. - Use icons to convey spatial information. - Support the development of proper mental models by visually organizing information into meaningful groups. - Reduce cognitive load by distributing cognitive processing between the brain's visual and verbal processing channels. - Provide emotional or situational context for scenarios or examples, and contextual triggers to help learners link situational conditions to specific actions to be taken. - Provide emotional or situational context for scenarios or examples. - Provide contextual triggers to help learners link situational conditions to specific actions to be taken. - Communicate spatial information using icons.	- Color, Shape, Pattern; - White space; - Placement of visual elements. - Font type, size, and enhancements (bold, italics, underline); - Highlight and shading; - Text-to-background contrast (for accessibility and learner focus); - Image style (e.g., level of realism ranging from line drawings to full-color photos); - Refer-ability (ability to review) - Accessibility.	
Aural (Auditory) Messages - Describe a procedure. - Narrate instruction. - Tell a story. - Convey content for those with vision issues or who wish to consume content while doing other things that require their visual attention.	- Volume, Pitch, Tone; - Intensity; - Style; - Rhythm; - Duration;	For audio narration: - Voice quality, vocal modifiers and identifiers, inflection, tone of voice; - Language and regional pronunciations; - Cultural orientations of the target learner. For music: - Timbre, frequency, and amplitude;



TYPE OF SENSORY MESSAGE AND USES		FORM FACTORS TO CONSIDER	
▪ Provide context, reinforcement, or notification of instructional events via sound effects (FX). ▪ Establish a mood with music. ▪ Communicate temporal information using earcons (structured, abstract messages used to communicate aurally).		▪ Speed, pacing, and amount of learner control allowed for those factors; ▪ Potential for noise originating with sender or receiver; ▪ Waveform (e.g., for earcon design); ▪ Refer-ability; ▪ Accessibility.	
Haptic (Touch-Based) Messages ▪ Communicate via tactile feedback, cutaneous perception, and force-feedback devices; ▪ Provide instruction concerning interpersonal space;; ▪ Communicate spatial and temporal information using hapticons, tactons, or tactile icons (structured, abstract messages used to communicate non-visually); ▪ To communicate via wearable technology; ▪ Sensory substitution; ▪ Cueing via surface texture, edges, and lines; ▪ Braille and tactile graphics instruction for the blind; ▪ Use of the Tadoma tactile language for instruction for the deaf/blind; ▪ Communicate directional information in situations where visual directions are unavailable or inaccessible..		▪ Frequency, vibration; ▪ Intensity or amplitude; ▪ Waveform (e.g., for a tactile pulse); ▪ Duration and Rhythm; ▪ Direction, position, location, and body location (e.g., fingers, back, thigh, abdomen); ▪ Force, pressure. ▪ Motion; ▪ Speed; ▪ Temperature; ▪ Texture; ▪ Pain; ▪ Indention; ▪ Shape; ▪ Edge direction; ▪ Spatiotemporal patterns; ▪ Refer-ability; ▪ Accessibility.	
Olfactory Messages ▪ Smells are good memory retrieval cues, use them to activate prior knowledge, trigger or access emotions and emotional memories, and encode content for future recall (e.g., provide contextual cues for future environments). ▪ Stimulate the memorization of concepts or experiences. ▪ Olfactory notifications of danger for personal safety (e.g., fire or spoilage).		▪ Intensity; ▪ Type of smell; ▪ Concentration; ▪ Timing; ▪ Temporal dynamics and spatial localization; ▪ Duration, length of exposure; ▪ Quality; ▪ Chemical makeup, mixing ratios;	



TYPE OF SENSORY MESSAGE AND USES	FORM FACTORS TO CONSIDER
▪ Desensitize individuals to certain smells so that they can operate effectively in the event of an emergency. ▪ Training to recognize scents for tasks requiring olfactory distinctions (e.g., inspections and evaluations, and disease diagnoses). ▪ Communicate via pheromones. ▪ To influence or enhance attention, reaction time, emotions, mood, memory, and performance, or to reduce stress and errors during instruction.	▪ Presence or absence; ▪ Combinations; ▪ Inter-subject variability; ▪ Varying olfactory preferences and abilities over time (e.g., impacts of aging on smell sensitivity); ▪ Cross-sensory influences and interactions; ▪ Cultural differences in interpretation of smells; ▪ Refer-ability; ▪ Accessibility.
Gustatory Messages ▪ Enhance multi-sensory learning experiences (e.g., dining experiences). ▪ Stimulate and enhance positive experiences (sweet sensations). ▪ Overwhelm and surprise (sour sensations). ▪ Support and enhance learning experiences through combined gustatory/olfactory messages. ▪ Address food aversions. ▪ Support cultural assimilation or acceptance (e.g., learning to tolerate and enjoy international foods).	▪ Temporality (duration); ▪ Affective reactions corresponding to tastes; ▪ Embodied mouth feeling (trigeminal/oral somatosensory inputs); ▪ Congruency; ▪ Intensity; ▪ Electrical pulses to induce virtual taste sensations; ▪ Location on the tongue; ▪ Taste sub-modalities (sweet, sour, salty, bitter); ▪ Inter-subject and cultural variability in interpretation of tastes; ▪ Varying gustatory preferences and abilities over time (e.g., impacts of aging on taste sensitivity); ▪ Cross-sensory influences and interactions; ▪ Religious customs/restrictions; ▪ Refer-ability; ▪ Accessibility.

(Compiled from Brewster & Brown, 2004; Dirksen, 2016; Dobbstein et al., 2017; Efe, 2017; Golombisky & Hagen, 2010; Lohr, 2008; Obrist et al., 2016; Weinschenk, 2011, 2016).