**Supplemental Digital Content, Table 1. Universal Design for Learning Guidelines6**

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| **Engagement** | **Representation** | **Action & Expression** |
| Self-Regulation Optimize motivationFacilitate coping skillsDevelop self-assessment/reflection | ComprehensionBackground knowledgeHighlight patterns, critical features, big ideas, relationshipsInformation processing, visualization,  manipulationMaximize transfer and generalization | Executive FunctionsAppropriate goal settingPlanning and strategy  developmentMonitoring progress |
| Sustained Effort and PersistenceSalience of goals and objectivesVary resources to optimize challengeFoster collaboration and communityIncrease mastery-oriented feedback | Language, Mathematical Expression, SymbolsClarify vocabulary and symbolsClarify syntax and structureSupport decoding text, mathematical  notation and symbolsPromote understanding across  languagesIllustrate through multiple media | Expression and CommunicationUse multiple media for  communicationUse multiple tools for construction and comparisonBuild fluency to support practice and performance |
| Recruiting InterestOptimize choice and autonomyOptimize relevance, value,  authenticityMinimize threats and distractions  | PerceptionCustomize display of informationAlternatives to auditory informationAlternatives to visual information | Physical ActionVary response and navigationOptimize access to tools and  assistive technology |