Core Concept: Joining

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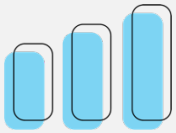
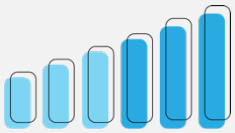
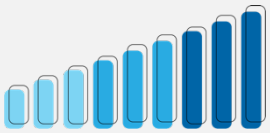
Engineering Literacy Dimension: Engineering Practices
Practice: Material Processing
Overview: *Joining* is the process of creating a product from two or more parts through the actions of bonding and/or mechanical fastening. This core concept includes knowledge related to the basic methods of (a) *fastening through both mechanical fasteners and mechanical force*, (b) *adhesive bonding*, (c) *flow bonding (brazing and soldering)*, and (d) *welding*. Joining is important to the practice of Material Processing as very few products are made from just one part. Furthermore, engineering professionals apply an understanding of these joining processes to inform their decisions when developing a design and performing the operations to assemble a product from multiple parts.

Performance Goal for High School Learners
I can successfully use knowledge of joining methods to inform my decisions when developing a design as well as to physically assemble parts into a quality product.

	 Basic	 Proficient	 Advanced
FASTENING (Mechanical Fasteners & Force)	I can describe when and why the fastening process is most appropriate for joining specific materials.	I can analyze how the properties and shapes of the materials to be joined would be altered when being fastened.	I can correctly and safely practice the fastening process in building a physical product.
ADHESIVE BONDING	I can describe when and why the adhesion process is most appropriate for joining specific materials.	I can analyze how the properties and shapes of the materials to be joined would be altered when being adhered.	I can correctly and safely practice the adhesion process in building a physical product.
FLOW BONDING (Brazing & Soldering)	I can describe when and why the flow bonding process is most appropriate for joining specific materials.	I can analyze how the properties and shapes of the materials to be joined would be altered when being flow bonded.	I can correctly and safely practice the flow bonding process in building a physical product.
WELDING	I can describe when and why the welding process is most appropriate for joining specific materials.	I can analyze how the properties and shapes of the materials to be joined would be altered when being welded.	I can correctly and safely practice the welding process in building a physical product.