Core Concept: Separating/Machining

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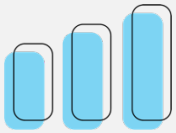
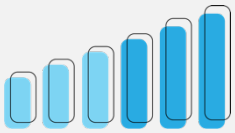
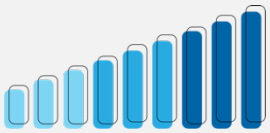
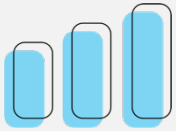
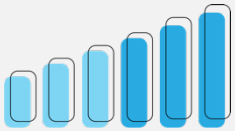
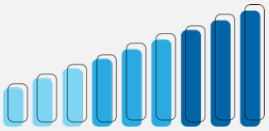
Engineering Literacy Dimension: Engineering Practices
Practice: Material Processing
Overview: *Separating/Machining* include the processes that give an object a desired form by removing excess materials which includes knowledge related to basic machine operations of (a) *drilling*, (b) *cutting*, (c) *milling*, (d) *turning*, (e) *grinding*, and (f) *shearing*. This core concept is important to the practice of Material Processing as the related operations are the foundation for production and manufacturing of physical products. Furthermore, engineering professionals apply an understanding of these processes to inform their decisions when developing a design and performing the operations to remove undesired materials to achieve a desired form of a product.

Performance Goal for High School Learners
I can successfully use knowledge of Separating/Machining to inform my decisions when developing a design as well as to physically change the shapes of objects by removing excess material.

	 Basic	 Proficient	 Advanced
DRILLING	I can describe when and why the drilling process is most appropriate for changing the size and shape of specific materials.	I can analyze how a certain material (to be machined) would change its shape when being drilled.	I can correctly and safely practice the drilling process in building a physical product.
CUTTING	I can describe when and why the cutting process is most appropriate for changing the size and shape of specific materials.	I can analyze how a certain material (to be machined) would change its shape when being cut.	I can correctly and safely practice the cutting process in building a physical product.
MILLING	I can describe when and why the milling process is most appropriate for changing the size and shape of specific materials.	I can analyze how a certain material (to be machined) would change its shape when being milled.	I can correctly and safely practice the milling process in building a physical product.
TURNING	I can describe when and why the turning process is most appropriate for changing the size and shape of specific materials.	I can analyze how a certain material (to be machined) would change its shape when being turned.	I can correctly and safely practice the turning process in building a physical product.

Core Concept: Separating/Machining Cont.

Performance Goal for High School Learners
I can successfully use knowledge of Separating/Machining to inform my decisions when developing a design as well as to physically change the shapes of objects by removing excess material.

	 Basic	 Proficient	 Advanced
GRINDING	I can describe when and why the grinding process is most appropriate for changing the size and shape of specific materials.	I can analyze how a certain material (to be machined) would change its shape when being ground.	I can correctly and safely practice the grinding process in building a physical product.
SHEARING	I can describe when and why the shearing process is most appropriate for changing the size and shape of specific materials.	I can analyze how a certain material (to be machined) would change its shape when being sheared.	I can correctly and safely practice the shearing process in building a physical product.