

Children's Engineering and Makerspace Activities

	Children's Engineering Activities	Maker/ Tinkering Activities
Project Guides	<p>Design Brief</p> <p>Project based on design brief that dictates materials, tools, and criteria.</p>	<p>Models, websites, "recipes"</p> <p>Project based on student choice. Could be inspired by question or impulse the learner has.</p> <p>Might be based on a prompt (Brevity, Ambiguity, Immunity to Assessment)</p>
Teacher/ Mentor	<ul style="list-style-type: none"> • Watches and answers questions with questions • Understanding of children's engineering design process • Strong knowledge of curriculum and standards 	<p>Works alongside students; provides help before child reaches frustration levels</p> <p>Must have:</p> <ol style="list-style-type: none"> 1. Strong knowledge of curriculum and standards 2. Flexibility 3. Organization 4. Resourcefulness <ul style="list-style-type: none"> • Ethnographer (Knows what children already know) • Documentarian (Collect evidence of learning that makes the invisible thinking of children visible) • Studio Manager (Makes tools, materials, and resources available so children can make their ideas come to life) • Wise Leader (Guide children's inquiry towards big ideas without coercion)
Ways to complete activities	<p>Groupwork (usually)</p> <p>Activity specified by teacher</p>	<p>Student choice (individual, pairs, groups)</p> <p>Student directed</p>
Beginning a Project	<p>Students create blueprints and plan</p>	<p>Let students decide whether or not to draw out plans. Students should be able to see and hear ideas from others and borrow liberally.</p>

Information from: Invent to Learn by Sylvia Libow Martinez and Gary Stager, Ph.D.
Tinkering: Kids Learn by Making Stuff by Curt Gabrielson
Makerspace Playbook: School Edition 2013 from Maker Media

Assessment	Graded/ rubric	Not graded (Immunity to assessment)
Project Building Process	Linear design process from start to finish often with checklist; sometimes circular if time permits	Very messy
Time	Often one chance to finish project; Time limit is often set	Build as many iterations of project as maker student wants. Lots of times to explore.

Characteristics of a Good Tinkering Session

- The session is focused on the students.
- The facilitator is not lecturing much to the group.
- The facilitator is engaged nearly constantly with the students.
- Students are working together.
- Many materials are available, and many options are open.
- Questions are thick in the air.
- There's an atmosphere of joyous desperation.
- Clear order exists amidst the noise and mess.



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