

GNRG bootcamp and basecamp - makes, hacks, design challenges

This is a running list of cool, fun, engaging, complex **design challenges** and prototyping builds/makes/hacks

these descriptions are not comprehensive. you will need to look up more information.

We'll break the DC's into three categories

cat.1. "hand-storm" = multiple iterations of build/prototypes in one block of time

cat.2. "rapid DC" = challenges that take one class block to build, maybe half a block to test

cat.3. "deep dive DC" = challenges that take multiple days to research, build, and test

DESIGN CHALLENGE / HACK	STUFF	INSTRUCTIONS / LINKS
paper tower cat.1	1 8.5x11 piece of paper 1 meter of tape	make the tallest tower with paper. tape only for securing paper together not for foundation https://docs.google.com/document/d/1rq-z2e1DTgFBxYIGEW1ChjJTvnU8gtAyWWrwdf1jeSU/edit
high rise tower cat.1-2	tennis ball 6 sheets of 8x11 paper 12" string tape skewers electric fan	build min. 18" high tower that supports the ball and withstands winds from fan, with minimum use of resources. http://pbskids.org/designsquad/parentseducators/resources/high_rise.html
marshmallow pasta tower cat.1-2	1 marshmallow 1 meter tape 1 meter string 20 pieces spaghetti	http://marshmallowchallenge.com/TED_Talk.html
lego tower cat.1	legos	build tallest tower, using least amount of materials. cost v. benefit analysis. material resources and time https://docs.google.com/open?id=0BxpleVHSXRWJRTEtdkhSYWpKTKk
capacitive stylus cat.1	thin picture wire pen parts sponge (Scotch brite?) aluminum foil dowel/pencils	http://www.instructables.com/id/DIY-Capacitive-Stylus/ http://howto.cnet.com/8301-11310_39-20103944-285/how-to-make-a-free-ipad-stylus/

solar car cat.2	small solar cells cardboard skewers CDs tape motors gears k'nex	http://www.instructables.com/id/Mini-Solar-Car/0
windmill (mechanical/electrical) cat.2	cardboard k'nex motors base/stand string CDs	http://www.instructables.com/id/Ted-Baer-s-Bicycle-Wheel-Windmill/ http://www.instructables.com/id/Model-Wind-Turbine-KidWind-Project/
hero's Fountain cat.2-3	3 plastic water bottles playdough water straws tube	http://www.instructables.com/id/Recreate-Herons-fountain-from-water-bottles/
solar water pump cat.2	solar cell h2o pump	http://www.builditsolar.com/Projects/WaterPumping/waterpumping.htm
solar oven cat.2	cardboard boxes plastic sheet aluminum foil/black paper pot?	
Solar Battery cat.2 Note: only 12 microwatts	copper sheeting salt water	http://sci-toys.com/scitoys/scitoys/echem/echem2.html#solarcell
penny batteries cat.2	pennies led lights vinegar cloth Al foil	http://www.instructables.com/id/Penny-and-Nickel-Battery/
milk plastic cat.2	milk vinegar	http://www.instructables.com/id/Plastic-Milk/
paperclip machines cat.2	paperclips woodblock base	http://www.instructables.com/id/Building-Machines-From-Paperclips/
rubber band builds	rubberbands	http://pbskids.org/designsquad/pa

cat.2	cardboard	rentseducators/resources/rubber_band_car.html http://www.instructables.com/id/Klutz-Rubber-Band-Powered-Contest-Winners/
solar thermosyphon and gravity cat.2	lamp cups tubing water	http://pbskids.org/designsquad/parentseducators/resources/feel_the_heat.html http://www.instructables.com/id/Solar-panel-air-heater-made-of-pop-cans/
katniss survival kit cat.2	assembled	http://www.instructables.com/id/Survival-Kit-STEM-Project/
cookie/muffin mining(k-5activity) cat.1-2	cookies/muffins	http://teachers.egfi-k12.org/cookiemining/
drill generator cat.2-3	battery pwrdr drill aluminum foil string tape mixing wand electrical parts	http://www.instructables.com/id/FREE-EMERGENCY-ELECTRICITY/
mini lego dynamo-motor charger		http://www.instructables.com/id/How-to-charge-your-mp3-player-using-Lego-mindstrom/
fire piston cat.3	acrylic tubes/rods	http://www.instructables.com/id/SLAM-ROD-FIRE-STARTER-IGNITION-BY-AIR/
shake light cat.2	old flashlight magnets insulated magnet wire pvc pipe electrical parts	http://www.instructables.com/id/MAKE-A-FLASHLIGHT-THAT-DONESNT-NEED-REPLACEMENT-BU/
bag projects cat.1-2-3	WFM bags fused plastics reused materials/fabrics sewing machine	http://www.instructables.com/id/Used-Plastic-bags-and-accessories/ GRNG
mud power cat.3	mud and stuff	http://makeprojects.com/Project/Bacteria-Battery/2106/1#.UEUoH

		cFISWY
pedal power projects cat.3		http://www.instructables.com/id/How-To-Build-A-Bicycle-Generator/ http://www.youtube.com/watch?v=-U-mvfjyiao http://www.instructables.com/id/Bicycle-Power-for-Your-Television,-Laptop,-or-Cell-/ http://www.instructables.com/id/Bike-Dyno-convert-your-pedal-power-to-HORSEPOWER/step6/Pedal-like-crazy-and-calculate-your-Horsepower/