**The STEM family night schedule with six STEM nights per year, for 2015–2017.**

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| **Monthly “main” activity** | **Source (activities have been modified, but are based on these sources)** | **Concepts** | **Focus SEP’s** | **Activity** |
| 10/6/15  Launcher | Familyengineering.org | Engineering, Energy | Asking Questions, Plan/Conduct Investigations, Analyze Data | Using a plastic spoon, craft sticks, and rubber bands, students design a launcher that will shoot a cotton ball the farthest distance. This helps them understand the conversion of potential energy to kinetic. |
| 11/3/15  Hot Cocoa Machine | Familyengineering.org | Engineering, Gravity | Define Problems, Design Solutions | Using 20 paper cups, a pencil, and warm water, cocoa, and powdered milk, students design a gravity-fed machine that makes a cup of hot (warm) chocolate. The milk and cocoa are in separate cups, and warm tap water is poured into a third cup – water trickles through the cups via holes made by pencils, mixing the powders. |
| 12/1/15  Team Up | Familyengineering.org | Engineering | Define Problems, Design Solutions | Using 20 pipe cleaners, students compete to construct the tallest free standing structure. |
| 2/2/16  Puff Car mobile | PBSKids.og/zoom | Energy, Inertia, Friction | Asking Questions, Plan/Conduct Investigations, Analyze Data | Using straws, tape, cardstock, paperclips, and lifesavers candy, students make a vehicle that is propelled by a puff of air (blowing). The vehicle that travels the farthest wins. |
| 3/1/16  Seed Dispersal | Rice and Russel (2001) “sailing seeds” and sciencebuddies.org “gone with the wind” | Plants, Adaptations, Surface Area | Asking Questions, Plan/Conduct Investigations, Develop Models, Analyze Data, Scientific Argument | Using craft supplies, tape, and sunflower “seeds” (seed inside hull), students design a fruit to carry the seed as far from the fan as possible. |
| 4/5/16  Blast Off | Familyengineering.org | Engineering, Inertia, Gravity | Asking Questions, Plan/Conduct Investigations, Analyze Data | Using a flexible plastic condiment bottle as the air source, students design a paper rocket, looking at variables that affect speed and distance of their rockets. |
| 10/4/16  Bottle Rockets | Sciencebudies.org and www.alkaseltzer.com/science-experiments/rockets/ | Chemical reactions, Force, Inertia, Drag | Asking Questions, Plan/Conduct Investigations, Develop Models, Analyze Data | Using film canisters, water, and alka-seltzer, students investigate which combinations lead to the film canister “rocket” shooting highest into the air. (\* goggles) |
| 11/1/16  Roller Coaster Design | Teachengineering.org | Energy and Gravity, Velocity, Acceleration | Define Problems, Plan/Conduct Investigations, Design Solutions, Communicate Information | Using 3/8 inch Inner Diameter PVC tubing (in 9 foot lengths), masking tape, meter sticks, and ¼ inch stainless steel ball bearings, students are tasked with designing a roller coaster that has as many loops as possible for the ball bearing to make it to the end of the track. |
| 12/6/16  Plankton Races | Teachengineering.org “clay boats”, and Boss, Karp-Boss, and Jumars (2006) | Adaptations, Plants, Photic Zone, Buoyancy, Surface Area, Volume, Density, Inertia, Drag | Asking Questions, Plan/Conduct Investigations, Develop Models, Analyze Data | Using modeling clay, 250 ml graduated cylinders, timers, and corn syrup students build model phytoplankton with the goal of having the plankton not float, but not sink fast either (the slowest sinker wins). |
| 2/7/16  Windmill Design | [www.kidwind.org](http://www.kidwind.org) and rechargelabs.org | Energy, Surface Area | Define Problems, Plan/Conduct Investigations, Analyze Data, Design Solutions | Using corks, toothpicks, cardstock, tape, straws, craft sticks, paper, and shish-ka-bob sticks, students design a hand-held windmill that, as blades rotate, will lift a cup holding pennies. The windmill that lifts the most pennies wins. (\*sharp sticks) |
| 3/7/16  Rubber Band Helicopter | <http://www.instructables.com/id/Rubberband-Helicopters-step-by-step/?ALLSTEPS> | Energy, Lift, Bernoulli | Define Problems, Plan/Conduct Investigations, Analyze Data, Design Solutions, Communicate Information | Using 6-inch nose propellers, craft sticks, cardstock, tape, and rubber bands, students design a body for a rubber band helicopter. The helicopters are then flown to see which goes the furthest distance. |
| 4/4/16  Artbot | Sciencebuddies.org | Circuits | Define Problems, Plan/Conduct Investigations, Design Solutions | Using plastic cups, markers, tape, craft sticks, modeling clay, and a vibrating pager motor plus battery, students design a robot that draws – then they try adding weights and balancing the robot, so that it draws a straight line. |