

FLEXHIBIT

Curate. Educate. Rotate.

AIR ROCKET

Air Rocket user selects a rocket or builds their own, places it on the launch pad and experiences Sir Isaac Newton's First Law of Motion first hand! Users approach the Education Outreach STEM Cart and select an Air Rocket to place on the launch pad. The user then cranks the rotary pump handle to reach the desired PSI (0-30) and presses the green button when ready to launch. Users can explore the effects of varying the air pressure to achieve different results with each launch.

STEM Concepts Taught:

- Vernier Technology
- Phenomena of Newton's Laws
- Interactive/Exhibit Technology
- Engineering Design and Math Calculations

STEM Careers:

- Aerospace Engineer
- Rocket Engineer
- Rocket Scientist
- Pyrotechnics Specialist
- Metallurgist
- Physicist
- Computer Engineer
- Computer Scientist
- General Engineer
- Meteorologist
- Research Engineer
- Astronaut



Next Generation Science Standards (NGSS) Aligned Unit Plans:

The Air Rockets Education Outreach STEM Cart includes two lessons aligned with the Next Generation Science Standards (NGSS). Teachers will have the option of implementing the NGSS aligned STEM science curriculum with their students thanks to your outreach to their classrooms.

FLEXHIBIT

Curate. Educate. Rotate.

BERNOULLI

See the Bernoulli Principle in action! Suspend light-weight spheres in mid-air!

User approaches the Bernoulli Education Outreach STEM Cart and selects a colored Ping-Pong ball. The user presses the green button to activate the airflow for 10 – 17 seconds (0 – 128 second range) and then attempts to suspend the ball in a small stream of air, finding the right position. Try to toss a ball and "catch" it in a stream of air, or suspend a ball in each air stream simultaneously before the timer runs out.

The Bernoulli Principle states; when air flows around an object the air pressure changes as the velocity of the air changes. When air velocity increases over an object it lowers the pressure and as the air moves slower over an object the pressure begins to raise thus causing lift.

STEM Concepts Taught:

- Aviation Principles
- Exhibit Technology
- Vernier Technology
- Engineering Concepts
- Math Calculations

STEM Careers:

- Aerospace Engineer
- Aerodynamics Engineer
- Fluid Dynamics Engineer
- Aeronautical Engineer
- Commercial Aviation Pilot
- Flight Test Engineers.



Next Generation Science Standards (NGSS) Aligned Unit Plans:

The Bernoulli Education Outreach STEM Cart includes two lessons aligned with the Next Generation Science Standards (NGSS). Teachers will have the option of implementing the NGSS aligned STEM science curriculum with their students thanks to your outreach to their classrooms.

FLEXHIBIT

Curate. Educate. Rotate.

CIRCUIT BENCH

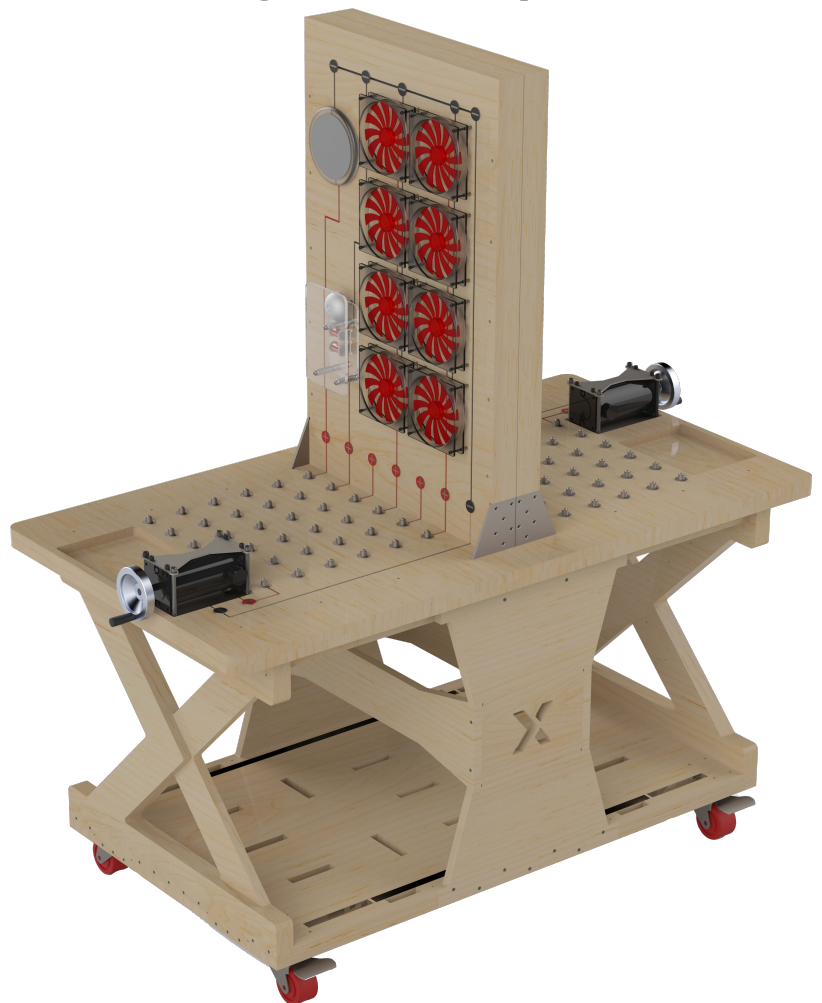
Make it spin, sound off and light up! Connect a maze of circuits to complete a connection with the device you want to power. It's our take on snap circuit. No external power required! User approaches the Circuit Bench Education Outreach STEM Cart and selects a combination of short and long steel bars. The bars are used to make a connection from a marked positive lead to a negative lead on one of the available electronics. The user then cranks the generator to provide low voltage power to operate the items. Explore the amount of energy needed to power up different items. See how activating various components at once changes the effort required at the hand-crank.

STEM Concepts Taught:

- Phenomena of Ohm's Law
- Physical Science Concepts
- Exhibit Technology
- Vernier Technology
- Engineering Concepts
- Math Calculations

STEM Careers:

- Electromechanical
- Engineer
- Electronic Technologist
- Electrical Technician
- Electrical Engineer
- Electrician



Next Generation Science Standards (NGSS) Aligned Unit Plans:

The Circuit Bench Education Outreach STEM Cart includes two lessons aligned with the Next Generation Science Standards (NGSS). Teachers will have the option of implementing the NGSS aligned STEM science curriculum with their students thanks to your outreach to their classrooms.

FLEXHIBIT

Curate. Educate. Rotate.

MAGNETIC BASICS

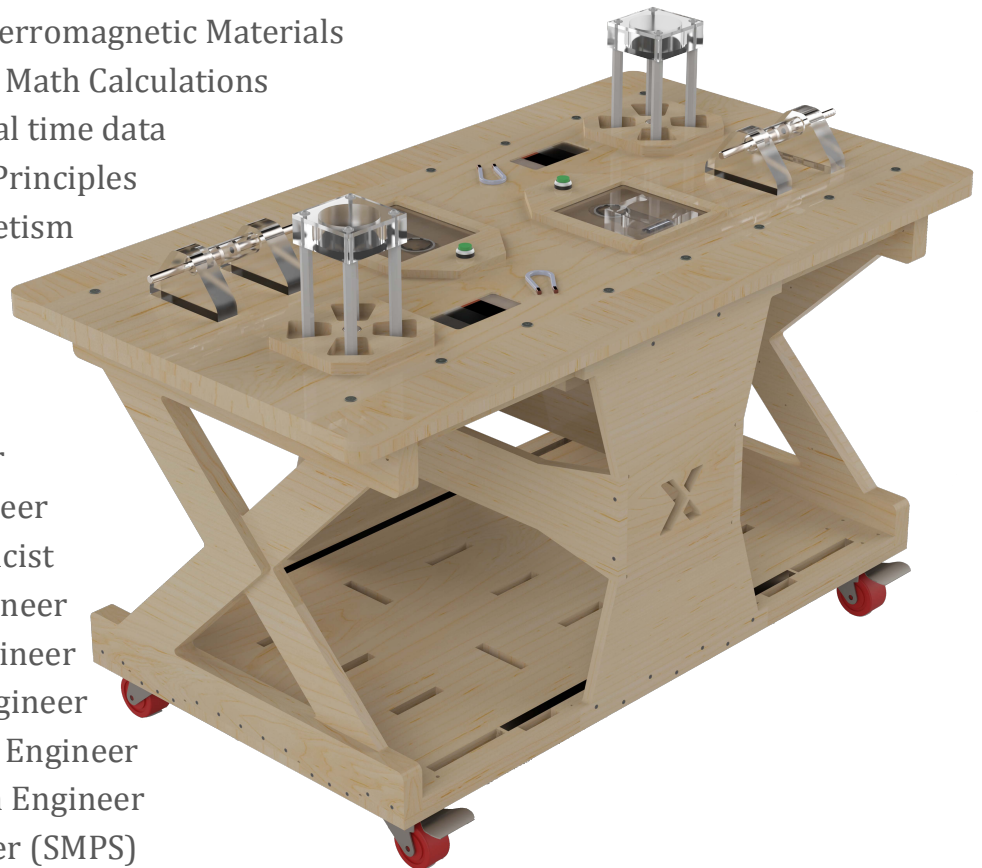
Users use a magnet to find out which materials are attracted to the magnet. The user holds down the button and allows electricity to flow through a wire causing deflection of the compass needle. Move a bar magnet under a fully self-contained acrylic box with a Ferro fluid pond in the bottom. The contained magnets can be pushed from both sides independently to feel the repulsion forces at work. Through hands-on interaction, users are discovering the real-world science that relates to this exhibit, the importance and uses of magnetism and electromagnetism in society.

STEM Concepts Taught:

- Permanent Magnets and Ferromagnetic Materials
- Engineering Concepts and Math Calculations
- Vernier Technology for real time data
- Repulsion and Attraction Principles
- Principles of Electromagnetism
- Fundamental Forces

STEM Careers:

- Electronics Engineer
- Field Application Engineer
- Valve Train Product Engineer
- Magnetic Resonance Physicist
- Gridded Ion Thruster Engineer
- Product Development Engineer
- Magnet Manufacturing Engineer
- Sensing System Hardware Engineer
- EMC Machine Certification Engineer
- Power Electronics Engineer (SMPS)
- Electromagnetic Compatibility Engineer (EMC)



Next Generation Science Standards (NGSS) Aligned Unit Plans:

The Magnetic Basics Education Outreach STEM Cart includes two lessons aligned with the Next Generation Science Standards (NGSS). Teachers will have the option of implementing the NGSS aligned STEM science curriculum with their students thanks to your outreach to their classrooms.

FLEXHIBIT

Curate. Educate. Rotate.

RING LAUNCHER

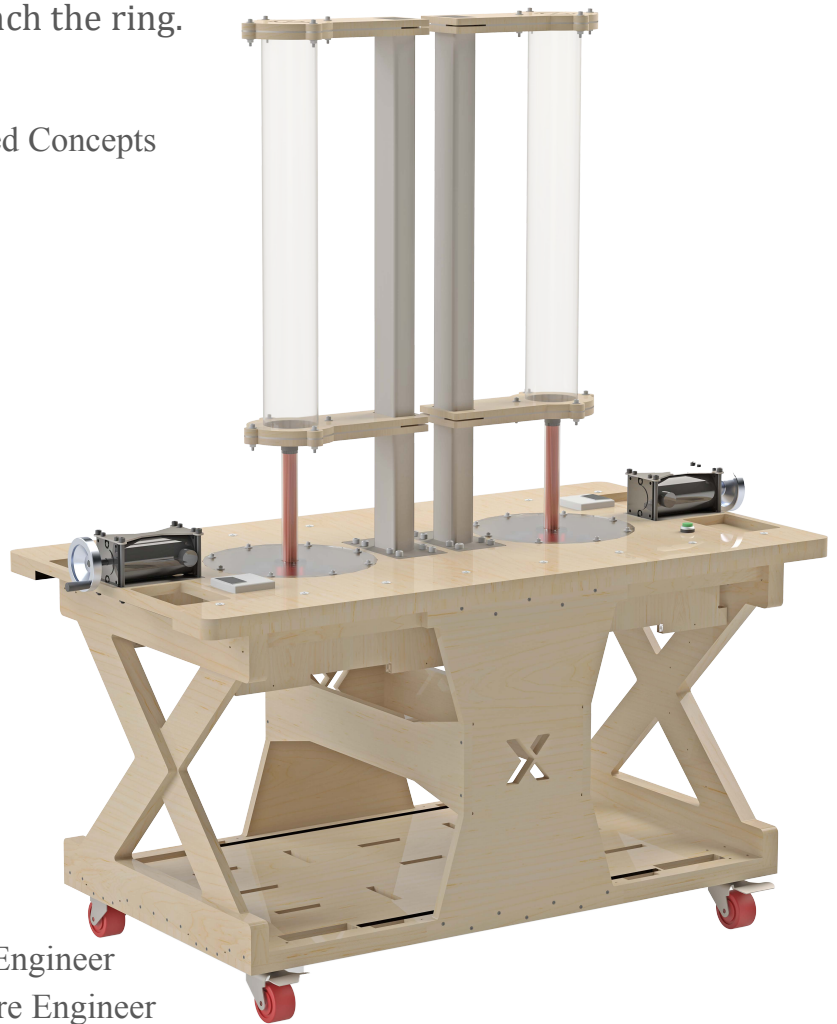
The phenomenon of electromagnetism is experienced first-hand by user interaction with the Ring Launcher Education Outreach STEM Cart. Students using the Ring Launcher can select rings made of various materials and sizes to place on the launch pad. The student then cranks the generator to create an electrical current that will be stored in the capacitors. Once the desired voltage is reached the user presses the green button releasing the stored electrical current, which induces two opposing magnetic fields to push against each other to launch the ring.

STEM Concepts Taught:

- Electricity and Magnetism as Interrelated Concepts
- Magnetism and Force
- Models
- Variables
- Engineering Principles
- Math Calculations

STEM Careers:

- Physicist
- Patent Engineer
- Research Engineer
- Electrical Engineer
- Linear Motor Designer
- Field Lab Tech/Engineer
- Radio Frequency Engineer
- HVAC Instructor/Engineer
- Electromagnetic Actuator Designer
- Electromagnetic Compatibility (EMC) Engineer
- Calibration and Instrumentation Software Engineer



Next Generation Science Standards (NGSS) Aligned Unit Plans:

The Ring Launcher Education Outreach STEM Cart includes two lessons aligned with the Next Generation Science Standards (NGSS). Teachers will have the option of implementing the NGSS aligned STEM science curriculum with their students thanks to your outreach to their classrooms.

FLEXHIBIT

Curate. Educate. Rotate.

QUAKE TABLE

The Quake Table Education Outreach STEM Cart allows users to explore the effects of vibration and movement on physical structures by placing buildings made of various materials on the Quake Table FLEXCART. Children can manually change the frequency of the seismic wave of the table. By changing the frequency of wave, users can test their structures they have built and explore the engineering concepts that will increase their structures ability to withstand large magnitude seismic waves.

STEM Concepts Taught:

- Geology of Earthquakes
- Mechanics of Earthquakes
- Science of Waves
- Earthquake Engineering
- Models
- Human Impact
- Math Calculations

STEM Careers:

- Seismologist
- Geologist
- Earth Scientist
- Geophysicist
- Volcanologist
- Civil Engineer
- Structural Engineer
- Geotechnical Engineer
- Marine Geophysicist
- Geodesist
- Geomagnetist



Next Generation Science Standards (NGSS) Aligned Unit Plans:

The Quake Table Education Outreach STEM Cart includes two lessons aligned with the Next Generation Science Standards (NGSS). Teachers will have the option of implementing the NGSS aligned STEM science curriculum with their students thanks to your outreach to their classrooms.