

Ingenuity Center Mobile STEM Lessons

Mobile STEM lessons are taught by a Texas Master Science certified teacher, and are designed to be applicable to most students in grades 6-12. Materials and questioning will be adapted accordingly. Lessons are intended to focus on the major cross-cutting concepts that have application across all domains of science as opposed to specific individual TEKS. As such, they are a way of linking the different domains of science. They include: **Patterns, similarity, and diversity; Cause and effect; Scale, proportion and quantity; Systems and system models; Energy and matter; Structure and function; Stability and change.**

All lessons include the NAO robot and make extensive use of either hands-on activities, live demonstrations, student participation, audio-visual and technology integration, or a combination thereof. Suggested grade levels are shown for each lesson/activity but most can be adapted to accommodate middle - high school.

Scientific Inquiry and the Scientific Method

- Critical thinking and the application of science, aka "MythBusting" (8-12)
- The scientific method via Diet Coke and Mentos (6-10)

Biology

- Comparison of plant and animal cells: LCD microscopes and wet-mount slides lab (8-12)
- Plant stomata microscope lab: Plants have noses??? (6-10)
- Genetics: Chromosomes and karyotypes; Mendel and meiosis (8-12)
- Human anatomy: Heart-rate lab activity (6-10)
- DNA extraction lab: Strawberries and the code of life (8-12)

Engineering

- Design and testing: Bridge-breaker with Popsicle sticks (6-10)
- Problem solving and team building: Marble wall challenge (8-12)
- The history of robotics: Automaton to androids (6-10)

Chemistry

- Physical versus chemical change: Chemistry demos that wow (6-10)
- Cool chemistry: fluorescent and glow-in-the-dark science (6-10)
- Goopy chemistry: Slime, Gak, and Oobleck (6-10)

Physics

- Newton's three laws: water-bottle rocketry (8-12)
- Energy: forms and transformations (from burning metal to the Van de Graaf generator) (6-10)
- Speed and acceleration: RC cars (6-10)
- Potential and kinetic energy: marble roller-coaster lab (8-12)

Earth and Space

- Earth's Moon: formation and study of (NASA certified lunar & meteorite samples: requests must be made at least 6 weeks in advance) (8-10)
- UV Light lab: Protecting astronauts from the dangers of radiation (6-10)