



American Precision Museum Field Trip Planner 2022-2023

DATES & TIMES: The museum is open to the public from 10 am—5 pm daily. We can, however, accommodate school groups before 10 am upon request.

FEES: Fieldtrips cost \$4 per student. Adult chaperones are free (including bus/van drivers).

ACTIVITIES: We typically organize school visits around a series of relatively short (roughly 30 minutes each) hands-on activities. Generally, these activities are centered around a theme or topic, several possibilities of which are discussed below in more detail. The theme that links the hands-on lessons together also provides a framework for exploring the museum’s main gallery, including the machines and demonstrations that we focus on.

SCHEDULING: Send an email to ldorsey@americanprecision.org to design and schedule your fieldtrip.

TOPICS:

Energy Transfer

*This tour is suitable for students in grades K- 8 and usually takes 60-90 minutes. *
We recommend discussing the Key Words before your visit.*

Key Words: line shaft, pulley, mill, transfer, water wheel

Career Context: Hydroelectric Engineer, Solar Engineer.

What to look for during your tour: blueprints, water wheels.

Hands-on Activities: Experimenting with Energy kit; dynamo and motor; wind chime.

Demonstration: Manual Gear Shaper

Basic question: What are other forms of energy transfer that you see in your daily life?

Advanced question: Can you think of a few ways the museum can save energy?

NGSS Core: Forces and Motion (PS2A, B)

Repeatability

*This tour is suitable for students in grades K- 8 and usually takes 45-60 minutes. *
We recommend discussing the Key Words before your visit.*

Key Words: tolerance, precision, accuracy, interchangeable, handmade, machine-made

Career Context: Hydroelectric engineer, Solar Engineer.

What to look for during your tour: blueprints, water wheels.

Hands-on Activities: Achieving Repeatability kit, pen assembly and disassembly, find the “best” way to draw a circle.

Demonstration: Manual Gear Shaper.

Basic question: What are other forms of energy transfer that you see in your daily life?

Advanced question: Can you think of a few ways the museum can save energy?

NGSS Core: Forces and Motion (PS2A, B)

Measurement

*This tour is suitable for students in grades K - 12 and usually takes 30-60 minutes. **

We recommend discussing the Key Words before your visit.

Key Words: tolerance, precision, accuracy, interchangeable, "replace a part"

Career Context: Additive and Precision Manufacturing, Race Car Tech Inspector.

What to look for during your tour: Pattern Tracing, Indexing Machines

Hands-on Activities: Draw a widget challenge, find the "best" way to draw a circle, use an optical comparator shadow puppets to compare paperclips, Measure the World Kit

Demonstration: Haas with D-Tect It; 3D printer

Basic question: Why do we measure time, weight, hardness, distance, power, or speed?

Advanced question: How does the Internet of Things (IoT) change how we measure?

CCMS: N-MD Measurement and Data

Simple Machines

*This tour is suitable for students in grades K - 12 and usually takes 30-60 minutes. **

We recommend discussing the Key Words before your visit.

Key Words: lever, inclined plane, screw, wedge, axle, gear train, pulley, pendulum

Career Context: Engineers, Manufacturers, Designers, Architects.

What to look for during your tour: How do each of the six simple machines appear in the tools and equipment in the museum's gallery.

Hands-on Activities: Handheld Gear Devices, Styrofoam Catapult

Demonstration: Fellows Gear Shaper

Basic question: How can you lift more weight with a lever?

Advanced question: Can you define 'mechanical advantage' and 'ideal mechanical advantage'?

NGSS Core: Forces and Motion (PS2A, B) Definitions of Energy (PS3A, B)

*Given sufficient notice (at least a week) the constraints and content of each tour can be customized to your classroom's interests, size, and grade level. The topics above function primarily as jumping-off points. We are more than happy to work with you to modify them or create new ones.