Equipment Descriptions



Item: Mini-milling machine Level: High school (could be used at other levels) Topic: Subtractive manufacturing Lesson status: In progress Expected uses: Engineering design projects Availability: 1 unit Video available?: No Considerations: Requires 2.5 feet x 2.5 feet counter space, 110V power (standard outlet) and laptop with software (provided). Cutting time will vary depending on design. Coordinate ahead of time to ensure the correct media (wood, tile and plastic) are available.



Coordinate ahead of time to ensure the correct media (wood, tile and plastic) are available. Item: 3D printer Level: High school (could be used at other levels) Topic: Additive manufacturing Lesson status: Featured in 5th and 7th grade lessons. Expected uses: Engineering design projects Availability: 1 unit Video available?: No Considerations: Requires 1.5 feet x 1.5 feet counter space, 110// power (standard outlet) and lanton with software

110V power (standard outlet) and laptop with software (provided). Building time will vary depending on design. Requires an object file; designs may need to be converted to the correct file type ahead of time.

Item: UV-Vis Spectrophotometer Level: High school (could be used at middle school) Topic: Waves / Light / Energy Lesson status: Unit plan available – Mining remediation (AP Environmental Science) Expected uses: Chemistry (chemical structure, chemical purity), Physics (wavelength / absorbance), Biology (DNA

purity), Physics (wavelength / absorbance), Biology (DNA purity), Forensics (compound identification) **Availability:** 1 unit

Video available?: No

Considerations: Requires 2 feet x 2 feet counter space, 110V power (standard outlet) and laptop with software (provided). Can measure at specific wavelengths or perform a full spectrum scan. Output can be absorbance or transmittance. Calibration curve must be made ahead of time if the goal is to measure concentration. Coordinate ahead of time if specific chemicals are needed.





Item: Solar Thermal Water Heater Level: High school (best fit = Geoscience) Topic: Renewable energy Lesson status: Unit plan available - Human Sustainability (NGSS-aligned) Expected uses: Renewable energy lesson, engineering design lesson Availability: 2 units; accompanied by materials for 7 groups to build their own thermal panels. Video available?: Yes Considerations: Must be used outdoors on a sunny day.

Requires water and may involve small water spills (outdoors).

Item: Off-grid Energy System Level: Middle school (could be used at other levels) Topic: Renewable energy Lesson status: Activity guide available Expected uses: Renewable energy lesson Availability: 3 units Video available?: Yes Considerations: Must be used outdoors on a sunny day.



Item: Solar Energy Fan & Light Kit Level: Elementary - 4th grade (could be used at other levels) Topic: Renewable energy Lesson status: Unit plan available - connects to 4th grade FOSS kit (NGSS-aligned) Expected uses: Renewable energy lesson Video available?: Yes Availability: 9 units Considerations: Must be used outdoors on a sunny day.



Item: Water Filtration Kit

Level: Middle school - 6th grade (could be used at other levels) Topic: Water cycle / water treatment / hydrology Lesson status: Unit plan available - 6th grade (NGSS-aligned) Expected uses: Water cycle and water treatment lessons Availability: 4 units Video available?: No

Considerations: Involves water and may result in small water spills. Towels are provided. Designed to sit on a table top or desk. Requires access to a power outlet for the pump.



Item: Anemometer Level: Middle school - 6th grade (could be used at other levels) Topic: Wind and weather Lesson status: Unit plan available - 6th grade (NGSS-aligned) Expected uses: Wind speed and wind measurement lessons Availability: 2 anemometers and 2 table top fans. Video available?: No

Considerations: Can be used outdoors on a windy day or indoors with a fan. We can provide a fan.

Item: Surveying Equipment

Level: Elementary - 5th grade (could be used at other levels)
Topic: Land surveying
Lesson status: Unit plan available - 5th grade (NGSS-aligned)
Expected uses: Measuring slopes, distances and heights.
Develop contour maps.

Availability: 3 tripods, 1 theodolite, 1 level, 2 rods/staffs, 1 tribrach, 1 tape, 1 plumb bob and 1 reflective object. **Video available?:** No

Considerations: Must be used outdoors. Requires expertise of Tech Trekker staff (minimum 2 people).



Item: Solar Audio Kit Level: High school - Physics Topic: Waves (light and sound) Lesson status: Activity guide available Expected uses: Waves (light and sound production lessons) Availability: 11 units Video available?: Yes

Considerations: No shock hazard. Extra caution needed with fragile items to avoid breakage or electrical damage. Minimum 30 minutes to complete the activity. Works in groups of 2-4.



Item: Mini-landslide Level: Middle school - 7th grade (could be used at other levels) Topic: Erosion and flooding Lesson status: Unit plan available – a component of the 7th grade lesson (NGSS-aligned) Expected uses: Lessons on erosion and flooding Availability: 8 units Video available?: Yes Considerations: May require cleaning surfaces due to water spill. Towels are provided.



Item: Slope Stability Level: Middle school - 7th grade (could be used at other levels) Topic: Erosion and flooding Lesson status: Unit plan available – a component of the 7th grade lesson (NGSS-aligned) Expected uses: Lessons on erosion and flooding Availability: 8 units Video available?: Yes Considerations: May require cleaning surfaces due to water spill. Towels are provided.





Item: Stream table Level: Middle school - 7th grade (could be used at other levels) Topic: Erosion and flooding Lesson status: Unit plan available – a component of the 7th grade lesson (NGSS-aligned) Expected uses: Lessons on erosion and flooding Availability: 8 units Video available?: Yes Considerations: May require cleaning surfaces due to water spill. Towels are provided.

Item: Infrared Thermal Imaging Camera Level: Elementary - (could be used at other levels) Topic: Energy, light waves, and material properties Lesson status: Unit plan available – K-2nd grades (NGSS-aligned) Expected uses: Energy and light lessons, engineering design activity Availability: 1 unit Video available?: No Considerations: Shade structures from engineering design activity need to be tested outdoors or near a window.



Item: Raspberry Pi and Seismic Sensors Level: Middle school - 7th grade (could be used at other levels) Topic: Earth systems and processes, natural disasters Lesson status: Unit plan available – a component of the 7th grade lesson (NGSS-aligned) Expected uses: Lessons on tectonics and earth systems Availability: 4 units Video available?: No Considerations: Device needs to remain in a secure location for several days to collect data. Wifi access needed.