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  
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.

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  
Considerations: Requires 1.5 feet x 1.5 feet counter space, 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), Forensics (compound identification)  
Availability: 1 unit  
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 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.  
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  
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  
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  
Considerations: Involves water and may result in small water spills. Towels are provided.
**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.  
**Considerations:** Can be used outdoors on a windy day or indoors with 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.  
**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  
**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  
**Considerations:** May require cleaning surfaces due to water spill. Towels are provided.