GREEN POWER

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Training

Smart Agriculture Kit

Product Details

Classroom-ready hardware kits with all the hardware needed for Microsoft FarmBeats for Students lessons. Learn about data-driven farming using AI, Machine learning and IoT with free curated curriculums and lessons from Microsoft. Students can immerse themselves with hands-on activities and build a garden monitoring system with this kit.

Includes:

- **Easy-to-use and low-cost hardware kit : combines an affordable hardware kit with FREE curriculums and activities for students ' hands-on experience in precision agriculture techniques to food production.**
- **New tools for STEAM Education learners : students learn about AI, machine learning, and IoT by building a garden monitoring system.**

- **Equipped with Raspberry Pi 4 :** with atmospheric and environmental sensors to understand their soil's health, analyze data, and make decisions.
- **Real-time data collection :** The student-built IoT devices connect to custom Microsoft Excel workbooks that collect real-time data using Excel's Data Streamer.
- **Build your own Machine Learning models :** using Lobe.ai , students apply the technique to predict nutrient deficiencies in their plants and identifying pests in their garden.
- **Introducing Microsoft responsible AI framework :** engaging students with some of the social and ethical challenges raised by this new technology.

Today's farms are beginning to look a lot more like smart cities. Growers are using modern techniques like sensors, computer vision, and artificial intelligence to acquire a more complete view of their crops. These methods help them make better decisions, discover inefficiencies, and unlock new insights into improving food production. Seeed is honored and pleased to collaborate with Microsoft in the <u>FarmBeats for Students Program (FBFS)</u> , which brings these modern tools into the hands of today's learners.

The FarmBeats for Students Program combines an affordable hardware kit with curated curriculums and activities designed to give students hands-on experience in applying precision agriculture techniques to food production. The learning progression enables students to easily see the connections between these modern agriculture tools and the opportunities they afford .

The FarmBeats for Students Program combines software, an affordable hardware kit - the Grove Smart Agriculture Kit with FREE curricula and activities designed to give students hands-on experience in applying precision agriculture techniques to food production.

This Grove Smart Agriculture Kit is a hardware kit that consists of an array of multiple sensors measuring soil temperature, soil moisture, sunlight, and air temperature & humidity, etc., the parameters that are crucial for plant growth. With a relay, you can also configure the hardware kit with other hardware modules, to further extend the function from monitoring to controlling such as turn on/off the switch for irrigation or turn on/off the lighting.

With the combination of software, hardware kit, and curricula resources, the students get a hands-on and immersive experience in the process of learning, to learn about sensor technology, how the changes of data collected from different sensors affect the growth of the crops. ; thus they understand soil condition and crop health, etc., and make better decisions with data-driven insights.

Connect to Excel Data Streamer
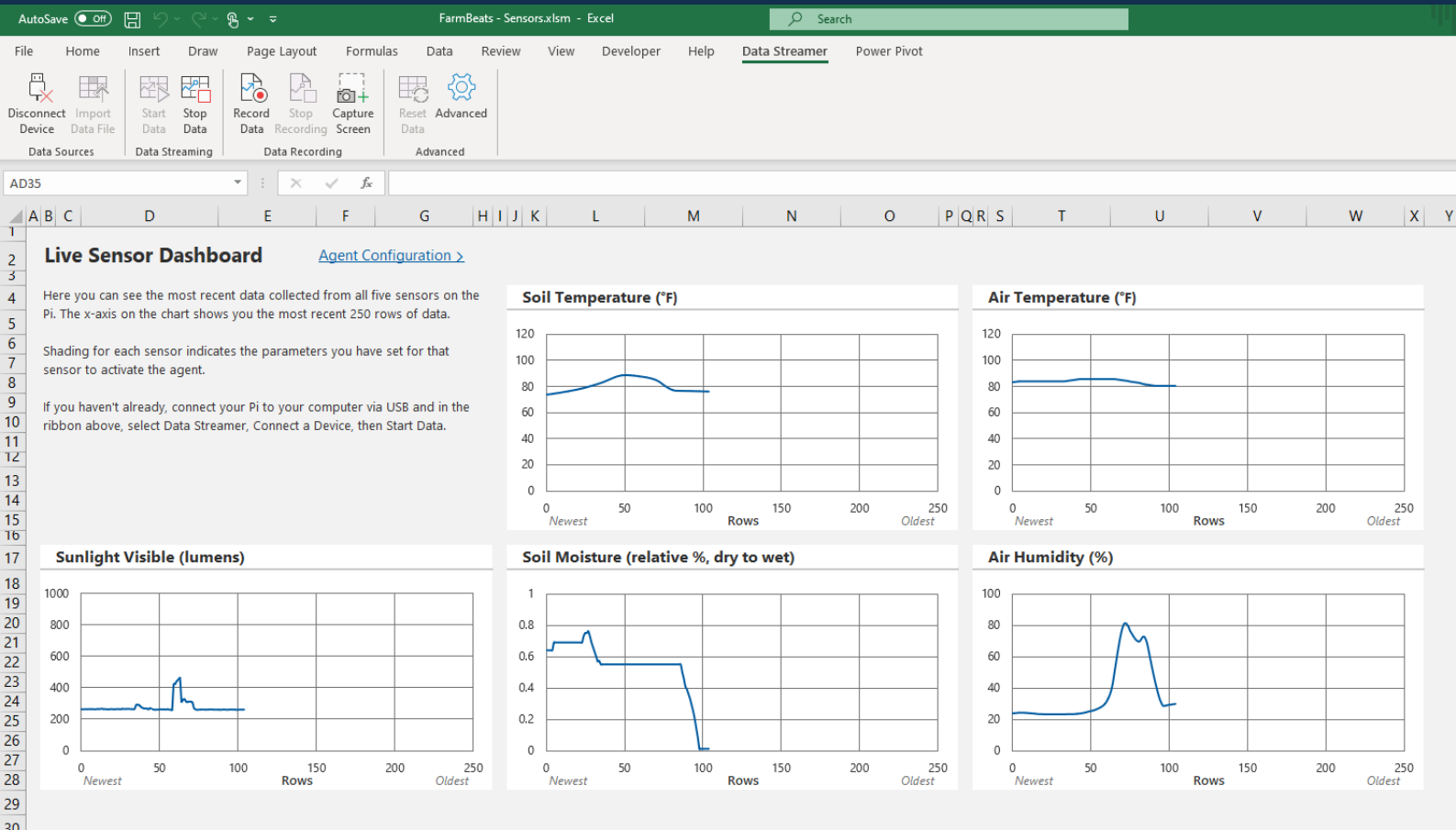
They assemble a Raspberry Pi equipped with atmospheric and environmental sensors to understand their soil's health, understand the environmental parameters that affect plant growth, analyze the data, and make decisions. The student-built IoT devices connect to custom Excel workbooks that collect real-time data using Excel's Data Streamer. They can see the visualized data and further analyze it, thus they can gain insights and make data-driven decisions for their crops.

Use Lobe.ai to build Machine Learning Models

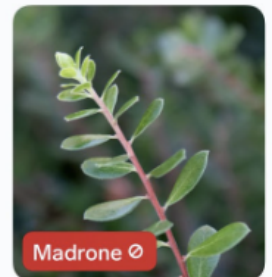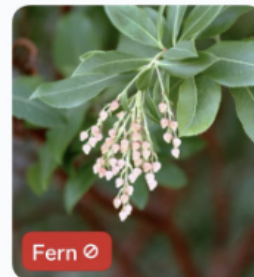**GREEN POWER**
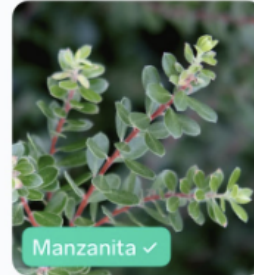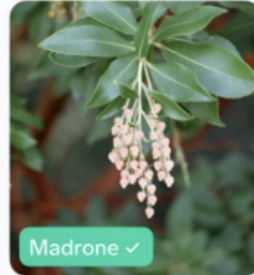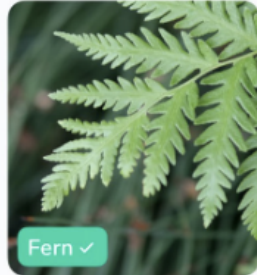
With Lobe.ai, students are introduced to building their own Machine Learning models. They build, train, and apply machine learning models to predict nutrient deficiencies in their plants, and identifying pests in their garden. There are activities where students set up an agent and others where they work with a curated big data set. The learning progression enables students to easily see the connections between these modern agriculture tools and the opportunities they afford.

Part List

Product Name	Quantity
Raspberry Pi 4 Computer Model 2GB V1.2	1
Wall Adapter Power Supply	1
Grove Base Hat for Raspberry Pi with a Fan	1
One Wire Temperature Sensor	1
Grove-Capacitive Soil Moisture Sensor	1
Grove-Sunlight Sensor	1
Grove Temperature & Humidity Sensor	1
Grove-Relay	1
Grove - Dual Button	1
micro SD Card with Card Reader - 32GB	1
USB to TTL Serial Cable	1
Screwdriver	1

Applications

Combined with software and curriculum & resources, you can get hands-on experience, learn about artificial intelligence, machine learning, the Internet of Things, data science and then apply the knowledge in growing plants in the real world.

You can get hand-on experience and learn about artificial intelligence, machine learning, IoT, and data science:
- at home
- in classroom
- from distance learning courses

This kit is highly suitable for use in different scenarios, no matter in the classroom, at home, at maker spaces/ fab labs or through distance learning courses:
- School garden monitoring
- Home garden monitoring
- Distance teaching /learning
- Online courses
- Hobby and DIY projects

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