



Welcome to

FarmBeats for Students

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. The FarmBeats for Students program brings these modern tools into the hands of today's learners.

Program Overview

The program combines an affordable **hardware kit with curated curriculum 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.**

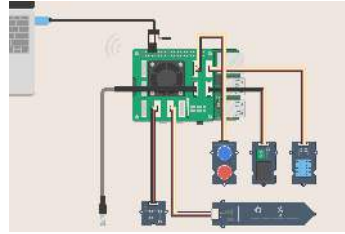


FarmBeats for Students

Precision Agriculture Experiences for School and Home
aka.ms/farmbeatsforstudents

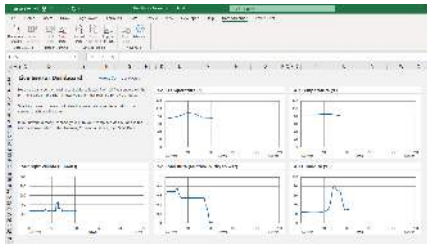
Learning Progression

Using the **FarmBeats for Students program**, students learn about AI, Machine Learning, and the Internet of Things (IoT) by building a garden monitoring system.

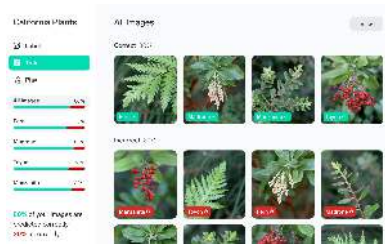


Raspberry Pi with sensors kit

They assemble a **Raspberry Pi** equipped with atmospheric and environmental sensors to understand their soil's health, analyze data and make decisions. Using **Microsoft Excel**, they construct an agent to react to soil conditions and engage with big data sets to extract intelligence about the best greenhouse locations. Using **Lobe**, they build their own machine learning models, applying the technique to predict nutrient problems in their plants and identify pests in their garden.

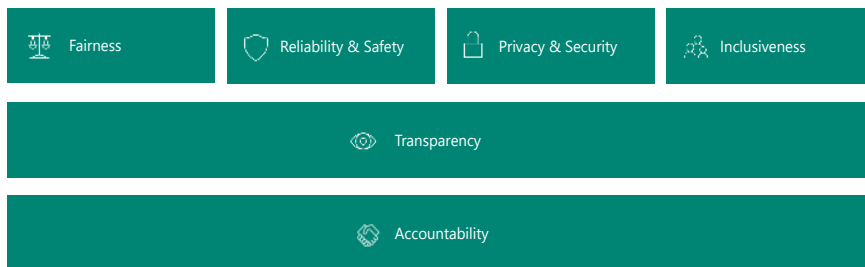


Visualize and analyze with Excel workbooks



Train machine learning models with Lobe

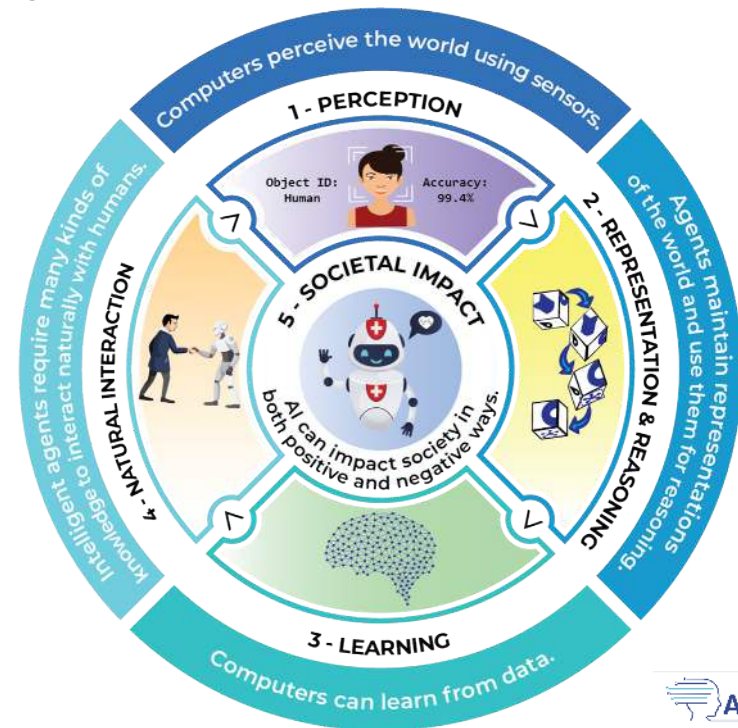
The course ends by introducing **Microsoft's Responsible AI Framework** and presents a discussion about some of the social and ethical challenges raised by this new technology.



Microsoft's Responsible AI Framework

Academic Alignment

All agricultural concepts and performance objectives in these activities are associated with the **Learning Objectives (LO)** and **Enduring Understanding (EU)** at grade levels 9 – 12 from the AI4K12 5 Big Ideas. The curriculum is also aligned to **CSTA Standards**, **National AFNR Common Career Technical Core Standards**, **Next Generation Science Standards**, and **Common Core State Standards** for high school math.



'Five Big Ideas in AI' infographic by AI4K12, <https://ai4k12.org/resources/big-ideas-poster/> is licensed under CC BY-NC-SA 4.0 license, <https://creativecommons.org/licenses/by-nc-sa/4.0/>.

Software Requirements



Program Support

Stacey Wood
v-stwood@microsoft.com

