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.

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.
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. 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.

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.

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.

Software Requirements

- DATA STREAMER
- EXCEL O365 DESKTOP
- WINDOWS 10

Program Support

Stacey Wood
v-stwood@microsoft.com

‘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/.