AI Literacy for Young Learners with VEX 123

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VEX 123

Workshop Goals

- Provide tools for introducing fundamental AI concepts to young learners using a robot.

- Experience easily implemented activities that help students understand the AI4K12 Big Idea of Perception

Research-Based

- Co-design project with CS Everyone Center from University of Florida and the Woodland Hills, PA School District

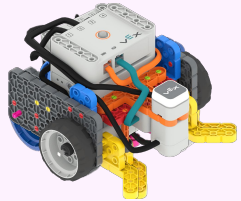
- PD+ Insights Article: Bring AI Literacy to Your K-5 Students with VEX 123 and VEX GO

The VEX Continuum

VEX 123

Coding Starts Early

Ages 4+



VEX GO

STEM Starts Early

Ages 8+

VEX AIM

Real World Coding

Ages 8+

VEX IQ

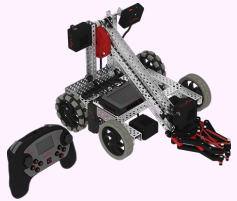
Applied STEM Learning

Ages 11+

VEX EXP

Real World STEM for Classrooms

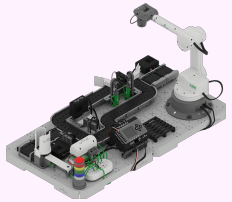
Ages 14+



VEX V5

Real World STEM for Competition

Ages 14+



VEX CTE

Workforce Readiness

Ages 14+

VEX AIR

STEM Skills Take Flight

Ages 14+

VEX CODE VR

Virtual Robot Coding

Ages 8+

Is it AI or NOT AI?

Place yourself on the line:

100% Definitely AI.....0% Definitely NOT AI

Siri

Spotify

Refrigerator

Nintendo

Why Teach AI to Young Learners?

- AI is an integral part of computer science
- To ensures *all* students have the chance to explore career paths in fields like computer science, robotics, data analysis, and software
- To equip students with the knowledge to grasp its potential and make responsible, informed decisions about its use

Artificial Intelligence (AI) *is when people teach computers and robots to learn, think, and make decisions like humans do.*

123 Robot

Why Teach AI with a Robot?

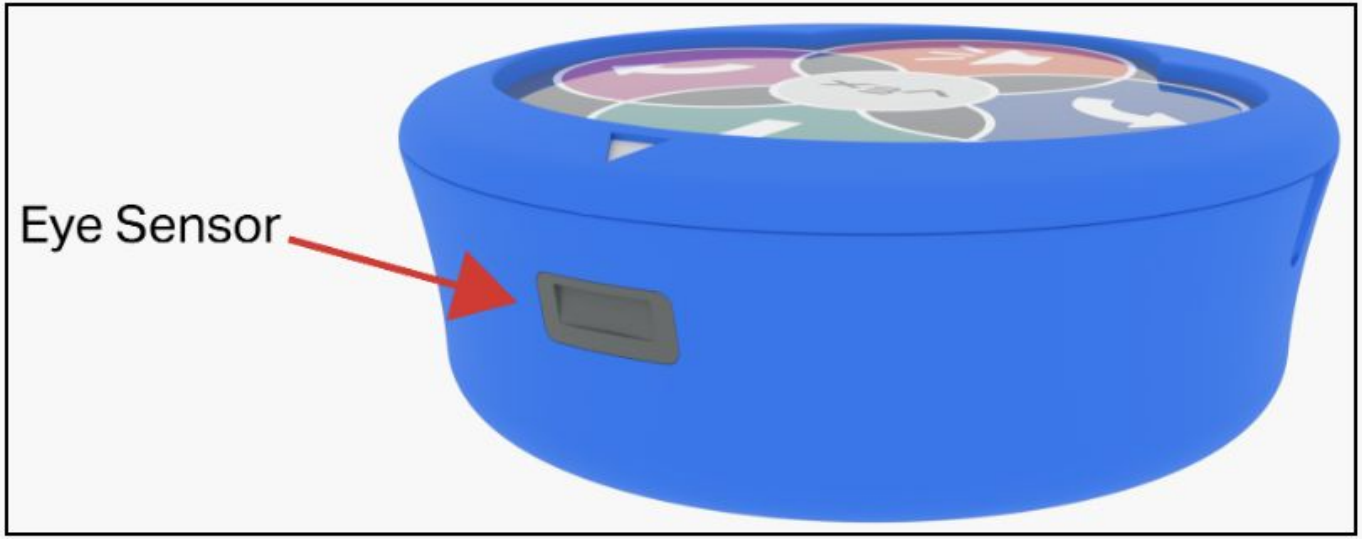
- Fundamental AI concepts can be made tangible using robots.
- Teaching AI with a robot turns challenging abstract concepts into concrete, hands-on learning experiences.

Perception

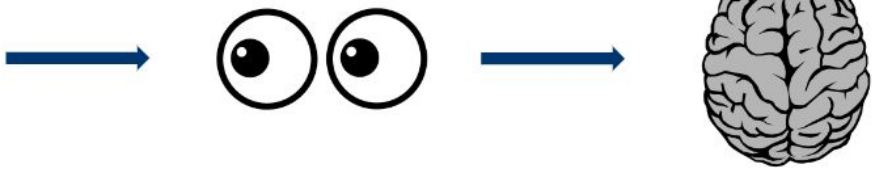
What is a sensor?

How does computer sensing differ from human sensing?

How does a robot perceive the world around it?



Human Vision



Sheep Dog

vs.

62% Sheep Dog
35% Mop
3% Rug

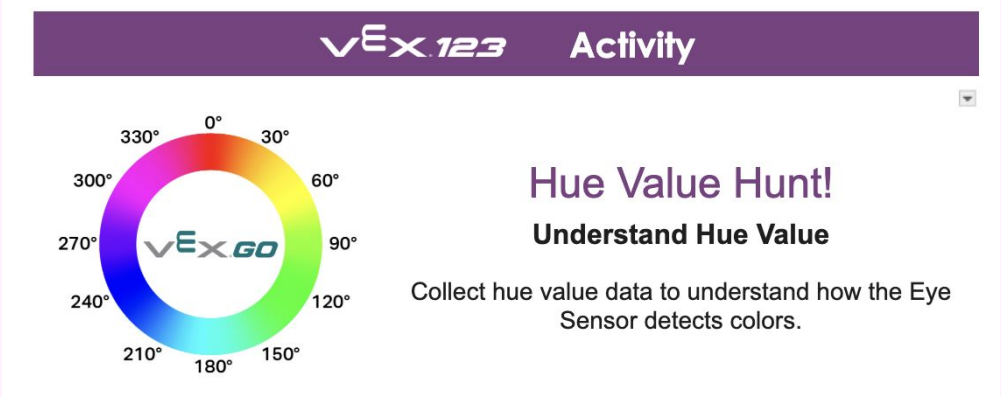
Computer Vision

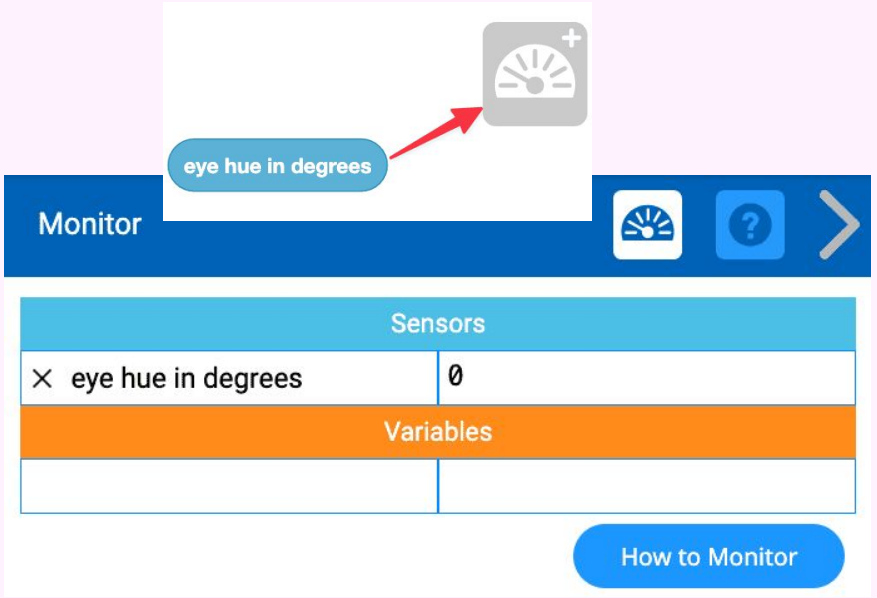
Perception - AI4K12

Perception is the extraction of meaning from sensory information using knowledge.

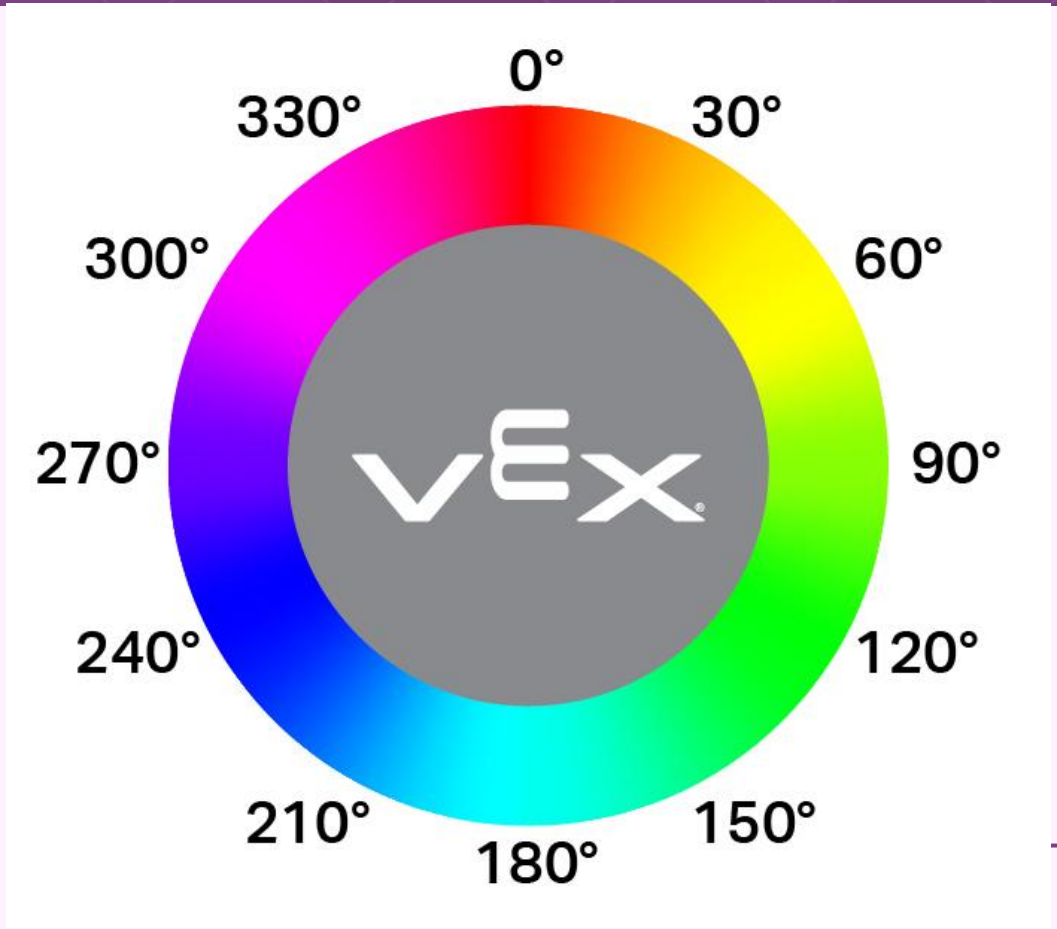
Hue Value Hunt

- Be sure your robot is connected.
- In VEXcode 123, open the Monitor Console and drag the Eye Hue block to the Monitor icon.
- Place objects in front of the robot's Eye Sensor
- What hue value reading is reported?
- Test at least 5 things, and record your data.



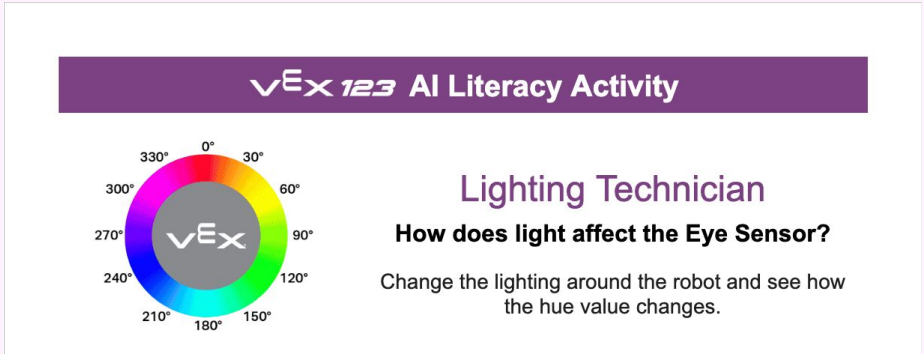


Hue Value Chart

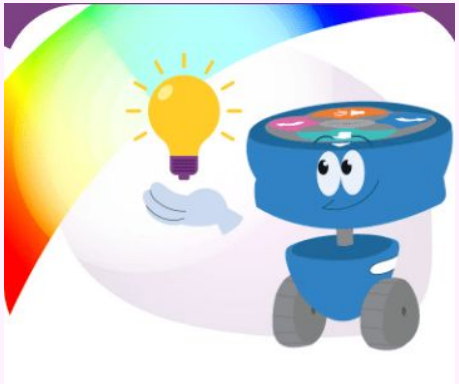


Lighting Technician

- Be sure your robot is connected.
- In VEXcode 123, open the Monitor Console and drag the eye hue block to the Monitor icon.
- Take a hue value reading of an Art Ring using the lighting where you are seated, and record it.
- Move around the room and collect 4 more readings in a variety of lighting situations.



- Take a reading with the Eye Sensor's light on!
- How does that change your reading?



Set eye light

Reflection

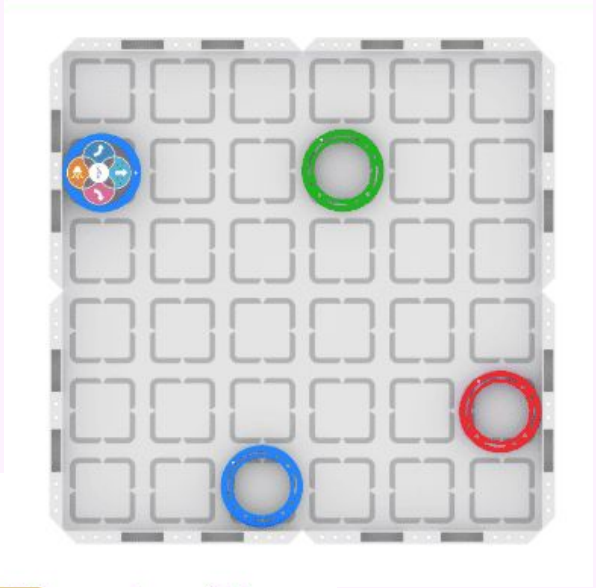
- How could you use what you learned about the Eye Sensor in the last two activities when teaching with the Eye Sensor?

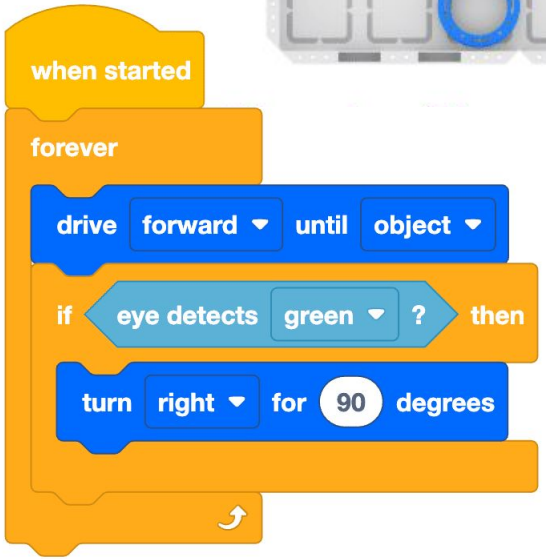
- How would you use it to help students understand the difference between human and robot perception?

- How could you connect the idea of how robots perceive the world to how AI works for your young students?

Code a Course

- Set up your Field as shown to the right.
- Build the project to the right.
- What do you think will happen?
- Add on to the project so the robot navigates the maze using the Eye Sensor.
- The robot should:
  - Turn right at the green Art Ring
  - Turn left at the blue Art Ring
  - Stop at the red Art Ring





Code a Course Setup

Mystery Planet

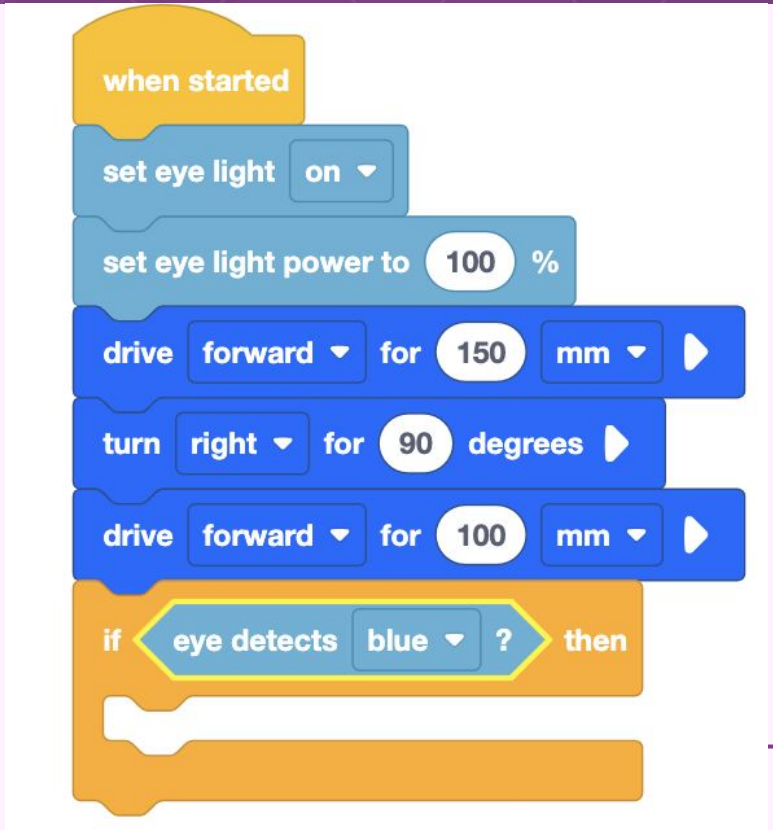
Create an Alien Planet

Green - Aliens

Blue - Water

Red - New Elements

Mystery Planet



Mystery Planet Mapper

- Your goal is to build a project where the 123 Robot finds the clean water (the blue Art Ring) on a mystery alien planet. *The mystery? You can't see the planet!*
  - Use the Eye Sensor to identify the blue water.
  - Use a Play sound block to show that the robot found the water.

- Have another group set up your Field. Don't peek at the mystery planet!
- The other group should place one red, one blue, and one green Art Ring along one side of the Field. Keep the order of the Art Rings a secret by covering them with a box!

Wrap Up

- How do you think these activities help to develop students' understanding of the differences between human and robot perception?
- How would you use these activities to help answer questions students may have about AI?
- How do these activities help to build young students' understanding of making data-based decisions when coding?
- How can these activities help students to understand how AI systems can make mistakes, or misinterpret data?
- What is the one big idea about AI that you would like students to take away from the experience of completing these activities?

Stay Connected

Let's Connect!

Tag me in the **VEX PD+ Community!** @Aimee_DeFoe

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- Insights Article: A New Way to Define "Defining the Problem"