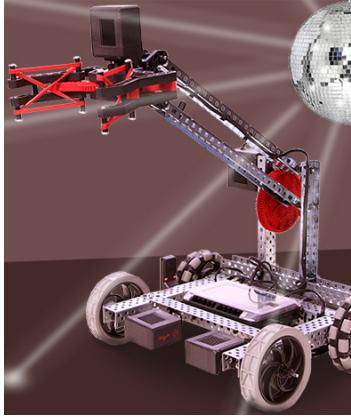


V5 Preview: Loop, There It Is!

12-18 years old | 45 minutes - 4 hours, 45 minutes | Intermediate



Description

Learn how to program loops to get your robot grooving!

Key Concepts

Programming Loops, Robot Behaviors, Analytical Thinking

Objectives

- Analyze building directions and create a robot to complete a specific task.
- Analyze directions to configure and program a robot to complete a series of tasks.
- Explain and use loops to create a project with repeated movements.
- Create a project that follows a specific student created pseudocode that will direct their robot to dance.

Materials needed

- 1 or more VEX V5 Classroom Starter Kits
- Roll of tape
- Meter stick
- Engineering Notebook
- VEXcode V5 Blocks or VEXcode V5 Text

Facilitation Notes

- Ensure all required parts for the build are available prior to starting this STEM Lab.
- Make sure that there is ample space in the classroom to measure out and tape the layout of the "dance floor" that will be used in the activity.
- Make sure that your robot is configured for a robot with 2 V5 Smart Motors plugged into Ports 1 and 10. If your robot is configured differently, you can make adjustments in the Robot Config view of either VEXcode V5 Blocks or VEXcode V5 Text, depending on which you are using.
- If multiple students will be downloading their saved projects to the same robot, have the students add their initials to the name of the saved project (For example, "Forward and Backward_MW). This way students can find and make adjustments to their projects and not others.
- An engineering notebook can be as simple as lined paper within a folder or binder. The notebook shown is a more sophisticated example that is available through VEX Robotics.
- Students can share their pseudocode with the teacher for feedback prior to creating the project.
- The approximate pacing of each section of the Stem Lab is as follows: Seek- 155 minutes, Play- 45 minutes, Apply- 15 minutes, Rethink- 65 minutes, Know- 5 minutes.

Further Your Learning

Health

Have students write about the benefits of dance and other low-impact exercises.

Science

When finding a good source of pollen, honeybees complete a "waggle dance" to communicate the directions to the other bees of the hive. Have the students conduct research on this subject and see where else "dance" is used in nature for communication purposes.

Educational Standards

Standards for Technological Literacy (STL)

- 9.H: Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions (Rethink)
- 11.I: Make a product or system and document the solution (Play and Rethink)

Next Generation Science Standards (NGSS)

- HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering (Rethink)

Computer Science Teachers Association (CSTA)

- 1B-AP-10: Create programs that include sequences, events, loops, and conditionals (Play and Rethink)
- 2-AP-10: Use flowcharts and/or pseudocode to address complex problems as algorithms (Rethink)
- 2-AP-19: Document programs in order to make them easier to follow, test, and debug (Rethink)

Common Core State Standards (CCSS)

- RST.9-10.3: Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text (Build and Play)
- MP.5: Use appropriate tools strategically (Rethink)
- MP.6: Attend to precision (Seek, Play, and Rethink)

TEKS

- 126.40.c.5.A: Develop algorithms to control a robot, including applying instructions, collecting sensor data, and performing simple tasks (Play and Rethink)
- 126.40.c.5.B: Create maneuvering algorithms to physically move the location of a robot (Play and Rethink)
- 126.40.c.3.G: Document a final design and solution (Rethink)
- 126.40.c.3.H: Present a final design, testing results, and solution (Rethink)