

# New Year for the Trees

## A KIBO Lesson for Tu B'shevat

### Powerful Ideas of Computer Science: Representation & Modularity

**Overview:** This lesson celebrates the holiday of Tu B'shevat as "New Year for the Trees." Students will create representations of trees in their different seasonal appearances. They will then program their KIBOs to help the trees grow and thrive throughout the year.

**Learning Goals:** Students will:

- Understand that Tu B'shevat celebrates the **growth of trees** through the seasons, and that people can help trees grow.
- Create a KIBO program that uses **output** to express an idea.
- Understand the function of KIBO's **sound** and **light** output commands and parts.

**Materials/Resources:**

- One KIBO 15 kit or higher per group of 2-4 students
- A variety of art, craft, and recycled materials for building and decorating.
- *The Giving Tree* by Shel Silverstein (or an alternative book of your choice)



**New to KIBO? Watch the Videos!**

If this is your first time using KIBO, we encourage you to check out our short tutorial videos at [kinderlabrobotics.com/getting-started](http://kinderlabrobotics.com/getting-started).

### Lesson Plan



**Inspire (opening circle):** "Today we will celebrate Tu B'shevat. Sometimes this day is called New Year for the Trees. Trees grow and change throughout the year. Trees look different in spring, summer, fall, and winter. Today we celebrate a new year starting for the trees." Ask the children to describe the ways that trees look during different times of the year. Write their observations and memories on the board.

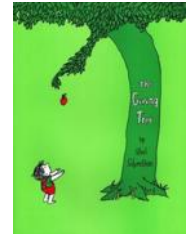
"Trees need lots of different things to grow and be healthy. Some of these are the same things we need, like clean air and water. What are some other things trees need? How can people help trees?" Ask the children to share their ideas.



“KIBO would like to help the trees grow! How can KIBO help?” Demonstrate KIBO’s light bulb and WHITE LIGHT ON command. KIBO can shine a light to help the tree grow! How else might KIBO help the trees? KIBO could sing, or plant seeds, or clean up trash. Write the children’s ideas on the board.



**Connect: Read *The Giving Tree* by Shel Silverstein.** This book explores all the things a tree gives to a beloved child as the child grows up, asking us to reflect on balances and imbalances in our relationships with nature and other people. Talk with the children about their appreciation for the many things that trees give to people (such as fruit, wood, shade, air to breathe, and more).



**Small-Group Work: A Year of Trees.** Student groups will design helper robots to support the trees through the year.

First, have the class work together to create four trees (with drawings, paper cutouts, craft constructions). One tree represents each season. Refer back to the children’s observations about seasonal tree changes that you recorded during circle. Place the trees near each other on the floor, with space for KIBO to navigate among them.

Next, groups (2-4 children with one KIBO per group) work together to design a KIBO “tree helper.” Each group programs their KIBO to travel from one tree to the next in season order: spring, summer, fall, winter. At each tree, KIBO acts out helping the trees in some way: a blue lightbulb could represent giving water, or shaking could represent planting a seed. KIBOs light and sound output commands (such as the SING block) work well for this expressive behavior. Optionally, KIBO could also collect items from the trees, such as collecting fruit from the tree in summer or fall.

Children can also use arts and crafts materials to decorate their KIBO as a tree helper such as a child, a forest animal, or whatever inspires them.

Encourage older students or students who are familiar with KIBO programming to include repeat loops in their programs. A REPEAT: 4 loop could allow KIBO to perform the same helping steps at each of the four trees; or a REPEAT: FOREVER loop around the whole program could represent helping the trees every year.



**Reflect: Helping the Trees** Gather and give each group an opportunity to share their creation with the rest of class. Encourage them to explain the steps in their program and what helpful actions their KIBO commands represent. How do the actions of their helper robot help the trees? Close by asking children to share their ideas about how a healthy environment of water, air, and land helps the trees and helps us. When something is wrong in the environment, what can we do?

### Standards Addressed

**CSTA K-12 Computer Science Standards:** 1A-AP-10, 1A-CS-02, 1B-AP-10, 1B-CS-01

**NGSS Science Standards:** K-ESS2-2, K-LS1-1, 1-LS1-1, 2-LS2-1