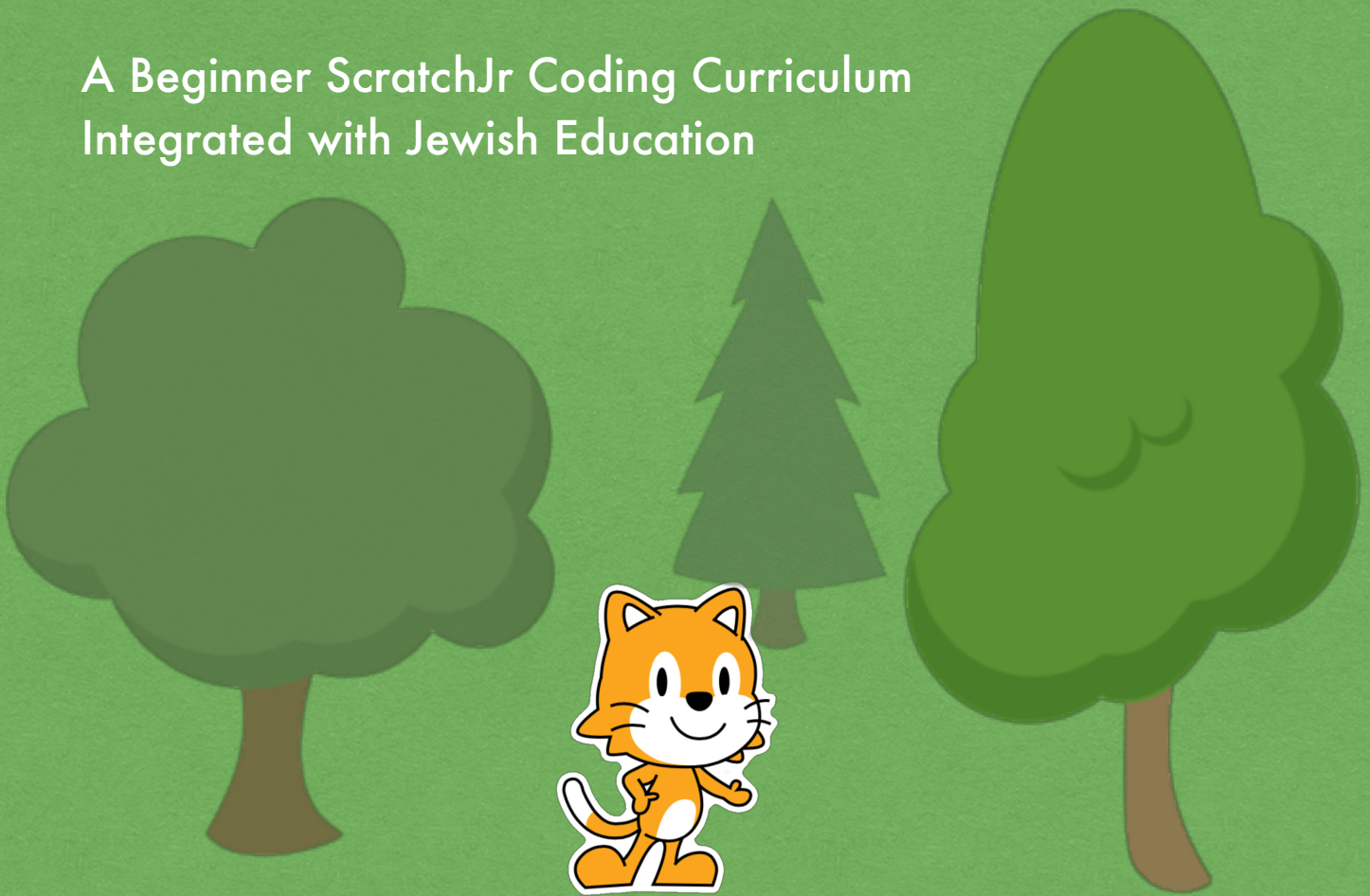# Limudei Code-Esh: Tu B'shevat

A Beginner ScratchJr Coding Curriculum
Integrated with Jewish Education
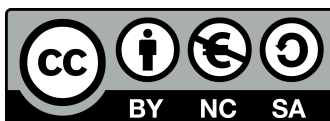
Using the Coding as Literacy (CAL) approach developed by

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This curriculum was developed by Jen Gray, Sophie Saunders, and Ryan Weinstein under supervision of Professor Marina Umaschi Bers using both novel materials and old materials developed over many years of work with the ScratchJr programming environment, developed in part by Dr. Bers' DevTech Research Group. Jewish content was provided by Michal Bessler, Dan Savitt, and Fallon Rubin, and overseen by Reena Slovin and Rabbi David Saltzman.

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Introduction

CODING AS LITERACY (CAL) APPROACH

This curriculum introduces powerful ideas from computer science, specifically programming with ScratchJr, to children in Kindergarten through 3rd grade in a structured, developmentally appropriate way in the context of Jewish education. The Coding as Literacy (CAL) approach, developed by Prof. Marina Umaschi Bers and members of her DevTech Research Group at Tufts University, understands the learning of computer science as a literacy for the 21st century computer science ideas into direct conversation with powerful ideas from literacy. Both can support learners in developing new ways of thinking about themselves and the world.

Thinking involves the ability to make sense of, interpret, represent, model, predict, and invent our experiences in the world. Thus, as educators, we must give children one of the most powerful tools for thinking: language. The term language refers here to a system of communication, natural or artificial, composed of a formal limited system of signs, governed by syntactic and grammatical combinatory rules, that serves to communicate meaning by encoding and decoding information. Today, we have the opportunity to not only teach children how to think by using natural languages, such as English or Hebrew, but also by learning artificial languages—programming languages such as ScratchJr.

The achievement of literacy in a natural language involves a progression of skills beginning with the ability to understand spoken words, followed by the capacity to code and decode written words, and culminating in the deep understanding, interpretation, and production of text. The ultimate goal of literacy is not only for children to master the syntax and grammar, the orthography and morphology, but also the semantics and pragmatics, the meanings and uses of words, sentences and genres. A literate person knows that reading and writing are tools for meaning making and, ultimately, tools of power because they support new ways of thinking.

The CAL approach proposes that programming, as a literacy of the 21st century, engages new ways of thinking and new ways of communicating and expressing ideas, as well as new ways of problem solving and working with others. CAL understands the process of coding as a semiotic act, a meaning making activity that engages children in both developing computational thinking, as well as promoting personal expression, communication, and interpretation. This understanding shapes this curriculum and our strategies for teaching coding.

The curriculum is organized around powerful ideas from both computer science and Jewish studies, as well as fundamental ideas from literacy. The term powerful idea refers to a central concept or skills within a discipline that is simultaneously personally useful, inherently interconnected with other disciplines, and has roots in intuitive knowledge that a child has internalized over a long period of time. Powerful Ideas from the core domains of Computer Science, Tu B'shevat, and Literacy are represented throughout this curriculum, and are described below.

Computer Science Powerful Ideas

This is designed as a beginner's curriculum for children who do not have previous experience with ScratchJr. The powerful ideas from computer science addressed in this curriculum include: algorithms, design process, representation, debugging, control structures, modularity, and hardware/software (see Table 1).

Table 1: Computer Science Powerful Ideas

Powerful Ideas	Definition	Relevant Lessons
Algorithms	A series of ordered steps taken in a sequence to solve a problem or achieve an end goal; a program	Lessons 2, 4, 5, 6, 7, 8
Modularity	Breaking down tasks or procedures into simpler, manageable units that can be combined to create a more complex process	Lessons 12, 13, 19, 20
Control Structures	These structures determine the order or sequence in which instructions are followed within an algorithm or program	Lesson 5
Representation	The idea that symbol systems can represent specific ideas or concepts	Lessons 2, 3, 6, 9, 10, 11, 15, 16, 17, 19, 20
Hardware/Software	Hardware is physical machinery, like a computer. Software is intangible instructions that control the hardware. Hardware and software work together as a system to accomplish tasks of sending, processing, and receiving information	Lessons 1, 19, 20
Design Process	An iterative process used to develop programs and tangible artifacts that involve the following steps: Ask, Imagine, Plan, Create, Test & Improve, Create, Share	Lessons 3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20
Debugging	A strategy for iterating and repairing issues in a program of designed artifact	Lessons 7, 8, 14, 20

Tu B'shevat Powerful Ideas

The **powerful ideas from Tu B'shevat** include: Tu B'shevat as another new year, the rituals of Tu B'shevat, the seven species, trees representing humans, trees representing the Torah, preserving the environment for future generations, recycling and composting, cycles of the year, planting and appreciating trees, Tu B'shevat as a time for personal growth, and tikkun olam (see Table 2).

Table 2: Tu B'shevat Powerful Ideas

Powerful Ideas	Definition	Relevant Lessons
Tu B'shevat as another new year, cycles of the year	Tu B'shevat is an annual Jewish holiday commemorating the yearly renewal and growth cycle of trees, an important religious symbol in Judaism	Lessons 1, 3, 4, 5, 14, 19, 20
The rituals of Tu B'shevat, the seven species	On Tu B'shevat we observe special practices, such as reciting blessings and eating sacred foods, to memorialize our heritage from Israel	Lessons 1, 6, 7, 8, 9,
Trees representing humans, trees representing the Torah, planting and appreciating trees	Trees are an important religious symbol in Judaism, representing the Torah, human relationships, and yearly cycles of renewal	Lessons 14, 15, 16, 17, 18, 19, 20
Recycling and composting, preserving the environment for future generations	Protecting and preserving the environment is a way for Jews to honor the gifts of G-d's bounty	Lessons 10, 11, 12, 13
Tu B'shevat as a time for personal growth, Tikkun Olam ("healing the world")	Tu B'shevat represents a time to reflect on the learnings and experience of the past year, as well as growth in the coming months	Lessons 14, 17, 18, 19, 20

Literacy Powerful Ideas

The **powerful ideas from literacy** that will be placed in conversation with these powerful ideas from computer science and Jewish studies are: the writing process, recalling, summarizing and sequencing, using descriptive language, and using reading strategies such as summarizing and evaluating.

ScratchJr Concepts

The most important skills and concepts from ScratchJr used in each lesson are as listed below (see Table 3). Note that this is not a complete list because each activity is meant to be creative and typically open-ended. This table is meant to indicate which skills it would be difficult to complete a lesson without. Students are always encouraged to use any blocks or skills they learn in class or on their own on any project.

Note: Lessons 19 and 20 are not included in the following table because they don't direct students to use any particular skills or blocks. The final project is intended to let children choose the story and purpose of their ScratchJr program.

ScratchJr Concept	Relevant Lessons
Sound Recording block	Lessons 1*, 6, 7, 8, 10, 11, 13, 17
Start/End blocks	Lessons 2*, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
Characters	Lessons 2*, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18
Motion blocks	Lessons 2*, 9, 11, 12, 13, 14, 15, 16, 17, 18
Paint editor	Lessons 3*, 6, 7, 8, 9, 13, 15, 17
Backgrounds	Lessons 3*, 4, 5, 9, 11, 12, 13, 14, 15, 16, 18
Grow/Shrink blocks	Lessons 4*, 7, 8
Say block	Lessons 5*, 7, 8, 13, 16, 18
Turn Page block	Lessons 5*, 14
Add Text button	Lessons 6*, 7, 8, 10
Optional: Project Sharing	Lesson 8*
Start on Tap	Lessons 7*, 8, 10, 11
Hide/Show blocks	Lessons 7*, 8, 10
Add Photo	Lesson 15*

*This lesson contains the introduction or tutorial for the associated ScratchJr concept.

Integrated Curriculum Design

The CAL approach allows students to make connections between coding and literacy, as well as between coding and Jewish studies. This curriculum encourages students to express their thoughts, ideas, and learning through ScratchJr activities related to Tu B'shevat. The curriculum is designed for a total of 20 hours, but can be adapted to particular learning settings. Each lesson contains a variety of activities, including:

● Design challenges to introduce the powerful ideas from computer science
● Discussions and activities addressing the powerful ideas from Tu B'shevat
● Reading or vocabulary activities to introduce the powerful ideas from literacy
● Work individually or in pairs on designing and creating projects
● Technology circles to share and reflect on activities

The culmination of the unit is an open-ended project to share with family and friends. Just as young children can read age-appropriate books, computer programming can be made accessible by providing young children with appropriate tools such as ScratchJr. This curriculum provides integration between Jewish education and programming in the context

of Tu B'shevat. Students will learn about why Tu B'shevat is important and relevant to the Jewish community and use the new information they learn to write creative, fun programs on ScratchJr.

PACING

This is a 20-hour curriculum unit divided into approximately 1-hour lessons. Some students may benefit from further division of the activities into smaller steps or from more time to explore each new concept before moving onto the next, either in the context of free-exploration or with teacher-designed challenges. Each of the powerful ideas from computer science in this curriculum can easily be expanded into a unit of study which will extend the curriculum and allow students to explore a range of different activities.

Table 4: Pacing Guide

Lesson	Description
Theme 1: Tu B'shevat and the Four Seasons *In this theme, children are introduced to Tu B'shevat and ScratchJr for the first time. Children create simple projects using computer science concepts of algorithms, hardware, and software, to explore basic Jewish ideas about trees, seasons, and Tu B'shevat prayers.*	
Lesson 1: What is ScratchJr? Introduction to Tu B'shevat (45 mins)	In this lesson, children learn about the holiday Tu B'shevat, and they use ScratchJr to record and play a song about this holiday.
Lesson 2: What is a Program? (50 mins)	Children learn about the motion blocks in ScratchJr through a hands-on game of Simon Says with programming instructions. Then they will build a program to show an apple falling from a tree using the motion blocks they learned.
Lesson 3: Drawing the Seasons (45 mins)	Children will create ScratchJr projects to show how trees look different depending on the seasons. They will learn how to use backgrounds to set a seasonal scene for their project, and about using the paint editor to customize their trees.
Lesson 4: What is Sequencing? Part 1, Growing Trees (45 mins)	In this lesson, children will explore how trees grow. They will use ScratchJr's grow and shrink blocks to show how trees change size over time.
Lesson 5: What is Sequencing? Part 2, Changing Seasons (55 mins)	In this lesson, children design and program stories about the changing seasons using the ScratchJr Say and Turn Page blocks.
Theme 2: Tu B'shevat Traditions *In this theme, students are introduced computer science concepts of the design process and representation as they create projects about traditional foods and blessings from the Tu B'shevat seder.*	
Lesson 6: What are ScratchJr Titles? Tu B'shevat and the Seven Species (45 mins)	In this lesson, children will explore the seven species of food eaten on Tu B'shevat. They will learn how to add text and titles to their ScratchJr projects to explain about these special foods.

Lesson 7: Programming a Recipe, Part 1 (60 mins)	In this activity, children will share their favorite recipes that feature the seven species foods. They will use ScratchJr to program the steps of their recipe.
Lesson 8: Programming a Recipe, Part 2 (60 mins)	Children will explore the design process as they iterate on their recipes. They will work together with friends to revise and improve their projects, and their work will culminate in a class Tu B'shevat cookbook.
Lesson 9: Programming an Invitation (45 mins)	Students will plan a pretend Tu B'shevat Seder, and program invitations for friends and family to this special party.

Theme 3: Tu B'shevat and the Environment
Students will gain a deeper understanding about the Tu B'shevat principles of preserving trees and giving back to the environment through their work developing ScratchJr games and stories. By designing games for someone else to play, children engage in perspective taking, as well as CS concepts of design process, modularity, and representation.

Lesson 10: Made by G-d? (50 mins)	In this activity, children will explore the natural and human-made world, and explore the ways that humans and other living beings, like trees, are similar and different. Children will then develop a ScratchJr guessing game to help their friends learn about characteristics of natural and non-natural things.
Lesson 11: Trees and Environmentalism (60 mins)	Through the story of Devarim 20:19, children explore our human responsibility to preserve trees. They will research facts about trees, forests, and environmentalism, and create persuasive interactive flyers in ScratchJr to convince friends and family to protect trees and their habitats.
Lesson 12: Recycling Game (60 mins)	This activity can help children learn that just like recycling cloth, paper, and plastic can help the environment, ScratchJr projects can be recycled and reused to make even better projects!
Lesson 13: Growing Trees and The Design Process (50 mins)	Children will explore the natural resources that trees and fruits need in order to grow. They will make a ScratchJr project to share information about how natural resources help trees grow.

Theme 4: Tu B'shevat and Jewish Symbolism
In this theme, students will explore similarities and differences between humans and trees, and discuss the meaning of trees as symbolic metaphors in Jewish texts. Using computer science concepts of the design process, modularity, and symbolic representation, students will develop code to represent and further understand these core Jewish concepts.

Lesson 14: Yearly Renewal (55 mins)	Children reflect on Tu B'shevat and how it recurs annually as a new year for trees. Then they iteratively design a ScratchJr project to show other important annual events that recur each year.
Lesson 15: Self-Portrait Tree (60 mins)	Children use the story of Gemara, Ta'anit 5b, to explore the ways that humans and trees are similar. Then, they create an interactive tree in ScratchJr to represent parts of their personality and their life.
Lesson 16: Tu B'shevat and The Giving Tree (60 mins)	In this lesson, children use the story of The Giving Tree to consider ways that trees help us. Using ScratchJr, they create new endings to the story that share ways that humans can help trees as well.

Lesson 17: Trees Rings (50 mins)	In this activity, children learn about how to tell a tree's age by looking at the rings in its trunk. Using ScratchJr characters, they will design and program tree rings to represent each year of their life, and share significant moments from each year.
Lesson 18: Tikkun Olam (55 mins)	Children reflect on the concept of tikkun olam by creating ScratchJr projects to share moments in the past when someone in their community helped them, and how they in turn hope to help someone else in future.

Theme 5: Tu B'shevat Community Project
In this theme, students will use their accumulated knowledge of foundational ScratchJr blocks and computer science concepts to represent the powerful Jewish idea that trees are often used to represent the Torah, human relationships, and personal growth. They will reflect on the roots of learning they accomplished this past year and the branches of growth they hope to achieve in following years.

Lesson 19: It is a Tree of Life, Part 1* (60 mins)	In this activity, children begin the work of creating a large tree to represent the roots of learning that they have gained from the past year, and the branches of new learning that they look forward to in the coming year. This project reflects the themes of renewal and gratitude to G-d that the Tu B'shevat holiday commemorates.
Lesson 20: It is a Tree of Life, Part 2* (60 mins)	In this activity, children finish the work of creating a large tree to represent the roots of learning that they have gained from the past year, and the branches of new learning that they look forward to in the coming year. This project reflects the themes of renewal and gratitude to G-d that the Tu B'shevat holiday commemorates.

*Note: Lessons 19 and 20 are not stand-alone and require 2 total hours of instruction.

MATERIALS

Since this curriculum is based on ScratchJr the main material necessary for the students is iPads, Androids or Chromebooks (check here https://www.scratchjr.org/about/faq for devices compatible with ScratchJr) so children are able to code. In addition, there are ScratchJr block pages that can be printed to help with student comprehension. More information is provided in lessons that use these pages. This curriculum also uses the book The Giving Tree by Shel Silverstein.

Other materials used in the curriculum are inexpensive crafts and recycled materials. The use of crafts and recycled materials, a practice already common in other domains of early childhood education, provides opportunities for children to use materials they are already comfortable with. Additionally, the use of materials that come from nature helps to supplement some of the main ideas of Tu B'shevat which are related to nature and sustainability.

PEDAGOGICAL FRAMEWORK: POSITIVE TECHNOLOGICAL DEVELOPMENT and DIALOGIC INSTRUCTION

The theoretical foundation of this curriculum, called **Positive Technological Development (PTD)**, was developed by Prof. Marina Umaschi Bers and can be found in her books: *Blocks to Robotics: Learning with Technology in the Early Childhood Classroom* (Bers, 2008), *Designing Digital Experiences for Positive Youth Development: From Playpen to Playground* (Bers, 2012), and *Coding as a Playground: Programming and Computational Thinking in the Early Childhood Classroom* (Bers, 2018). More information is included in the References section at the end of this curriculum.
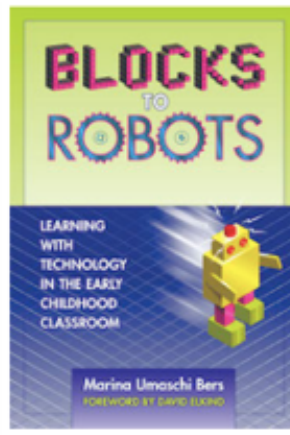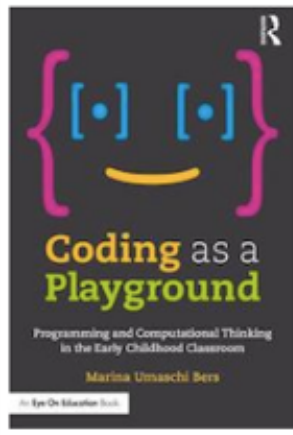
The PTD framework guides the development, implementation and evaluation of educational programs that use new technologies to promote learning as an aspect of positive youth development. The PTD framework is a natural extension of the computer literacy and the technological fluency movements that have influenced the world of education but adds psychosocial and ethical components to the cognitive ones. From a theoretical perspective, PTD is an interdisciplinary approach that integrates ideas from the fields of computer-mediated communication, computer-supported collaborative learning, and the Constructionist theory of learning developed by Seymour Papert (1993) and views them in light of research in applied development science and positive youth development.

As a theoretical framework, PTD proposes six positive behaviors (six C's) that should be supported by educational programs that use new educational technologies, such as KIBO robotics. These are: **content creation, creativity, communication, collaboration, community building, and choices of conduct**. The six C's of PTD are highlighted in the activities throughout the curriculum with their respective icons:

CONTENT CREATION by designing a ScratchJr program and programming its behaviors. The engineering design process of building and the computational thinking involved in programming foster competence in computer literacy and technological fluency.

CREATIVITY by making and programming personally meaningful projects, problem solving in creative playful ways and integrating different media such as recyclable materials, arts and crafts, and a tangible programming language. Final ScratchJr projects that represent a theme found in the overall

early childhood curriculum are a wonderful way to engage children in the creative process of learning.

COLLABORATION by engaging children in a learning environment that promotes working in teams, sharing resources and caring about each other while working with their ScratchJr programs. Collaboration is defined here as getting or giving help with a project, programming together, lending or borrowing materials, or working together on a common task. While working on their final projects, children create a collaboration web: a tool used to foster collaboration and support. Each child receives a printout with their photograph in the center of the page and the names and photographs of all the other children in the class arranged in a circle surrounding the central photo (see Appendix D for an example). Throughout the activity, with the teacher's prompting, each child draws a line from their own photo to the photos of the other children with whom they have collaborated. Children then write or draw "thank you cards" to the child with whom they have collaborated the most.

COMMUNICATION through mechanisms that promote a sense of connection between peers or with adults. For example, technology circles, when children stop their work, share their ScratchJr creation, and explain their learning process. Technology circles present a good opportunity for problem solving as a community. Some teachers invite all the children to sit together in the rug area for this. Each classroom will have its own routines and expectations around group discussions and circle times, so teachers are encouraged to adapt what already works in their class for the technology circles in this curriculum.

COMMUNITY BUILDING through scaffolded opportunities to form a learning community that promotes contribution of ideas. Final projects done by children are shared with the community via an open house, demo day, or exhibition. These open houses provide authentic opportunities for children to share and celebrate the process and tangible products of their learning with family and friends. Each child is given the opportunity not only to run their program, but to play the role of teacher as they explain to their family how they built, programmed, and worked through problems.

CHOICES OF CONDUCT which provide children with the opportunity to experiment with "what if" questions and potential consequences, and to provoke examination of values and exploration of character traits while working with ScratchJr. As a program developed following the PTD approach, the focus on learning about coding is as important as helping children develop an inner compass to guide their actions in a just and responsible way.

In alignment with the Positive Technological Development (PTD) framework, this curriculum approaches literacy from the perspective of dialogic instruction. **Dialogic instruction** is a theory of learning (and teaching) premised on the belief that students engage with literacy instruction best when there are opportunities for them to engage in authentic, open-ended interpretation of texts. If a student does not have a voice, a position, or an evaluation of the text, then what good are literary skills? Only when she needs these tools for her own purpose, to help her achieve her own interpretation, and to convince others of it, will she have a reason and motivation (beyond getting a good grade) to acquire the tools being taught. This curriculum, in adherence with the theory of dialogic instruction, strives to place the student in the position of interpreter, with opportunities for authentic, open-ended interpretation of texts. This aligns with the curriculum's approach to coding where students are given opportunities for open-ended coding tasks that encourage them to explore their own expressive ideas.

CLASSROOM MANAGEMENT

Teaching programming in an early childhood setting requires careful planning and ongoing adjustments when it comes to classroom management issues. These issues are not new to the early childhood teacher, but they may play out differently during iPad activities because of the novelty of the materials themselves. Issues and solutions other than those described here may arise from classroom to classroom; teachers should find what works in their particular circumstances. In general, provide and teach a clear structure and set of expectations for using materials and for the routines of each part of the lessons (technology circles, clean up time, etc.). Make sure the students understand the goal(s) of each activity. Posters and visual aids can facilitate children's attempts to answer their own questions and recall new information.

GROUP SIZES

The curriculum refers to whole-group versus pair or individual work. In fact, some classrooms may benefit from other groupings. Whether individual work is feasible depends on the availability of supplies, which may be limited for a number of reasons. However, an effort should be made to allow students to work in as small groups as possible, even individually. At the same time, the curriculum includes numerous opportunities to promote conversations which are enriched by multiple voices, viewpoints, and experiences. Some classes may be able to have these discussions as a whole group. Other classes may want to break up into smaller groups to allow more children the opportunity to speak and to maintain focus. Some classes structure ScratchJr time to fit into a "center time" in the schedule, in which students rotate through small stations around the room with different activities at each location. This format gives students more access to teachers when they have questions and lets teachers tailor instruction and feedback as well as assess each students' progress more easily than during whole-group work. It is important to find a structure and group size for each of the different activities (instruction, discussions, work on the challenges, and the final project) that meet the needs of the students and teachers in the class.

ALIGNMENT OF ACADEMIC FRAMEWORK

This curriculum is designed as a beginners curriculum for ScratchJr and coding and is designed to be used from Kindergarten through third grade. The curriculum is s aligned with nationally recognized computer science frameworks, including the ISTE Standards for Students (2017), K–12 Computer Science Framework (2016) and the Massachusetts Digital Literacy and Computer Science (DLCS) Curriculum Framework (2016) as well as Common Core English Language Arts (ELA)/Literacy Framework (Council of Chief State School Officers, 2011). In addition, the Jewish materials and approach was designed by a a group of experienced Jewish educators representing orthodox, conservative and reform denominational movements in Judaism. The goal is that the curriculum could be used by any Jewish learning setting across the world.

Theme 1:
Tu B'shevat and the Four Seasons

In this theme, children are introduced to Tu B'shevat and ScratchJr for the first time. Children create simple projects using computer science concepts of algorithms, hardware, and software, to explore basic Jewish ideas about trees and seasons.

Lesson 1: What is ScratchJr? Introduction to Tu B'shevat

OVERVIEW

In this lesson, children learn about the holiday Tu B'shevat, and they use ScratchJr to record and play a song about this holiday.

PURPOSE

The activities in this lesson the introduce the students to the meaning behind and the concepts associated with the holiday of Tu B'shevat. The students will also learn how to use the sound recording button in ScratchJr.

ACTIVITIES

- Tu B'shevat Discussion (15 min)
- Tu B'shevat Song (10 min)
- Welcome to ScraatchJr: Recording a Song (20 min)

STUDENTS WILL BE ABLE TO...

- Understand that on the 15th of Shevat the trees in Israel begin to blossom. In Israel, it is the new year of trees.
- Identify that Tu means 15 in Hebrew.
- Understand that flowers precede the fruit and that the almond tree is the first to blossom.

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Software/Hardware

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Tu B'shevat is another new years

SCRATCHJR CONCEPTS

☐ Introduction to the ScratchJr interface
☐ Sound recording block

Lesson 1: Activities

TU B'SHEVAT DISCUSSION (15 MIN)

Mishna, Rosh haShana 1:1 On the 1st of the Hebrew month of Sh'vat is the new year for the trees-according to Beit Shammai. Beit Hillel says: on the 15th of the month.	ראש השנה א:א בְּאֶחָד בִּשְׁבָט, רֹאשׁ הַשָּׁנָה לָאִילָן—כְּדִבְרֵי בֵית שַׁמַּאי. בֵּית הַלֵּל אוֹמְרִים: בַּחֲמִשָּׁה עָשָׂר בּוֹ.

Discuss with students what Tu B'shevat is and how we celebrate it. Introduce the idea of the new year for the trees.

What does the name of the holiday tell us? (It occurs on the 15th of the month of Shevat.) *Why does Judaism have so many holidays related to the earth/ground? Why are trees important, what do they give us?* (fruit, oxygen, shade, paper) *What do humans do that hurt trees?* (cutting them down, pollution) *What can we do to help and appreciate them?* Point out that these are the activities we do on Tu B'shevat.

These include, most importantly:

1. We plant trees in Israel or send money to have a tree planted in our name or family's name. Note that it is winter here so seeds won't grow, but in Israel it is spring.
2. We have a Tu B'shevat seder with our community, eating fruits and make blessings on the seven species from the land of Israel.
3. We learn the appropriate blessings for fruits and other foods.
4. We are mindful about recycling and taking care of our environment.

TU B'SHEVAT SONG (10 MIN)

|	
The almond blossom is flowering The golden sun is rising Birds over every rooftop Bring news of the coming of the holiday: "Tu B'shevat has arrived, a holiday for the trees!"הַשְׁקֵדְיָה	הַשְׁקֵדְיָה פּוֹרַחַת, וְשֶׁמֶשׁ פָּז זוֹרַחַת. צִפֳּרִים מֵרֹאשׁ כָּל־גַּג מְבַשְּׂרוֹת אֶת־בֹּא הֶחָג: ט"וּ בִּשְׁבָט הִגִּיעַ — חַג לָאִילָנוֹת!

WELCOME TO SCRATCHJR: RECORDING A SONG (20 MIN)

Explain that today we are going to practice creating a program in ScratchJr. First we'll learn about ScratchJr, then we'll build a program that plays a Tu B'shevat song. We'll record the song together, and then make a program to play it back to us. To begin, project one iPad onto a screen so that all students can watch the following introduction to the ScratchJr interface.

1. Open the ScratchJr app.
2. Click the plus sign to open a new project under "My Projects"

3. Show students the stage (where the action happens) and the programming area (where the character's actions are stored in order).
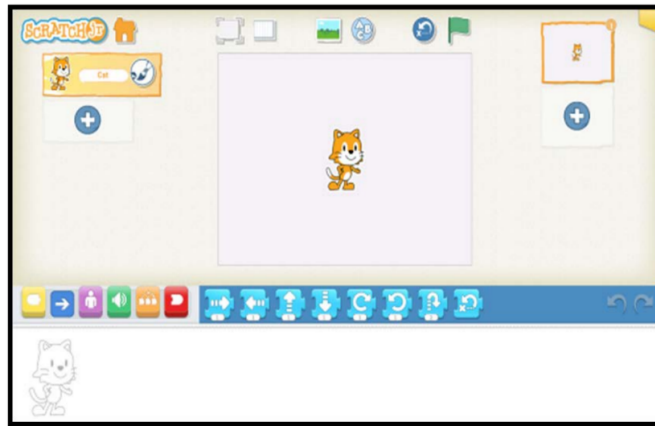
4. In the programming area, click on the green sound symbol. Within that menu, click on the microphone block with the dotted edge to record sound.
5. Have students sing the song after pressing the red record button. When done, push the same button to stop recording. Then, click the check mark.
6. Drag the new block that appeared (the microphone with a number next to it) into the programming area. Tap on it and let students listen to themselves.

Lesson 2: What is a Program?

OVERVIEW

In this lesson, children learn about the motion blocks in ScratchJr through a hands-on game of Simon Says with programming instructions. Then they will build a program to show a flower moving on a tree using the motion blocks they learned. This is to illustrate what happens on Tu B'shevat.

PURPOSE

The activities in this lesson the introduce the students to the meaning behind and the concepts associated with the holiday of Tu B'shevat. The students will also learn how to use the begin/end blocks and motion blocks in ScratchJr.

ACTIVITIES

- ScratchJr Says (10 min)
- ScratchJr Activity: Program Introduction (10 min)
- Flowers Dance on Tree (20 min)
- Technology Circle: Share Out (10 min)

STUDENTS WILL BE ABLE TO...

- Understand that on the 15th of Shevat the trees in Israel begin to blossom. In Israel, it is the new year of trees.
- Identify that Tu means 15 in Hebrew.
- Understand that flowers precede the fruit and that the almond tree is the first to blossom.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Algorithms
- ☐ Representation

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Planting and appreciating trees
- ☐ Cycles of the year

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Characters
- ☐ Motion blocks

Lesson 2: Activities

SCRATCHJR SAYS (10 MIN)

This activity is played like the traditional "Simon Says" game, in which students repeat an action if Simon says to do something. Briefly introduce the basic ScratchJr movement blocks (all of the blue blocks), such as left, right, up, down, rotate left/right, and jump. These blocks can be downloaded and printed from: https://www.scratchjr.org/pdfs/blocks.pdf. Have the class stand up for this game. Hold up one block at a time and say "Programmer says to ___". Go through each individual instruction a few times until the class seems to get it. Once the class is familiar with each instruction, the Programmer can start giving the class full programs to run through.

Teacher Tip: Connect to language symbol systems by playing this Simon Says game with letters and words. Get children to make as many words as possible with a small selection large print-out Hebrew or English letters and think about how changing the sequence changes the word that you can spell. Discuss what the letters mean alone vs in a word and how we know what sounds to make when we read them.

SCRATCHJR PROGRAM INTRODUCTION (10 MIN)

Demonstrate simple blocks for the class. They can watch or follow along on their own iPads.

1. Making a program:
   1. Drag blocks into the programming area and tap on them to show how the cat moves. Some important motion blocks are left, right, up, down, rotate left/right, and jump.
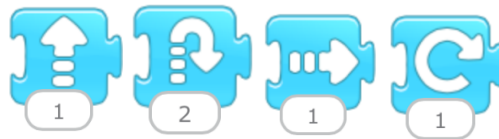
   2. Demonstrate how to change the number on a block to move multiple times.

   3. Show how to snap blocks together to make a sequence of movements.

   4. Demonstrate how to create a program using start and end blocks that runs by clicking the green flag. Note that start and end blocks are necessary when using presentation mode or when running a program with multiple parts (so they start simultaneously).

2. Adding a new character:
   1. Tap on plus sign to the left side of the screen.

      New Character

2. Select the desired character and tap the check mark to continue.

OK

3. Drag it around the stage area to place it in the desired location.

FLOWERS DANCE ON TREE (20 MIN)

Students will program a flower moving on the tree. They should choose a flower character and a tree character. They can use spin left and spin right blocks to give the effect that the flower is spinning and blowing in the wind. Then, using the programming skills discussed above, they will program their flower to appear on the tree when the start button is pressed.

Here is a sample program. Students can create their own programs for their flower to move in many different ways on the tree.

Encourage children to explore the number pad by tapping the number underneath each block. How does changing this number change the flowers actions?

TECHNOLOGY CIRCLE: SHARE OUT (10 MIN)

Play a selection of children's projects on the projector (or all if time allows). Point out that everyone had the same prompt but our programs look different. Discuss that programs can be creative and unique just like written stories, and programming is like writing a story.

Lesson 3: Drawing the Seasons

OVERVIEW

Children will create ScratchJr projects to show how trees look different depending on the seasons. They will learn how to use backgrounds to set a seasonal scene for their project, and about using the paint editor to customize their trees.

ACTIVITIES

- Seasons and Cycles Discussion (15 min)
- ScratchJr Backgrounds: Trees Representing the Seasons (20 min)

STUDENTS WILL BE ABLE TO...

- Students will know that Tu B'shevat occurs in the winter in Israel.
- Students will know that Tu B'shevat also occurs in the winter outside of Israel.
- Students will know that winter in Israel looks different than the winter in America (at least in the north).

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Representation

☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Cycles of the year

SCRATCHJR CONCEPTS

☐ Paint editor

☐ Characters

☐ Background

Lesson 3: Activities

SEASONS AND CYCLES DISCUSSION (15 MIN)

Discussion suggestion: Brainstorm the seasons that occur each year (spring, summer, fall, winter). Then focus on the trees in different seasons. Ask students "How do trees change throughout the year? What do they look like during different seasons?" Write down student's ideas.

SCRATCHJR BACKGROUNDS: TREES REPRESENTING THE SEASONS (20 MIN)

Pair students up. Have them choose a season, and then select a background that is appropriate for that season. To add a background, tap on the background icon. Select the desired background, then tap the check mark to continue.

Using the paint editor as described below, have students create a tree. They can choose how it looks, what color it is, and what shape it is.

Students should then identify / label the correct season for Tu B'shevat and write Tu B'shevat on the correct season.

1. Select a new character by tapping the plus sign on the canvas.

2. Find a tree character and select it. Then tap the paintbrush to edit. Or, tap the paintbrush in the character library to create your own tree from scratch.
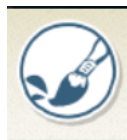
3. Choose lines, colors, and tools to edit your tree shape.

TRY IT OUT

Tap the **New Character** icon or **New Background** icon to open the character or background library. Then tap the **Paintbrush** icon to open a blank Paint Editor page.

- The **Shape** tools allow you to choose a shape to draw.
  1. Draw lines with 🖌.
  2. Draw circles and ellipses with ⭕.
  3. Draw squares and rectangles with ⬜.
  4. Draw triangles with 🔺.

- Control how thick or thin your line is with the **Line** tools.
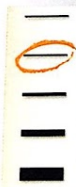
Tip: change the color of your lines using the Color Palette!

TRY IT OUT

- Use **Drag** to drag a character or shape on the canvas. To edit the shape, tap it and drag the dots that appear.

- Use **Rotate** to rotate a character or shape around its center.

- Use **Duplicate** to create a copy of a character or shape. This works just like a stamp!

- Use **Cut** and then tap a character or shape to remove it from the canvas.

Then, have the students share their creation with another group, who will guess their season. Then they can switch roles and play again, or iterate on their project by altering their trees and backgrounds.

TECHNOLOGY CIRCLE (10 MIN)

Discuss with the class what they enjoyed and what they had trouble with. Was the paint editor difficult to use? Discuss various problems students faced and how they fixed them. Do any students have tips to help their classmates solve problems they faced?

Lesson 4: What is Sequencing? Part 1

OVERVIEW

In this lesson, children will explore how trees grow. They will use ScratchJr's grow and shrink blocks to show how trees change size over time.

ACTIVITIES

- Sequencing in Nature (15 min)
- ScratchJr Activity: Growing Trees (20 min)
- Technology Circle (20 min)

STUDENTS WILL BE ABLE TO...

- Students will know that G-d created trees on the third day of creation.
- Students will know that we have a custom / tradition to plant trees on Tu B'shevat.

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Algorithms

☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Planting and appreciating trees

SCRATCHJR CONCEPTS

☐ Grow/Shrink blocks
☐ Start/End blocks
☐ Characters
☐ Backgrounds

Lesson 4: Activities

SEQUENCING IN NATURE (15 MIN)

Have students brainstorm the steps, starting from a seed and ending with blossoming trees and fruit. Do trees get smaller or larger over time?

SCRATCHJR ACTIVITY: GROWING TREES (20 MIN)

We are going to use ScratchJr to show how a tree grows over time. Choose a ScratchJr background and select the tree character to you want to use. Then use the grow/shrink blocks to show how it looks at different times in its life. Create a project showing a tree growing larger over time.\

Teacher Tip: If children have trouble getting their tree to start small, try the shrink block.

TECHNOLOGY CIRCLE (10 MIN)

Discuss with the class what they enjoyed and what they had trouble with. Were the grow and shrink blocks difficult to use? Discuss various problems students faced and how they fixed them. Do any students have tips to help their classmates solve problems they faced?

Lesson 5: What is Sequencing? Part 2

OVERVIEW

In this lesson, children design and program stories about the changing seasons using the ScratchJr Say and Turn Page blocks.

ACTIVITIES

- Discussion about the Cycle of the Seasons (15 min)
- Hebrew Vocabulary (5 min)
- ScratchJr Activity: Sequencing the Seasons (10 min)

STUDENTS WILL BE ABLE TO...

- Students will know that the word מַחְזוֹר means cycle.
- Students will know that Tu B'shevat occurs every year because it's part of the Jewish yearly cycle.
- Students will know that Tu B'shevat begins another yearly cycle for trees.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Algorithms
- ☐ Control Structures
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Tu B'shevat is the new year for trees
- ☐ Cycles of the year

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Characters
- ☐ Backgrounds
- ☐ Say block
- ☐ Turn Page block

Lesson 5: Activities

DISCUSSION ABOUT THE CYCLE OF THE SEASONS (15 MIN)

Suggested discussion: Remind children about the seasons. Focus on the order or sequence of the seasons (spring, summer, fall, winter), and discuss how the order matters. Highlight that at the end of each year, the seasons start again in the same order or sequence. Ask children how we know that seasons are changing, and review how trees change from season to season.

HEBREW VOCABULARY (5 MIN)

Suggested discussion: Teach the class the word "cycle" in Hebrew: מַחֲזוֹר.
Explain the relevance of the word "cycle" as it relates to Tu B'shevat and trees. Note that our year is a cycle, which is why we celebrate Tu B'shevat every year.

SCRATCHJR ACTIVITY: SEQUENCING THE SEASONS (10 MIN)

In the next activity, students will tell a multi-page story about changing seasons. Create multiple pages with different seasons on them, using backgrounds and tree characters. Follow the directions shown below to add a second page. Encourage children to start with 2 pages only. For example, they can show a fall scene on page 1 and a winter scene on page 2.

TRY IT OUT

- Tap the **Plus** icon under the first page to add a new page to your project.

- Each time you add a new page, a new **Go to Page** block appears in your Blocks Palette, like this:

- You can add up to four pages to a single ScratchJr project.

Tip: characters, backgrounds, and programs do not save from page to page! Make sure you add new content for each page you add.

MAKING A SEASONS STORY (15 MIN)

Once both of their pages are ready, they can create programs for their trees, or for other new characters.

Demonstrate how to use the talking or "say" block. Use the purple "say" block and the device keyboard to show a character talking about how trees change from season to season, such as falling leaves and changing colors.

Once they have pages with characters and programs, they can join them using the Turn Page block. (Note that the first page should link to the second page by using the "next page" stop block instead of the red stop block.) Remind them to think about the order of the seasons when they program their story. Students should then identify / label the correct season for Tu B'shevat and write Tu B'shevat on the correct season.

Children can get creative and add on to their seasons story! What would they like to share about the season they chose? Is it their favorite one? Which season is their birthday in? If children have extra time, they can create all four seasons and show the yearly seasons cycle.

TECHNOLOGY CIRCLE (10 MIN)

Discuss with the class what they enjoyed and what they had trouble with. Discuss various problems students faced and how they fixed them. Do any students have tips to help their classmates solve problems they faced? What would they add to their stories if they had more time?

Theme 2: Tu B'shevat Traditions

In this theme, students are introduced to the food eaten on Tu B'shevat and the steps to plan a Tu B'shevat seder. They will use the computer science concepts of the design process and representation to write programs that will further their understanding of these Tu B'shevat traditions.

Lesson 6: What are ScratchJr Titles?

OVERVIEW

In this lesson, children will explore the seven species of food eaten on Tu B'shevat. They will learn how to add text and titles to their ScratchJr projects to explain about these special foods.

ACTIVITIES

- The Seven Species (15 min)
- Creating the Seven Species (30 min)

STUDENTS WILL BE ABLE TO...

- Students will know the seven species of Israel in Hebrew and English

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Algorithms
- ☐ Representation

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Rituals of Tu B'shvat
- ☐ The Seven Species

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Paint editor
- ☐ Characters
- ☐ Add text button
- ☐ Sound Recording Block

Lesson 6: Activities

THE SEVEN SPECIES (15 MIN)

Suggested discussion: Print the words and pictures of fruit and play memory / match and say the names when they turn over each card.

שִׁבְעַת הַמִּינִים	seven species	transliteration
חִטָּה	wheat	ḥitta
שְׂעוֹרָה	barley	s'ora
גֶּפֶן	grapes	gefen
תְּאֵנָה	fig	t'ena
רִמּוֹן	pomegranate	rimmon
זַיִת	olive	za·yit
דְּבַשׁ (תָּמָר)	date (honey)	d'vash

Ask the students what is special about these seven species. Where do they grow? (Israel) When we eat these fruits, we should say thank you to G-d, the land of Israel, and rain and the environment that allowed them to grow. Remind students that these fruits need special climates, like the climates in Israel, to help them grow

SCRATCHJR ACTIVITY: CREATING THE SEVEN SPECIES (30 MIN)

Children can make a project to show the seven species. Students should pair up for this activity.

1. Select or create characters showing the seven species foods.

    1. Although children can draw or select characters from the character library, they may wish to take pictures of the seven species. Please see lesson ___: Self-Portrait Tree or visit http://scratchjr.org/learn/paint for instructions about using the camera feature in the ScratchJr paint editor.

2. Use the Add Text button to create a text box on the screen.

3. Using the device keyboard, students can type the name of one of their foods. When they finish, they can drag the text box around the screen, and place it near the fruit it labels.

    1. Note: Text boxes cannot be programmed like characters. They are just visual labels on the screen.

    2. ScratchJr uses the keyboard and characters from your device. In order to allow children to create labels in Hebrew, use your device settings to allow access to international characters on keyboards.

4. If students have time, they can also add a character of their choice to be a "pronunciation guide." Using the sound recording blocks, they can have this character say the English or Hebrew names of all of the foods on their screen.

Lesson 7: Programming a Recipe, Part 1

OVERVIEW

In this activity, children will share their favorite recipes that feature the seven species foods. They will use ScratchJr to program the steps of their recipe.

ACTIVITIES

- Seven Species Discussion (5 min)
- Planning Recipes (20 min)
- Programming a Recipe (25 min)
- Technology Circle (10 min)

STUDENTS WILL BE ABLE TO...

- Students will know the seven species of Israel in Hebrew and English

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Algorithms
- ☐ Debugging
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Eating the Seven Species and other fruits on Tu B'shvat
- ☐ The Seven Species

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Paint Editor
- ☐ Add Text, Say, or Sound Recording block
- ☐ Characters
- ☐ Start on Tap Block
- ☐ Hide/Show Block
- ☐ Grow/Shrink Block

Lesson 7: Activities

SEVEN SPECIES DISCUSSION (5 MIN)

Suggested discussion: Remind children of the seven species of food eaten in Israel during biblical times:

שִׁבְעַת הַמִּינִים	seven species
חִטָּה	wheat
שְׂעוֹרָה	barley
גֶּפֶן	grapes
תְּאֵנָה	fig
רִמּוֹן	pomegranate
זַיִת	olive
דְּבַשׁ (תָּמָר)	date (honey)

Ask students how they like to eat these foods. Have they ever picked fruit from a tree? Which is their favorite of the seven species? Brainstorm common foods that use at least one of these seven foods as ingredients.

PLANNING RECIPES (20 MIN)

Explain that we are going to make ScratchJr recipes using our favorite seven species foods. Provide the students with a seven species salad recipe. Students will decide how much of each ingredient of the seven species should be added. Remind children that just like a program, a recipe is a clear list of instructions. Simple recipes with few steps and ingredients will work best for this activity. Children can also make up their own recipes, or bring a favorite from home to share. Having a paper version of their recipe or their plan for a ScratchJr project to start with will help them program their recipe on ScratchJr.
Note: This is a 2-part lesson, so remind children that they will have plenty of time to plan and program their recipe.

Example project:
Page 1: Show all ingredients
Page 2: Show mixing the ingredients together or how to cook it
Page 3: Show the finished food!

Children may wish to program an interactive recipe, with ingredients that disappear when tapped to show they have been added. Two new blocks in ScratchJr can help with that:

Introduce Start on Tap block: Demonstrate that using this block at the beginning of a program makes a character act out its program only after you've tapped the character on the screen. Show this in presentation mode to clearly demonstrate the difference between Start on Tap and Start on Green Flag.

Introduce Hide/Show blocks: Demonstrate that adding a Hide block to a character's code will make them disappear! You can make them reappear using a Show block.

SCRATCHJR ACTIVITY: PROGRAMMING A RECIPE (25 MIN)

Once children have selected their recipe, have them work one-to-one on an iPad to build a program explaining the steps. Children can use the Add Text button, the Say block, or the Sound Recording block to add verbal or written instructions to their recipe.

TECHNOLOGY CIRCLE (10 MIN)

Invite children to share building moments that made them frustrated, excited, or confused. What can we learn from each other about building these recipes? Many children will likely face the same challenges, so have children suggest many solutions to a single problem. End by reminding children that they will be able to continue working on their recipes the next time you work with ScratchJr.

Optional Teacher Tip: At the end of this activity, you'll need to make sure that children will be able to continue using their same project or device next time. Look ahead to Lesson 8 to learn how to share all projects to one main device via email or AirDrop.

Lesson 8: Programming a Recipe, Part 2

OVERVIEW

Children will explore the design process as they iterate on their recipes. They will work together with friends to revise and improve their projects, and their work will culminate in a class Tu B'shevat cookbook.

ACTIVITIES

- Peer Debugging (15 min)
- Programming a Recipe (25 min)
- Creating a Class Cookbook (20 min)

STUDENTS WILL BE ABLE TO...

- Students will know the seven species of Israel in Hebrew and English

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Algorithms
- ☐ Debugging
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Eating the Seven Species and other fruits on Tu B'shevat

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Paint Editor
- ☐ Add Text, Say, or Sound Recording block
- ☐ Characters
- ☐ Start on Tap Block
- ☐ Hide/Show Block
- ☐ Grow/Shrink Block
- ☐ Naming and Sharing Projects

Lesson 8: Activities

PEER DEBUGGING (15 MIN)

Remind children of the recipes that they started to work on during the previous lesson. Ensure that all children have access to their same projects before beginning.

Suggested discussion: In partners, have students share their project and ask for feedback. They should practice giving helpful feedback without hurting feelings. Invite children to share with each other what they enjoyed and what they think could be improved.

- Give examples of helpful feedback, such as: "I like how you showed the apple. You could improve your recipe by saying how many apples to use."

- Discuss various problems students faced and how they fixed them.

- Discuss what makes a clear recipe. Could your steps be more specific?

- Do any students have tips to help their classmates solve problems they faced?

- What would they work on if they had more time?

SCRATCHJR ACTIVITY: PROGRAMMING A RECIPE (25 MIN)

Give children time to make any changes they want to their project. They can keep working on their original idea, or incorporate suggestions from their friends. Encourage children to work together by connecting students with programming challenges to other students who have worked through that same issue before. This is a great chance to model how debugging and revising can contribute to better final work!

SCRATCHJR ACTIVITY: CREATING A CLASS COOKBOOK (20 MIN)

At the end of this activity, you can share all projects to one main device and have a Class Cookbook for Tu B'shevat recipes. Some teachers may wish to do this after class, but you can also invite the children to help you with this.

See below the instructions for sharing projects across multiple devices. And check out https://www.scratchjr.org/learn/tips/share-projects for more information on sharing.

1. Make sure both the Sending and Receiving devices are:
    1. Turned on
    2. Connected to the internet
    3. Enabled to receive emails/AirDrops
    4. Pre-loaded with the ScratchJr app

2. On the Sending device, open the project you want to share. Tap the yellow rectangle in the top right corner of the screen to see the Project Information Screen
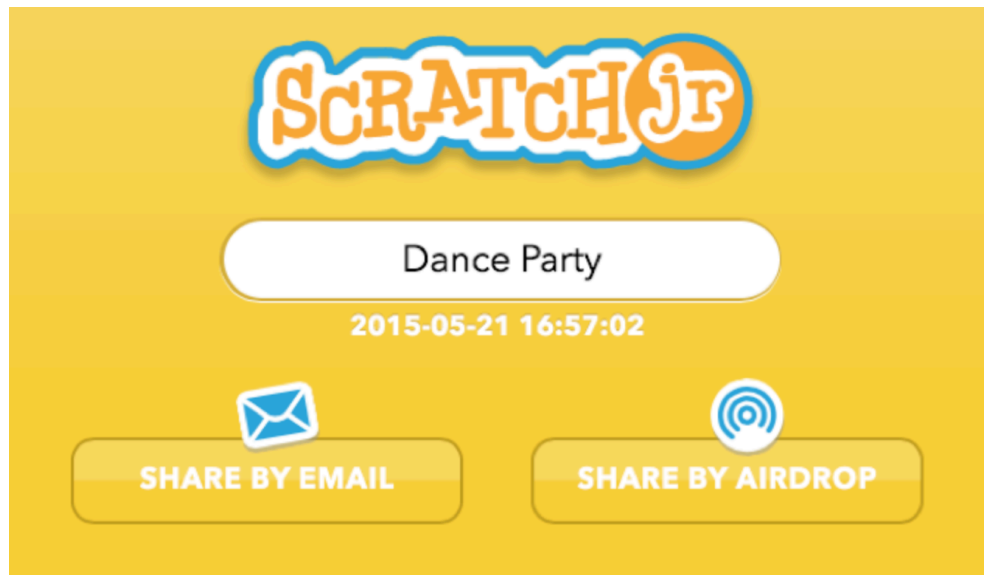
3. Type a specific name for this project (e.g. "Amy's Challah Recipe"). If children are still developing their typing skills, you can invite them to type something simple like their own name, and you can rename the project when you receive it. Share the project to your receiving device using your preferred share method (AirDrop or email)

4. On the Receiving device, open ScratchJr. You should see your newly shared project in your project library, with a blue ribbon to show it hasn't been opened yet.

See more instructions for Renaming projects: http://scratchjr.org/learn/tips/manage-projects

If sharing projects is not available on your devices, some alternative ideas include:
- Collect all paper recipe plans and create a physical class cookbook
- Record a video of each child's iPad and create a video library cookbook
- Project children's recipes onto the wall to have a class cooking show

At the end of this lesson, it might be nice to have a special snack prepared for children, to reward their hard work creating a ScratchJr recipe!

Lesson 9: Programming an Invitation

OVERVIEW

Students will plan a pretend Tu B'shevat Seder, and program invitations for friends and family to attend this special meal.

ACTIVITIES

- Seder Discussion (20 min)
- Seder Invitation (25 min)

STUDENTS WILL BE ABLE TO...

- The students will know that Israel is blessed with the seven species

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Representation
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Appreciating the food eaten on Tu B'shevat

SCRATCHJR CONCEPTS

- ☐ Motion blocks
- ☐ Paint editor
- ☐ Backgrounds
- ☐ Characters
- ☐ Add Text button
- ☐ Start/End blocks

SEDER DISCUSSION (20 MIN)

Remind students of the various Tu B'shevat customs, especially the seder that we might have with our families or communities and the foods we eat there. Read the following passage that explains where these foods are found.

DEUTERONOMY 8:7-8 (*PARASHAT EIKEV*)

כִּי הַ' אֱ•לֹהֶיךָ מְבִיאֲךָ אֶל־אֶרֶץ טוֹבָה אֶרֶץ נַחֲלֵי מָיִם עֲיָנֹת וּתְהֹמֹת יֹצְאִים בַּבִּקְעָה וּבָהָר: אֶרֶץ חִטָּה וּשְׂעֹרָה וְגֶפֶן וּתְאֵנָה וְרִמּוֹן אֶרֶץ־זַיִת שֶׁמֶן וּדְבָשׁ:

"For the LORD your G-d is bringing you into a good land, a land with streams and springs and fountains issuing from plain and hill; a land of wheat and barley, of vines, figs, and pomegranates, a land of olive trees and honey;"

Suggested discussion: After reading, ask students to identify and circle all of the new vocabulary words they can find in the passage (specifically searching for the seven species!). Then check reading comprehension with a few questions. What is the "good land"? (Israel) What was so special about it? (fertile earth, plenty of water, fresh fruit and other foods are found there)

SCRATCHJR ACTIVITY: SEDER INVITATION (25 MIN)

We are going to make invitations to our own imaginary seders!

1. Have students create a postcard of some of the foods they tried or would like to try on Tu B'shevat.

2. Think about what information invitations contain. Remember to include the time of your seder, and any other information your guests should know. Do they need to bring food? Should they wear special clothes? Be creative!

3. Have the students write the location for the Seder is in Israel (with a map) since Israel is blessed with these 7 items .

4. Add an appropriate background. How do cards in the mail often look? (Students might choose a plain-colored background here or a scene in nature.)

5. Add some movement to make the invitation a little more exciting! What happens at a seder? (Students might show people coming together/walking towards each other, or a character eating a fruit.)

6. Students should share their invitation with a friend or classmate. They can keep working on their invitation if their friend has suggestions for them.

Theme 3:
Tu B'shevat and the Environment

In this theme, students will learn about preserving trees and giving back to the environment. Students will use the ScratchJr blocks they previously learned and the computer science concepts of the design process, modularity, and representation to create programs that give them a deeper understanding of these powerful ideas. Students will know that G-d gave humans the earth to take care of, cultivate, and build upon. Students will know that some things on earth are made by humans and some things are made by G-d.

Lesson 10: Made by G-d?

OVERVIEW

In this activity, children will explore the natural and human-made world, and explore the ways that humans and other living beings, like trees, are similar and different. Children will then develop a ScratchJr guessing game to help their friends learn about characteristics of natural and non-natural things.

ACTIVITIES

- Nature Walk (15 min)
- G-d made vs Human-made Discussion (10 min)
- Partner Guessing Game (25 min)

STUDENTS WILL BE ABLE TO...

The students will know that G-d created the natural resources and humans have the ability to make things out them.

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Representation

☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Appreciating the world that G-d made

SCRATCHJR CONCEPTS

☐ Start/End Blocks

☐ Characters

☐ Start on Tap Block

☐ Hide/Show Blocks

☐ Add Text Button or Sound Recording Block

Lesson 10: Activities

NATURE WALK (15 MIN)

Take students for a short walk near school. Of the various things around us, what is created by G-d? What is human-made? How do we know when something is natural or human-made? Alive or not alive? How are they different? Some particular surroundings you may want to discuss include: cars, houses, trees, dirt, sidewalks, animals, the sky.

G-D MADE VS HUMAN-MADE DISCUSSION (10 MIN)

Suggested discussion: Begin with the following reading from Genesis about when G-d created the world.

Genesis 1:29-31 (*Parashat B'reishit*)
"G-d said, 'See, I give you every seed-bearing plant that is upon all the earth, and every tree that has seed-bearing fruit; they shall be yours for food. And to all the animals on land, to all the birds of the sky, and to everything that creeps on earth, in which there is the breath of life, [I give] all the green plants for food.' And it was so. And G-d saw all that He had made, and found it very good."

Suggested discussion: Ask students what they think the passage describes. Note that this text describes how G-d gave humans the earth to take care of, cultivate, and build upon. Some things on earth are made by humans, some things are made by G-d. The following game lets us investigate some examples.

PARTNER GUESSING GAME (25 MIN)

Now we are going to make a game to help others learn about what is G-d made and what is man-made.

1. Work in pairs or small groups. Have children start by creating a multiple-choice question for their game. Sample questions might be: Which of these things grows in nature? Which of these things needs food and water to live? Which of these things can walk and make sounds? Which of these things gives us wood for houses? Which of these things gives us paper for books?

2. Each group can choose 2-3 pre-existing characters from ScratchJr and place it on the blank screen. They should delete the starting character (Kitten) so only their selected character is shown.

3. Have children decide how a player can win the game. Do they need to tap all correct answers? Do they need only tap one? What happens when someone wins? Program their characters to react when tapped. Wrong answers might say (in text or aloud) "try again!" and hide, and right answers might jump and say "You got it!"

4. Encourage children to think about what happens after a player wins the game. For example, they might program the game to turn to a new page that gives information about natural and human-made parts of the world.

As part of their design process, invite children to play each other's games and share ideas. They should feel free to choose funny and silly answers to try and trick their friends! You can end the activity by having a videogame party with all the children's programmed games.

Lesson 11: Trees and Environmentalism

OVERVIEW

Through the story of Devarim 20:19, children explore our human responsibility to preserve the trees. They will research facts about trees, forests, and environmentalism, and create persuasive interactive flyers in ScratchJr to convince friends and family to protect trees and their habitats.

ACTIVITIES

- Devarim Discussion (15 min)
- Research Trees (15 min)
- ScratchJr Persuasive Flyer (20 min)
- Spread the Word (10 min)

STUDENTS WILL BE ABLE TO...

Students will learn that we have a responsibility to preserve trees.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Representation
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Appreciation for trees
- ☐ Preserving the environment for future generations
- ☐ Giving back to the environment

SCRATCHJR CONCEPTS

- ☐ Motion blocks
- ☐ Start/End blocks
- ☐ Characters
- ☐ Start on Tap Block
- ☐ Say or Sound Recording Block
- ☐ Backgrounds

Lesson 11: Activities

DEVARIM DISCUSSION (15 MIN)

Suggested discussion: We are going to talk about how humans are different from trees, and why we should protect trees. Begin with the following reading.

Deuteronomy 20:19 (*Parashat Shoftim*)

כִּי־תָצוּר אֶל־עִיר֩ יָמִ֨ים רַבִּ֜ים לְהִלָּחֵ֧ם עָלֶ֣יהָ לְתָפְשָׂ֗הּ לֹא־תַשְׁחִ֤ית אֶת־עֵצָהּ֙ לִנְדֹּ֤חַ עָלָיו֙ גַּרְזֶ֔ן
כִּ֚י מִמֶּ֣נּוּ תֹאכֵ֔ל וְאֹת֖וֹ לֹ֣א תִכְרֹ֑ת כִּ֤י הָֽאָדָם֙ עֵ֣ץ הַשָּׂדֶ֔ה לָבֹ֥א מִפָּנֶ֖יךָ בַּמָּצֽוֹר׃

"When in your war against a city you have to besiege it a long time in order to capture it, you must not destroy its trees, wielding the ax against them. You may eat of them, but you must not cut them down. Are trees of the field human to withdraw before you into the besieged city?"

What does this passage say about trees, as compared to humans? Why shouldn't soldiers cut down trees when they take over a city? Children might mention that trees cannot defend themselves or surrender and that humans need the trees to survive.

RESEARCH TREES (15 MIN)

Spend some time with children learning about tree facts, tree care, and urban forestry. You can explore online resources about tree botany and environmental youth activism, such as those linked below:

- https://www.dkfindout.com/us/animals-and-nature/plants/trees/

- https://www.treemusketeers.com/trees

- https://climatechangeforfamilies.com/category/kid-activism/

SCRATCHJR PERSUASIVE FLYER: PROTECT OUR TREES (20 MIN)

We are going to make flyers in ScratchJr to convince others to protect trees and tree habitats. Using the information children gathered during their research, invite them to use images, words, and facts to convince their friends that trees are important and worth preserving. Help children make their flyers more interactive by integrating characters that give more information when tapped, or using the Sound Record block to record persuasive arguments.

Encourage children to share on their flyer at least one way that humans can help to preserve trees. Examples might include planting a tree, collecting litter, and recycling products made from trees.

SPREAD THE WORD (10 MIN)

When children's flyers are done, you can project them on your classroom wall for visitors to see and interact with. Invite other classrooms or children's family members to learn from the persuasive flyers about how to preserve trees and forests.

Lesson 12: Recycling Game

OVERVIEW

This activity can help children learn that just as recycling cloth, paper, and plastic can help the environment, ScratchJr projects can be recycled and reused to make even better projects!

ACTIVITIES

- Hebrew Vocabulary (5 min)
- Recycling Discussion (10 min)
- Clapping Game (10 min)
- Recycle the Project Game (20 min)
- Share Recycled Projects (15 min)

STUDENTS WILL BE ABLE TO...

Goal: The students will learn the words
- Recycling - מִחְזוּר

The students will learn that the words Recycling - מִחְזוּר and "cycle" מַחְזוֹר are related.

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Modularity

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Preserving the environment for future generations

☐ Giving back to the environment

SCRATCHJR CONCEPTS

☐ Start/End blocks

☐ Motion blocks

☐ Characters

☐ Backgrounds

Lesson 12: Activities

HEBREW VOCABULARY (5 MIN)
Write the following vocabulary on the board and practice saying the phrases aloud.
Recycling - מִחְזוּר

RECYCLING DISCUSSION (10 MIN)
Suggested discussion: Have a discussion about recycling using some of the guiding questions below. Also, be sure to talk about how this relates to Tu B'shevat (giving back to the environment, trying to help nature as it helps us).

- What is recycling? (converting old material or waste into something new)

- Have you ever recycled (at home or in school)?

- What kind of materials can we recycle? (plastic, paper, cardboard, glass, metal)

- Why do we talk about recycling on Tu B'shevat? (re-using materials instead of throwing them away helps the environment and prevents waste)

CLAPPING GAME (10 MIN)
We are going to play a little musical game to get us ready for our ScratchJr activity. Sit in a circle and start a simple clapping rhythm. Keep it going until everyone is comfortable with it. Add new clapping patterns to make the rhythm more complex. For example, add repetition or change the speed. Now, break the class into groups of two or three. Everyone claps at the same time, but each group should clap their own unique rhythm. This is parallelization in action. Mention that this can also be done in ScratchJr by running multiple programs with different characters.

SCRATCHJR ACTIVITY: RECYCLE THE PROJECT GAME (20 MIN)
Just like we all worked one small part of a big group song during the clapping game, we're now all going to work on our own programs in group projects with ScratchJr!

Tell students we are going to play a game about recycling, but instead of materials like paper, we are going to recycle ScratchJr projects! Explain that the projects we make in this game are going to be changed by other friends. Be prepared to say goodbye to the project we start with and hello to a totally new project.

1. Children should sit in a circle or around a table with one iPad each.

2. Open a new project and spend 3-5 minutes adding whatever they want to their project. This can be a character, a program, a background, a title - anything!

3. After a few minutes, have children switch to the seat next to them. Everyone should have a new iPad with a different project on it. Now, spend another few minutes adding something to this project.

4. Keep going until time runs out!

SHARE RECYCLED PROJECTS (15 MIN)

Have children share their iPads on the projector for everyone to see. They should explain what their project started with, and everyone can notice all the changes and re-used elements that have been added. This activity can get silly and fun! Help children enjoy the fun by reminding them that they can always start a new project if they got attached to an idea they started.

Lesson 13: Growing Trees and The Design Process

OVERVIEW

Children will explore the natural resources that trees and fruits need in order to grow. They will make a ScratchJr project to share information about how natural resources help trees grow.

ACTIVITIES

- Growing as a Design Process (10 min)
- ScratchJr Resources Project (20 min)
- Using Design Process; Iterating on Project (20 min)

STUDENTS WILL BE ABLE TO...

The students will learn the word "cycle" מַחְזוֹר. Students will know that it is a custom to plant trees in Israel.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Modularity
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ There is a custom to plant trees in Israel on Tu'Bshevat

SCRATCHJR CONCEPTS

- ☐ Sound Recording or Say block
- ☐ Start/End blocks
- ☐ Motion blocks
- ☐ Paint Editor
- ☐ Characters
- ☐ Backgrounds

Lesson 13: Activities

GROWING AS A DESIGN PROCESS (10 MIN)

Suggested discussion: Discuss growing plants and why it is a cycle. Consider how small trees grow from small seeds or acorns, how they grow larger and larger, and finally shed new seeds to grow new trees. Think about all the natural resources that trees and fruits need to grow, like air, water, light, and nutrient-rich soil. You may also show a video or tell a story about planting trees in Israel on Tu B'shevat.

Next, discuss the design process. Similarly to growing, it is an ongoing cycle: we come up with ideas, plan and build our new designs, test and improve on them, and start over again with new ideas. What resources do we need to implement the design process? (Maybe a good idea, patience, and creativity!)

Design Process
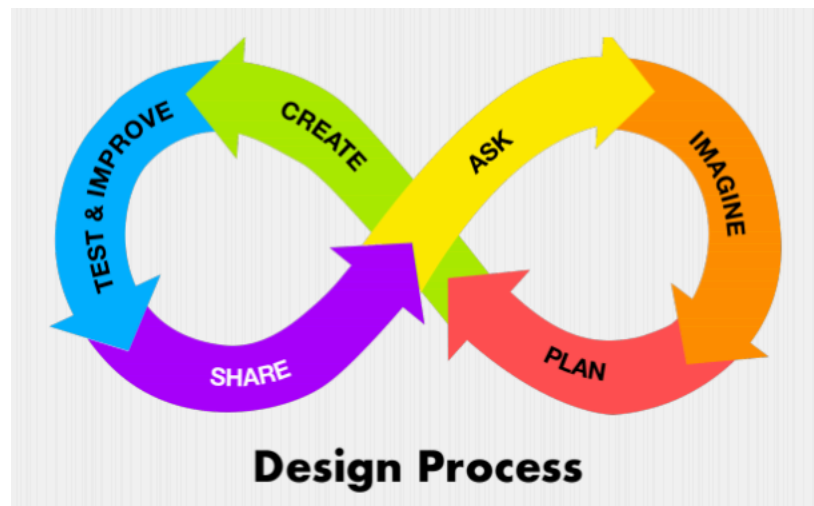
SCRATCHJR RESOURCES PROJECT (20 MIN)

Today we are going to make a collage to show how natural resources help plants and trees grow.

1. Open a new project and add an outdoor background.

2. Add characters to show natural resources that trees need to grow. Remember to include things like rain/water, sunlight, air/clouds, and soil with nutrients.

    1. Help children use characters to represent resources. For example, they can use characters such as rain clouds or droplets for water, and a sun for light.

3. Program each character to do a dance or move around on the screen and say something about how it helps trees to grow. Children can use the Sound Recording or the Say blocks for this. Encourage children to get creative and record sounds from the real world!

USING THE DESIGN PROCESS; ITERATING ON THEIR PROJECT (20 MIN)

The class should form small groups and share their code and results. Discuss what they could improve and share ideas for solving any problems that came up. Some ways to enhance a project might include: Adding more resources; adding linked pages to tell a story about how a tree grows over time; adding text instructions to tell players to tap the natural resources.

After hearing feedback from their group, students should keep working and edit their code to implement these improvements. This activity helps teach the powerful idea of the design process and requires collaboration and idea sharing, and also shows the importance of composting to help the environment.

Theme 4:
Tu B'shevat and the Jewish Symbol

In this theme, students will analyze the ways that humans are similar to trees, and they will discuss more ways that humans can show appreciation for trees. Using computer science concepts of the design process and representation, students will develop code to represent and further understand these core Jewish concepts.

Lesson 14: Yearly Renewal

OVERVIEW

Children reflect on Tu B'shevat and how it recurs annually as a new year for trees. Then they iteratively design a ScratchJr project to show other important annual events that recur each year.

ACTIVITIES

- New Year Discussion (10 min)
- Programming our Yearly Cycles (25 min)
- Yearly Cycles and Renewal Discussion (20 min)

STUDENTS WILL BE ABLE TO...

- Students will know that Tu B'shevat occurs every year.
- Students will know that Tu B'shevat is the new year for trees.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Debugging
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Yearly Renewal
- ☐ Tu B'shevat as a new year for the trees

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Motion blocks
- ☐ Characters
- ☐ Backgrounds
- ☐ Turn Page Block

Lesson 14: Activities

NEW YEAR DISCUSSION (10 MIN)

Suggested discussion: Remind students that Tu B'shevat is a Jewish new year holiday for trees. Use the Mishna as a source. What new years events are celebrated around the world, other than Tu B'shevat? Students might mention Rosh Hashanah, January 1st, the Chinese new year, etc. Notice that we celebrate these every year. What kinds of activities are common on these days (celebration, fireworks, blowing the shofar, parades)? All of these new year holidays are a time for us to be thankful for what we have. On Tu B'shevat, we give thanks to the earth and consider how we can improve ourselves and the world around us.

PROGRAMMING OUR YEARLY CYCLES (25 MIN)

We are going to make ScratchJr programs that share about our favorite yearly celebrations and activities. All students should start with Tu B'shevat and then on other pages, add different occasions. Some examples you may want to program include: birthdays, Hanukkah, the first day of school, or an annual family trip. Use the Turn Page block to connect the annual events in the order they occur each year.

Students should first add pages and backgrounds that fit their yearly activities. They then can add and program characters to show what they like to do during that annual event. For example, what do we do on Tu B'shevat?

Note: To put their pages in the correct order, students may need to be reminded when certain Jewish holidays fall in the secular calendar (for example, that Tu B'shevat occurs around the end of January or beginning of February). To continue the cycle of yearly renewal, see if children can figure out how to keep the pages of their project turning forever by linking the last page back to the first one.

YEARLY CYCLES AND RENEWAL DISCUSSION (20 MIN)

Have students share their programs or selected events in a large group. Write down a timeline on a board or large piece of paper when each activity happens (e.g. what month). Chart as many events as possible to see a year of all of our annual celebrations at once. Reflect on how those holidays change from year to year. Will we celebrate differently next year? In 2 years? In 5 years? End by thinking about the renewal of growing trees on Tu B'shevat and how we are all growing each year.

Lesson 15: Self-Portrait Trees

OVERVIEW

Children use the story of Gemara, Ta'anit 5b, to explore the ways that humans and trees are similar. Then, they create an interactive tree in ScratchJr to represent parts of their personality and their life.

ACTIVITIES

- Humans and Trees Discussion (20 min)
- Using a photo as character (10 min)
- Self-Portrait Tree (30 min)

STUDENTS WILL BE ABLE TO...

- Students will know that the Talmud relates humans to trees and we have to care for and preserve both.

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Representation

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Relating humans and trees

☐ Preserving the environment for future generations

SCRATCHJR CONCEPTS

☐ Start/End blocks

☐ Paint Editor

☐ Motion blocks

☐ Characters

☐ Backgrounds

☐ Add Photo

HUMANS AND TREES DISCUSSION (20 MIN)

Suggested discussion: Read aloud the following talmudic passage where Rabbi Yitzchak blesses Rav Nachman that his offspring should be like him:

Babylonian Talmud, *Ta'anit* 5b-6a:

כי הוו מיפטרי מהדדי א"ל ליברכן מר אמר ליה אמשול לך משל למה"ד לאדם שהיה הולך במדבר והיה רעב ועייף וצמא ומצא אילן שפירותיו מתוקין וצילו נאה ואמת המים עוברת תחתיו אכל מפירותיו ושתה ממימיו וישב בצילו וכשביקש לילך אמר אילן אילן במה אברכך אם אומר לך שיהו פירותיך מתוקין הרי פירותיך מתוקין נאה הרי צילך נאה שתהא אמת המים עוברת תחתיך הרי אמת המים עוברת תחתיך אלא יהי רצון שכל נטיעות שנוטעין ממך. יהיו כמותך אף אתה במה אברכך אם בתורה הרי תורה אם בעושר הרי עושר אם בבנים הרי בנים אלא יהי רצון שיהו צאצאי מעיך כמותך:

"The Gemara relates: When they were taking leave of one another, Rav Naḥman said to Rabbi Yitzḥak: Master, give me a blessing. Rabbi Yitzḥak said to him: I will tell you a parable. To what is this matter comparable? It is comparable to one who was walking through a desert and who was hungry, tired, and thirsty. And he found a tree whose fruits were sweet and whose shade was pleasant, and a stream of water flowed beneath it. He ate from the fruits of the tree, drank from the water in the stream, and sat in the shade of the tree.

"And when he wished to leave, he said: Tree, tree, with what shall I bless you? If I say to you that your fruits should be sweet, your fruits are already sweet; if I say that your shade should be pleasant, your shade is already pleasant; if I say that a stream of water should flow beneath you, a stream of water already flows beneath you. Rather, I will bless you as follows: May it be G-d's will that all saplings which they plant from you be like you. So it is with you. With what shall I bless you? If I bless you with Torah, you already have Torah; if I bless you with wealth, you already have wealth; if I bless you with children, you already have children. Rather, may it be G-d's will that your offspring shall be like you."

Discuss the meaning of this story. What does it mean, "May it be G-d's will that all saplings which they plant from you be like you"? How are humans and trees similar? Compare humans to trees and discuss the similarities. Think about other ways that humans are similar to trees that are not mentioned in the text.

Here are some examples:

- Trees need water - man needs water

- Trees need sun - man needs love

- Trees bear fruit - man bears children

- Trees have roots - man has family tree roots

- Trees can be re-planted - man can recreate

- Trees change with the seasons - man adapts to his environment

USING A PHOTO AS A CHARACTER (10 MIN)

1. Add a new character and open the paint editor

New Character

2. Select the camera tool and then select a shape for the camera to fill.
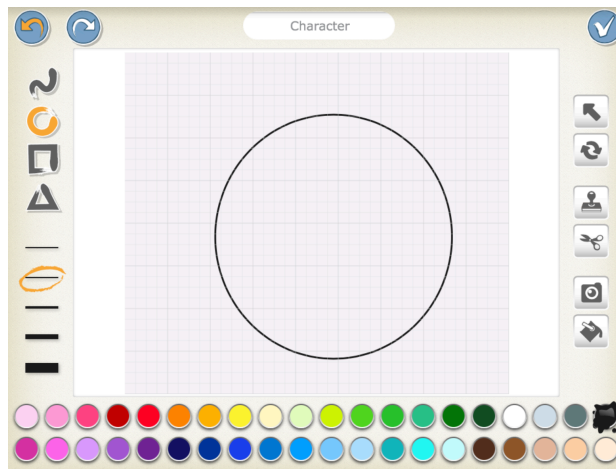
3. Select the correct photo, then tap the check mark to return to the stage.

SELF-PORTRAIT TREE (30 MIN)

Students should work alone to create a tree that represents them.

1. Have students build a project with a tree character. They can paint their own tree and add whatever details they like. When they go outside, where do they like to spend time? Add a background accordingly.

2. Children should add pictures of themselves and things that they like to their tree. They can add pictures or characters to show whatever they like throughout their tree.

    1. For example, they can show their family in the roots, favorite activities in the trunk, and ideas about what they'd like to be when they grow up in the branches.

3. Encourage children to think of the ways they are like a tree and include that in their self portrait. Do they need water to drink and food to eat? Do they like to play outside and watch the clouds? Include these ideas through recordings or pictures in their self-portrait collage.

When self portraits are done, spend some time sharing with friends near them. Maybe they can learn something new about their friend!

Lesson 16: Tu B'shevat and The Giving Tree

OVERVIEW

In this lesson, children use the story of *The Giving Tree* to consider ways that trees help us. Using ScratchJr, they create new endings to the story that share ways that humans can help trees as well.

ACTIVITIES

- Read *The Giving Tree* by Shel Silverstein (20 min)
- Gratitude and Trees Discussion (10 min)
- ScratchJr Activity: Alternative Ending (20 min)
- Technology Circle (10 min)

STUDENTS WILL BE ABLE TO...

- Students will know that that in Hebrew, the word for gratitude is הַכָּרַת הַטוֹב which literally means "recognizing the good."
- The students will know that we should act in a way that shows our appreciation.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Representation
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Relating humans and trees

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Motion blocks
- ☐ Background
- ☐ Characters
- ☐ Say Block

Lesson 16: Activities

READ THE GIVING TREE BY SHEL SILVERSTEIN (20 MIN)

Suggested discussion: Before reading, explain that we've already discussed how humans and trees are different. Now we are going to look at some similarities. The following gives some guiding questions for consideration while reading the book.

- What did the tree give the boy? (shade, apples, a house, a boat, friendship)

- What did the boy give the tree? (friendship)

- What could the boy have given the tree? (water, planting its seeds, kindness)

- What important lessons can we learn from this story? (Be grateful for what we receive from others, give back to those we care about and to the world)

GRATITUDE AND TREES DISCUSSION (10 MIN)

Now we will have a class discussion about our appreciation for trees and ways that we can show appreciation for trees. Ask students what they think "gratitude" means. Explain that in Hebrew, the word for gratitude is הַכָּרַת הַטּוֹב (Hakarat Hatov) which literally means "recognizing the good." In *The Giving Tree*, we learn the importance of being grateful for trees and all that they give us. What else and who else are we grateful for in our lives? How should we treat the people and things that we appreciate?

SCRATCHJR ACTIVITY: ALTERNATE ENDING (20 MIN)

Choose one scene from the book to represent in a ScratchJr project, but change the boy's actions. What could he have done differently to show his gratitude to the tree?

Examples include:
- The boy waters the tree

- The boy plants other trees nearby

- The boy brings his friends to sit in the shade of the tree

TECHNOLOGY CIRCLE (10 MIN)

Spend a few minutes at the end of this activity allowing children to tell their new story segments to each other. Have them explain why they changed the story the way they did and how it relates to Hakarat Hatov. Invite them to share what they would have added to their project if they had more time.

Lesson 17: Tree Rings

OVERVIEW

In this activity, children learn about how to tell a tree's age by looking at the rings in its trunk. Using ScratchJr characters, they will design and program tree rings to represent each year of their life, and share significant moments from each year.

ACTIVITIES

- Tree Rings Discussion (15 min)
- Tree Trunk Activity (25 min)
- Technology Circle (10 min)

STUDENTS WILL BE ABLE TO...

- Compare trees to humans and recognize that both have important milestones and grow every year

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Representation
- ☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Relating humans and trees
- ☐ Preserving the environment for future generations

SCRATCHJR CONCEPTS

- ☐ Start/End blocks
- ☐ Motion blocks
- ☐ Characters
- ☐ Sound Recording block
- ☐ Paint editor

Lesson 17: Activities

TREE RINGS DISCUSSION (15 MIN)

Suggested discussion: Explain a bit about what tree rings are. Trees live anywhere from 40 years to 5000 years, and each year they add a new growth ring. We can count a tree's rings to see how old the tree is. Each ring's size and shape shows how much the tree grew that year. Why might a tree grow more one year than another? (With more rain or sunlight, a tree will grow more. If there is a bad storm or a drought, a tree might grow less.) Humans don't have one physical characteristic that tells us about their growth or how they are doing. How do we know how another person's year is going?

TREE TRUNK ACTIVITY (25 MIN)

In this activity we will program a representation of ourselves as a tree trunk. Create a new character and draw the correct number of rings. (A 5-year-old would have 5 rings.) The sizes or shapes of the rings can be different -- in what years did you grow or change the most (spiritually, physically)? Students can add different colors or pictures/symbols in each ring. Once the character is completed, they can give it some movement to represent themselves.

If children have time, they can create a new character for each ring and have them shown in order. Children can program each ring with a voice recording to tell about significant moments from that year of their life. Children could also work with a partner, teacher, or family member to create a tree for their life on a second page. How many rings do they have? Does it have more or fewer rings than the tree on the first page of the project?

TECHNOLOGY CIRCLE (10 MIN)

Discuss with the class what they enjoyed and what they had trouble with. Discuss various problems students faced and how they fixed them. Do any students have tips to help their classmates solve problems they faced?

Lesson 18: Tikkun Olam

OVERVIEW

Children reflect on the concept of tikkun olam by creating ScratchJr projects to share moments in the past when someone in their community helped them, and how they in turn hope to help someone else in future.

ACTIVITIES

- Tikkun Olam Discussion (10 min)
- Planting Trees Reading (15 min)
- ScratchJr Activity: Tikkun Olam (20 min)
- Share Tikkun Olam Projects (10 min)

STUDENTS WILL BE ABLE TO...

- The students will know that an example of Tikkun Olam is doing something to help preserve the future.

POWERFUL IDEAS FROM COMPUTER SCIENCE

☐ Design Process

POWERFUL IDEAS FROM TU B'SHEVAT

☐ Giving back to the environment

☐ Tikkun Olam

☐ Preserving the environment for future generations

SCRATCHJR CONCEPTS

☐ Motion blocks
☐ Background
☐ Say Block

Lesson 18: Activities

TIKKUN OLAM DISCUSSION (10 MIN)

What is tikkun olam? What are examples of tikkun olam? Have you done anything to help repair the world? Recycling is also an example of tikkun olam.

PLANTING TREES READING (15 MIN)

Suggested discussion: Read the following talmudic passage aloud to the class, which is about a man named Ḥoni Hameagel seeing someone plant a carob tree:

Babylonian Talmud, *Ta'anit* 23a

יומא חד הוה אזל באורחא חזייה להההוא גברא דהוה נטע חרובא אמר ליה האי עד כמה שנין טעין אמר ליה עד שבעין שנין אמר ליה פשיטא לך דחיית שבעין שנין אמר ליה האי [גברא] עלמא בחרובא אשכחתיה כי היכי דשתלי לי אבהתי שתלי נמי לבראי

יתיב קא כריך ריפתא אתא ליה שינתא נים אהדרא ליה משוניתא איכסי מעינא ונים שבעין שנין כי קם חזייה להההוא גברא דהוה קא מלקט מינייהו אמר ליה את הוא דשתלתיה א"ל בר בריה אנא אמר ליה שמע מינה דניימי שבעין שנין חזא לחמריה דאתיילידא ליה רמכי רמכי

"One day, he was walking along the road when he saw a certain man planting a carob tree. Ḥoni said to him: This tree, after how many years will it bear fruit? The man said to him: It will not produce fruit until seventy years have passed. Ḥoni said to him: Is it obvious to you that you will live seventy years, that you expect to benefit from this tree? He said to him: That man himself found a world full of carob trees. Just as my ancestors planted for me, I too am planting for my descendants.

"Ḥoni sat and ate bread. Sleep overcame him and he slept. A cliff formed around him, and he disappeared from sight and slept for seventy years. When he awoke, he saw a certain man gathering carobs from that tree. Ḥoni said to him: Are you the one who planted this tree? The man said to him: I am his son's son. Ḥoni said to him: I can learn from this that I have slept for seventy years, and indeed he saw that his donkey had sired several herds during those many years."

Discuss the meaning of the story. Talk about words or parts of the passage that students did not understand. The following questions can guide a class discussion.

- Why did the man plant the tree? Do you think this is a good idea?

- How does this relate to tikkun olam?

- Did the man's work pay off?

- Consider the mitzvah of helping future generations. Have you ever done something that will benefit future generations? Can you think of other ways you can help future generations?

SCRATCHJR ACTIVITY: TIKKUN OLAM (20 MIN)

Tell students we are going to make ScratchJr projects to share stories of tikkun olam in our lives.

1. Create a new project. Open 2 pages.

2. On page 1, program a story about a family member, classmate or teacher who did something nice for you in the past. This can be giving a gift, driving to school, or anything else.

3. On page 2, program a story about something nice you would like to do in return. How can we give back and say thank you to our parents, teachers, and friends?

SHARE TIKKUN OLAM PROJECTS (10 MIN)

Let students turn and share their projects with a friend, or project on the wall for everyone to see. If time permits, you can guide children in a Tu B'shevat discussion about how past actions are like planting the roots of a tree and future ones are like the branches.

Theme 5:
Tu B'shevat
Community Project

In this theme, students will use any of the ScratchJr blocks and computer science concepts to represent the powerful Jewish idea that trees are often used to represent the Torah. They will reflect on the branches of learning they accomplished this past year and ones they hope to achieve in following years.

Lesson 19: It is a Tree of Life, Part 1

OVERVIEW

In this activity, children begin the work of creating a large tree to represent the roots of learning that they have gained from the past year, and the branches of new learning that they look forward to in the coming year. This project reflects the themes of renewal and gratitude to G-d that the Tu B'shevat holiday commemorates.

ACTIVITIES

- Tree of Life Etz Chaim Hi Song (10 min)
- Tu B'Shevat Discussion (15 min)
- Project Introduction and Brainstorming (20 min)
- Technology Circle (15 min)

STUDENTS WILL BE ABLE TO...

- The students will know that the Torah is compared to a tree in many ways.

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Modularity
- ☐ Representation
- ☐ Design Process
- ☐ Hardware/Software

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ The Torah is a tree of life

SCRATCHJR CONCEPTS

- ☐ Open-ended; all of them could be used for this project, so hopefully students will use a mix of the various blocks they have learned about.

Lesson 19: Activities

TREE OF LIFE ETZ CHAIM HI SONG (10 MIN)

Teach students the following song.

It is a tree of life for those that hold fast to it,
And all its supporters are happy (x2)

Shalom, shalom (x4)

Etz chayim hi lemachazikim ba
V'tom'cheha m'ushar (x2)

TU B'SHEVAT DISCUSSION (15 MIN)

Suggested discussion: We've seen that trees can represent many bigger, harder-to-define concepts. Similarly to how we've seen trees represent humans, trees are also used to represent the Torah. Discuss the song and the phrase "Etz Chayim Hi Lemachazikim Ba" (it is a tree of life to those that hold on to it). What does this say about the Torah? In what ways is the Torah similar to a tree? If necessary, similarities can be prompted by parts of the tree:

1. Fruit: Like the fruit of a tree sustains us, so does the teaching of the Torah. The Torah nourishes our soul like fruit nourishes our body.

2. Roots: The roots anchor the tree and allow it to grow, like the Torah steadies us and helps us grow spiritually.

3. Branches: The branches of a tree help the tree reach sunlight like the Torah helps us be closer to G-d.

Note that on Tu B'shevat, we not only wish the trees a good year (Shana Tova La'ilanot) but we also wish for ourselves and others a year of growth in Torah. This is because of the strong connection between trees and Torah.

Project Introduction and Brainstorming (20 minutes)
Now, we will introduce the final ScratchJr project: making a large two-dimensional tree of life to represent student's Tu B'shevat learning, with ScratchJr projects laid down around the tree to be the roots, leaves, and fruit.

Students can brainstorm in pairs or small groups about why Tu B'shevat is important and what they've learned about the new year. How might we show some of these ideas using ScratchJr? Allow students to plan and design their projects before beginning work. Once they have a plan, they may begin programming.

TECHNOLOGY CIRCLE (15 MIN)

Discuss with the class what they have made so far and what they had trouble with. Do any students have tips to help their classmates solve problems they faced? Make sure children all have an idea about what they want to keep working on when they continue this activity.

Optional Teacher Tip: At the end of this activity, you'll need to make sure that children will be able to continue using their same project or device next time. Refer to Lesson 8 to learn how to share all projects to one main device via email or AirDrop.

Lesson 20: It is a Tree of Life, Part 2

OVERVIEW

In this activity, children finish the work of creating a large tree to represent the roots of learning that they have gained from the past year, and the branches of new learning that they look forward to in the coming year. This project reflects the themes of renewal and gratitude to G-d that the Tu B'shevat holiday commemorates.

ACTIVITIES

- Collaboration Web (5 min)
- Final Project (30 min)
- Community Open House (25 min)

POWERFUL IDEAS FROM COMPUTER SCIENCE

- ☐ Algorithm
- ☐ Modularity
- ☐ Design Process
- ☐ Hardware/Software
- ☐ Representation

POWERFUL IDEAS FROM TU B'SHEVAT

- ☐ Preserving the environment for future generations
- ☐ New Year for the trees

SCRATCHJR CONCEPTS

- ☐ Open-ended; all of them could be used for this project, so hopefully students will use a mix of the various blocks they have learned about.

Lesson 20: Activities

COLLABORATION WEB (5 MIN)

Suggested discussion: Pass out the collaboration web to each student. Explain that any time a student talks with, gets help from, or shares ideas with a classmate, they should draw a line from their picture to their classmates picture on their collaboration web. See Appendix A for a sample collaboration web.

FINAL PROJECT (30 MIN)

Students can continue to work on their classroom tree to showcase what they learned about Tu B'shevat and wishing a year of growth to the trees, the world, and each other.

Students can choose to make any element of a tree that they want to represent their growth through the year and the learning they hope to gain the coming year. Some examples include:

- A "root" project to show something from the past year that has helped them to learn and grow

- A "leaf" project to show something they hope to explore in the new year.

- A "fruit" project to show something they are grateful for in the current moment, or some way they have benefitted from trees, community, Judaism, etc.

COMMUNITY OPEN HOUSE (25 MIN)

When all children's projects are ready, invite family, friends, and community members to come and visit their tree of life. Invite children to sing Tu B'shevat songs, share facts they've learned about trees, and recite the blessings of the Tu B'shevat seder. They can share what was easy or difficult about the project, what they would have done if they had more time, etc. Families and friends can join in the fun by interacting with the ScratchJr projects and learning what children created for their tree of life projects. You can culminate or extend this activity by planting a class tree on the school property, at a local public garden, or in a large pot in the classroom or on the playground.

Appendix A. Collaboration Web

Appendix A. Collaboration Web

A collaboration web is a tool for students to recognize peers who have helped and supported them in different ways, such as working together on a common task, lending or borrowing materials, programming together, etc. Students will create a Collaboration Web during Lesson 8: The Wild Rumpus Project and write thank you letters to the three peers with whom they have collaborated the most.

Directions:
1. Obtain headshots of each student in the class.
2. Create individual printouts with each student's photograph in the center of the page and the names and photographs of all the other students arranged in a circle surrounding the central photo.
3. Whenever you observe students collaborating during the final project, ask students to draw a line from their photo in the center to the photo of the other students with whom they collaborated.
4. At the end of Lesson 8, ask students to count the number of lines they have with each student. Ask students to write thank you letters to the three students who have the most lines drawn to their photos.

Sample Collaboration Web:
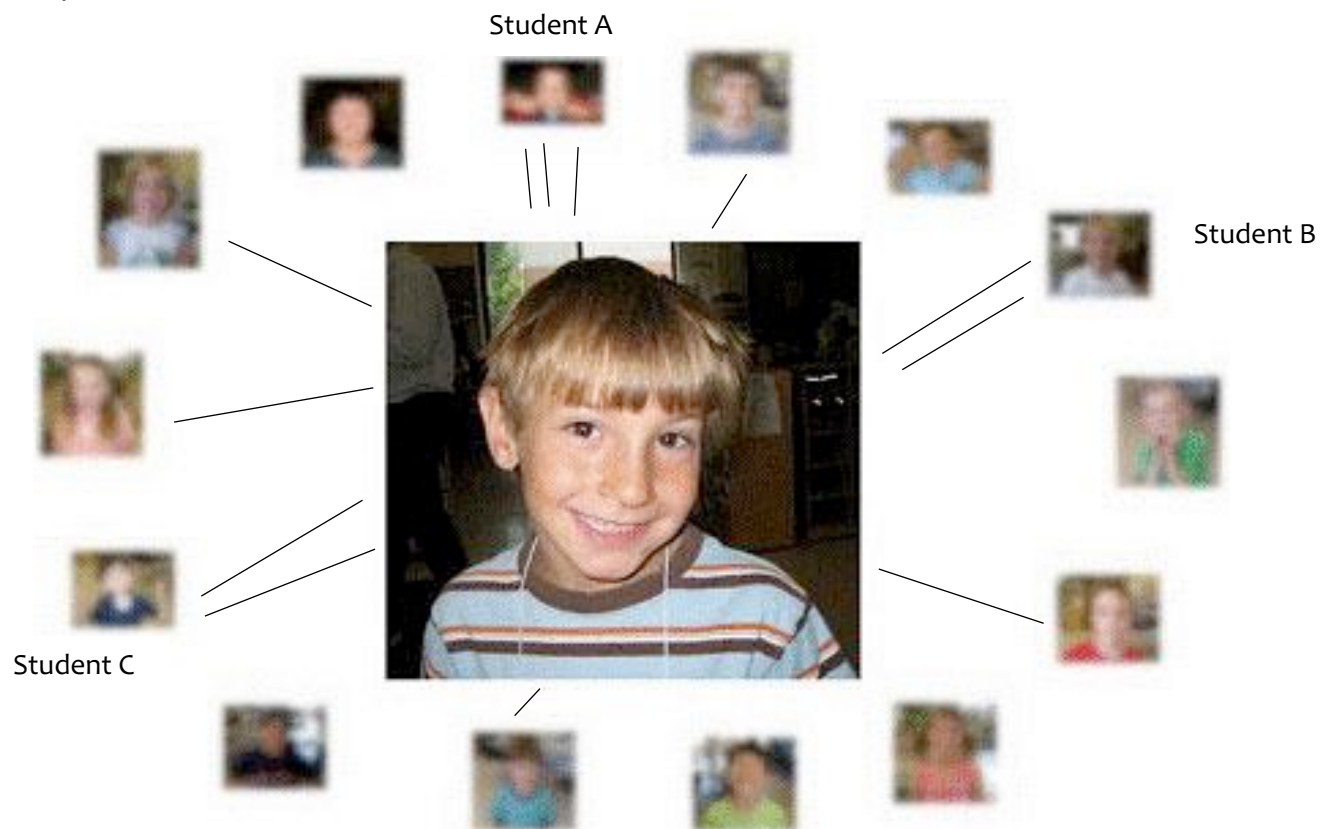
The student in the center will write thank you letters to Students A, B, and C.