LEAGUE OF DREAMS ADAPTIVE STEM SUPPLEMENT

SPECIAL EDUCATION - INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA) 504 PLANS, REHABILITATION ACT

Federal law ensures that every child, between the ages of 3–21 years old, has the right to an education. The Individuals with Disabilities Education Act (IDEA) provides that all children with disabilities are entitled to a free appropriate public education (FAPE) in the least restrictive environment (LRE) to meet their unique needs and prepare them for further education, employment, and independent living.

- Free Appropriate Public Education (FAPE): A program created to suit a child's educational needs to help them succeed and equip them for higher education and social independent development (Wrightslaw, 2017).
- Least Restrictive Environment (LRE): Special Education students are entitled to receive their education in a regular learning environment as their peers (Morin,2020).

FAPE is a critical component of IDEA. Schools are required to provide access to general education services for children with disabilities in their general education settings, as much as possible. FAPE does not mean that schools must provide the "best" education, but that it meets the educational needs of students with disabilities to the same extent, or "equal to," the needs of non-disabled individuals are met. FAPE does mean that children with disabilities are provided with what they need through the provision of modifications, accommodations, and support services.

All children, regardless of disability, may require accommodations in the learning environment to be successful. Teachers implement best practices to make appropriate accommodations in their instructional delivery to meet the identified needs of every child in their classroom. FAPE requires schools to make accommodations and modifications, in accordance with the student's Individualized Education Plan (IEP), so every child can access the curriculum to the greatest extent possible and achieve satisfactory success.

Accommodations and modifications are oftentimes confused. An accommodation changes ***how the student learns*** the material while a modification changes ***what a child is taught or expected to learn***. Let's look at some examples to help make this a little clearer. Accommodations generally fall under one or more of these categories: presentation, response, setting, timing, scheduling, and/or organization. While not an exhaustive list, the chart below provides examples of each accommodation.

ACCOMMODATION	DEFINITION	EXAMPLES
Presentation	How information is presented	• Audio recordings • Reduced number of items on a page • Visual representation of auditory information • Oral and written directions
Response	How the student completes the task/assignment/test	• Dictate response • Calculator • Computer
Setting	Where the child completes the task/assignment/test	• Preferential seating • Quiet space • Special lighting or acoustics
Timing	Time student is provided to complete the task/ assignment/test	• Extended time • Shortened sessions • Chunking information • Frequent breaks
Scheduling	How and when the child completes the task/ assignment/test	• Take a test over several days or several timed sessions • Schedule tasks at best time of day for student • Provide more time
Organizing	How learning materials are organized and presented	• Graphic organizers • Color coding • Notebook organizers

An academic modification is a change to ***what*** the child is expected to learn in school. Curriculum standards identify what each student is expected to learn at each grade level. When the curriculum is modified, the child will have lower expectations for mastering content standards and in some cases may not be exposed to certain content. An example of a modification is to provide less schoolwork or simpler assignments. Other examples include exempting a student from projects, limiting opportunities for engaging in collaborative work with peers, and completing alternate work. It is recommended that schools make academic accommodations prior to modifying the curricular content the student is exposed to and has opportunity to learn.

Some students who struggle in school may not be eligible for special education services. Section 504 of the Rehabilitation Act helps to ensure formal plans are developed to provide students with the supports they need and prevent discrimination. This is a civil rights law. 504 plans are developed to ensure that all students have access to curriculum in a general education setting and can achieve satisfactory success. To be protected under Section 504, a student must be determined to: (1) ***have a physical or mental impairment that substantially limits one or more major life activities;*** or (2) have a record of such an impairment; or (3) be regarded as having such an impairment. (U.S Department of Education, Office of Civil Rights). These 504 plans identify accommodations that must be implemented to legally ensure that students will be treated fairly at school. Some examples of 504 accommodations include:

504 PLANS	DEFINITION	ACCOMMODATIONS
Section 504 of Rehabilitation Act Civil rights law *(Steven J Bachrach, MD: Kids Health)*	Have a physical or mental impairment that substantially limits one or more major life activities. Examples: • Walk, breathe, eat, or sleep • Communicate, see, hear, or speak • Read, concentrate, think, or learn • Stand, bend, lift, or work	• Preferential seating • Extended time on tests and assignments • Reduced homework or classwork • Verbal, visual, or technology aids • Modified textbooks or audio-video materials • Behavior management support • Adjusted class schedules or grading • Verbal testing • Excused lateness, absence, or missed classwork • Pre-approved nurse's office visits and accompaniment to visits • Occupational or physical therapy

Regardless of whether a student has an IEP or a 504 plan, every teacher wants to provide engaging lessons that invoke curiosity and a desire to learn. Fostering student engagement involves removing the barriers that impede a student's ability to learn. The Ripken STEM Guidebook will provide accommodations and modifications for the lessons included to ensure compliance with IDEA and 504 Plans, however, they are generally best practice for all students. Providing academic accommodations and modifications will enable each student to fully engage in the thrill of learning.

IEP ACCOMMODATIONS CHECKLIST

STUDENT:	DOB:	GRADE:
CASE MANAGER:	HOMEROOM:	
DATE:	EXCEPTIONALITY:	

IEP GOAL PAGES: ☐reading ☐math ☐written expression ☐speech ☐behavior

The following accommodations are needed for this student throughout the school day:

Materials

_ Audio text or other materials
_ Pre-teach materials
_ Use highlighter tape or highlight materials
_ Use manipulative sets
_ Provide copy of notes after student attempts
_ Use large print
_ Adapt tasks based upon student mastery
_ Clarify expectations for work
_ Use rubrics
_ Simplify language

Avoid penalizing for:

_ Alternative formatting
_ Use of specialized equipment
_ Calculator
_ Other: _____

Assignments

_ Use written backup for oral instructions
_ Reduce difficulty level
_ Shorten assignments
_ Give extra cues or prompts
_ Give directions in small distinct steps
_ Provide exemplars/ models
_ Limit penalizing for errors related to disability
_ Provide alternate activities, same content

Time Management/ Motivation/ Reinforcement

_ Use visual schedule
_ Use a calendar or journal
_ Clarify for understanding
_ Teach study skills
_ Have student repeat directions
_ Establish timelines for work
_ Plan for generalization design/write/use long-term assignment
_ Timelines
_ Give transition warning
_ Request parent reinforcement
_ Use study sheets to organize material
_ Review and practice in real situations
_ Teach skill in several settings/environments
_ Connect skills to student's life
_ Verbal praise
_ Nonverbal (visual) cues to keep working
_ Offer choices
_ Positive reinforcement/ Behavior chart
_ Behavior Intervention Plan
_ Other:_____

Testing Adaptations	**Presentation of Subject Matter**
_ Allow oral responses _ Read test to/ with student _ Preview test language _ Extended time _ Short answer vs. open-ended _ Multiple choice vs. short answer _ Modified format (i.e. white space, word bank) _ Shortened questions/ limit answer choices _ Taken in resource room _ Retest at teacher's discretion _ Grades averaged at teacher's discretion _ Other:_____	_ Use individual/small group instruction _ Provide guided notes _ Provide models _ Allow use of manipulative sets _ Highlight critical information _ Pre-teach vocabulary _ Simplify language or reading level of assignment _ Other:_____

Academic

_ Allow the use of calculator, number line, or other tools as appropriate
_ Group similar problems together
_ Provide less problems
_ Use graph paper to write problems
_ Provide "math facts" sheets or charts
_ Items read to or with student
_ Break multiple step items into small steps
_ Read directions to student
_ Allow more time on assignments
_ Allow activity breaks
_ Don't use timed activities
_ Allow short breaks between activities
_ Ignore minor movement within assigned area
_ Allow student to stand and work
_ Rework assignments in resource/ with resource teacher
_ Grades averaged at teacher's discretion

Handwriting

_ Use worksheets that require less graphics
_ Allow work to be recopied when sloppy
_ Provide a note-taker or copies for student
_ Allow print vs cursive
_ Provide a model for writing information
_ Other:_____

Environment

_ Preferential seating in classroom
_ Preferential seating in lunchroom
_ Reduce visual distractions
_ Allow movement within assigned area
_ Use a study carrel
_ Define areas concretely

Socialization Supports

_ Peer tutoring
_ Use cooperative learning
_ Focus on process end product
_ Teach social skills
_ Cooperative learning projects
_ Allow opportunities to help other students
_ Other:_____

Home

_ Have a second set of materials at home
_ Use a home-school communication program
_ Have parent's preview or review material
_ Link learning/ behavior activities to family routines
_ Other:_____

Additional Information:

IEP ACCOMMODATIONS CHECKLIST

									STUDENT NAME:
									Give short and concise directions
									Provide copy of notes/study guide
									Provide homework sheet/ agenda
									Read materials/tests aloud
									Accept close approximations
									Reduce number of problems
									Take tests/retest in separate class
									Allow oral responses
									Allow extended time to respond
									Use concrete manipulatives
									Use graph paper in math
									Present information aloud
									Use study carrel to eliminate distractions
									Repeat directions as needed
									Use a number line in math
									Use cover sheet for math problems
									Give student a copy of their schedule
									Break material into manageable parts
									Tape text/ audio materials
									Present information visually

Note: Place an "X" next to a student's name if the student receives the accommodation listed in the column.

Created by: Erin Shultz 2012

									STUDENT NAME:
									Use a reading marker
									Write assignments on board
									Use graphic organizers
									Use drill and repetition
									Peer tutor/ helper
									Check work frequently for understanding
									Difficult assignments completed in separate class
									Provide immediate feedback
									Other Information

Note: Place an "X" next to a student's name if the student receives the accommodation listed in the column.

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STEM AND THE DEVELOPMENT OF ESSENTIAL SKILLS

STEM activities provide an excellent opportunity to develop the critical and essential skills needed to be successful in life. A critical component of a successful STEM program is student collaboration. Educators have long known the importance of promoting a collaborative learning environment that fosters student engagement within their classrooms. The inclusion of belonging to a group where a student feels valued, builds resilience, and develops social competence, empathy, and effective communication skills is essential for students. The interactive and interdependent components of cooperative learning offers the emotional and interpersonal experiences that boost emotional awareness, judgment, critical analysis, flexible perspective taking, creative problem-solving, innovation, and goal-directed behavior. Embedding essential skills in STEM activities is a wonderful way to nurture a positive school culture, develop positive relationships, increase engagement, and foster independence.

One of the leaders in schoolwide Social Emotional Learning (SEL), CASEL (Collaboration for Academic, Social, and Emotional Learning) defines social, emotional learning as "the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions, and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions.

https://schoolguide.casel.org/what-is-sel/whatissel/

CASEL have identified five core competencies:

- Self-awareness
- Self-management
- Social awareness
- Responsible decision-making
- Relationship skills

Let us look at how you teach essential skills during STEM activities:

SELF-AWARENESS

Self-awareness is defined as the ability to recognize and understand how your emotions, thoughts, and values impact your behavior (CASEL). During STEM activities, students will experience a range of emotions from excitement to frustration. Explicitly teaching students how to recognize their emotional state through modeling assists them in identifying their own emotions. Educators should provide options for students when they are feeling frustrated: take a deep breath, ask a peer for help, take a break, go to the "quiet" area of the room. Educators should lso explain to children that when they are learning new skills they will make mistakes, get confused, and may need assistance. These are all common feelings when we are trying to learn something new. Being aware of our feelings and having options for how to manage them will enable students to successfully navigate challenging emotions.

SELF-MANAGEMENT

Self-management is the ability to manage one's emotions, thoughts, and behaviors effectively in different situations and to achieve goals and aspirations. Classrooms need to be structured with spaces and materials that assist students with self-regulation. You should provide a calming corner, think space, amygdala reset room or whatever you choose to call the space students can go to when they need time away from the group – either self-selected or teacher directed. Including sensory manipulatives can help soothe anxious or frustrated students. Including squish balls, bands, Thera-putty, fidgets, or any sort of manipulative helps children relax, stay calm, and focus on a particular event or situation. Think sheets are also another option for students that need to process situations through writing. Providing students with options to self-manage their emotions and behaviors enables them to independently get their needs met and then proceed with the activity.

SOCIAL AWARENESS

According to the CASEL core competencies, social awareness is the ability to understand the perspectives of and empathize with others, including those from diverse backgrounds, cultures, and contexts. STEM activities provide opportunities for students to demonstrate empathy towards others, actively listen to others' point-of-view, and recognize strength in their peers. Collaboration is a key element in any STEM lesson and therefore reinforcing social awareness skills is imperative. Prior to the lesson, remind students that they will be assisting one another during the activity. They will be required to respect each other's contributions to the activity and collaboratively solve problems that arise. Providing a visual sequence for resolving problems, listening to other's opinions, and respectfully disagreeing serves as a great resource. Younger students may require scripted phrases.

RESPONSIBLE DECISION-MAKING

Responsible decision-making is the ability to make caring and constructive choices about personal behavior and social interactions across diverse situations. This includes the capacity to evaluate the benefits and consequences of various actions for personal, social, and collective well-being. STEM activities provide opportunities for students to make judgements about outcomes while considering and analyzing consequences. Critical thinking skills will be employed to consider alternatives, anticipate outcomes, and consider consequences.

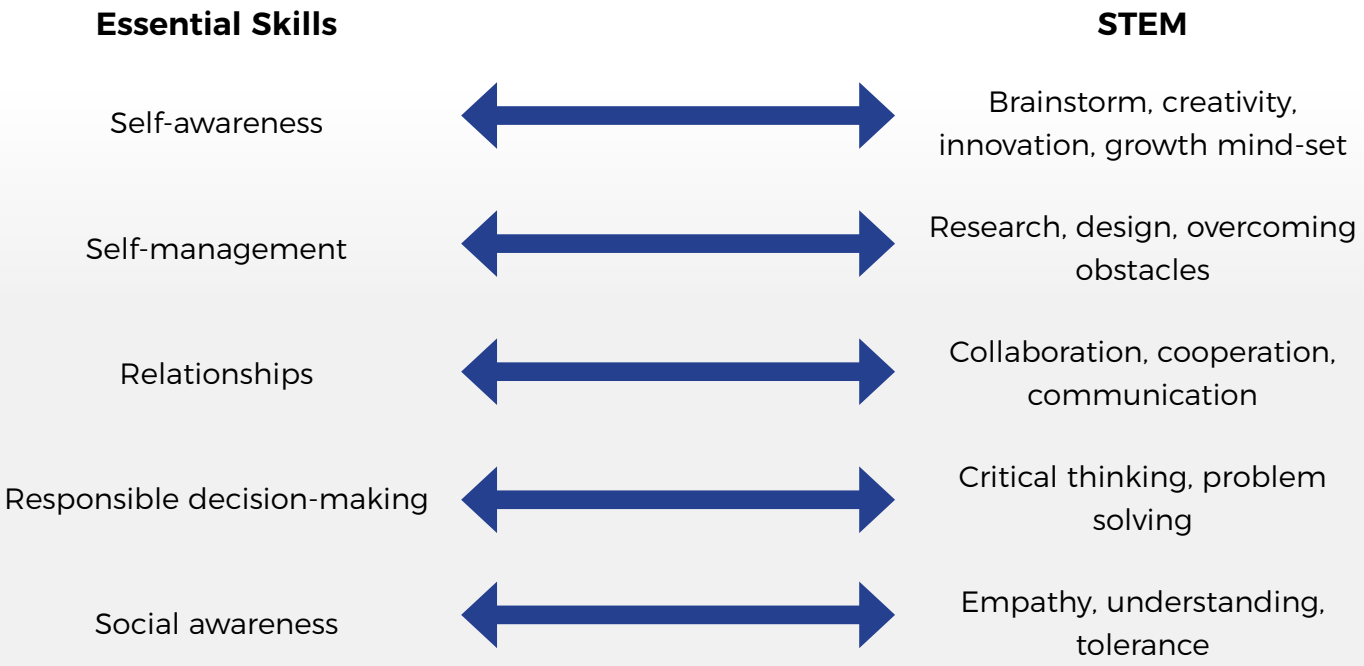
RELATIONSHIP SKILLS

Relationship skills are a core competency in STEM lessons as well as success in life. CASEL defines it as: the ability to establish and maintain healthy and supportive relationships and to effectively navigate settings with diverse individuals and groups. This includes the capacity to communicate clearly, listen actively, cooperate, work collaboratively to problem solve and negotiate conflict constructively, navigate settings with differing social and cultural demands and opportunities, provide leadership, and seek or offer help when needed. These essential life

skills need to be explicitly taught and reinforced in every lesson. Visual definitions and examples of how to build positive relationship skills serve as a great resource to students.

Each lesson in the Ripken STEM Guidebook will highlight essential skill competencies involved in the activity. Prior to implementing a STEM activity, review the essential skills needed for the lesson. It may be necessary to model the appropriate behavior to provide explicit directions regarding social interactions. Provide a visual of the skills for easy reference during the activity. Throughout the activity, roam around the room and acknowledge students who are displaying appropriate group social skills.

ESSENTIAL SKILLS AND STEM CONNECTIONS



Resources:

CASEL's SEL Framework: https://casel.org/casel-sel-framework-11-2020/

Dr. Jacie Maslyk; STEM and SEL: Important Connections for Student Development; https://carlyandadam.com/thecarlyandadam/stem-and-sel-important-connections-for-student-development

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ESSENTIAL SKILLS STRATEGIES

ESSENTIAL SKILLS	STRATEGIES
Self-Awareness	• Promote positive thinking and perseverance – "I can do this." • Identify feelings (happy, excited, frustrated). • Students identify feelings of frustration and ways to manage it – take a deep breath, go to a relaxation space in the room, talk to an adult. • Students are aware of their "wants" and how to manage them during the activity. • Students understand they are working as a group and how to be a productive member of the group. • Students identify how their emotions impact others.
Self-Management	• Promote positive thinking and perseverance – "I can do this". • Students will regulate their emotions (with adult support, if needed) to remain engaged in the activity or remove themselves for a break if needed. • Students will seek assistance when needed. • Provide students with options if they need to take a break to self-regulate. • Student will advocate for themselves. • Students keep their materials organized. • Practice self-monitoring strategies (checklists, timers) to keep on track. • Demonstrate perseverance by working through challenges. • Set plans and work towards a goal.
Social Awareness	• Respect others by listening carefully. • Recognize differing points of view and perspectives. • Identify and interpret social cues (verbal and nonverbal) to determine how others feel. • Identify your role/job and responsibilities. • Value the opinions and feelings of others. • Accept directions from adults. • Show respect for property and materials. • Be helpful to others in the group.

ESSENTIAL SKILLS	STRATEGIES
Responsible Decision-making	• Students can explain and demonstrate the stop, think, act strategies. • Review norms for how you want to be treated during problem-solving. • Explicitly identify steps for problem-solving (visual provided). • Define the responsibility of each individual when problem-solving. • Recognize when a situation is a problem and what makes it a problem (ex. safe vs unsafe, etc.). • Identify choices that may result in a problem. • Identify the possible positive and negative effects a decision could have on themselves and others. • Identify situations that require assistance from an adult. • Consider multiple perspectives when solving a problem. • Reflect on outcomes of the problem's solution. • Students can identify physical, intellectual, emotional, and social safety considerations for themselves and for others.
Relationship Skills	• Review facial expressions, body language, gestures, words, and tone of voice of others to understand others' thoughts and feelings. • Demonstrate cooperative behaviors with others (listen, encourage, acknowledge opinions, compromise, reach consensus). • Contribute to the achievement of group goals. • Recognize and respect boundaries. • Take turns. • Show fairness. • Offer and receive help. • Give and receive constructive feedback. • Students use constructive strategies to communicate their perspective and listen openly to the perspectives of others to solve a problem. • Students advocate for their needs and compromise with others.

RESEARCHED BEST PRACTICES FOR STEM HANDS-ON LEARNING ACTIVITIES

STEM hands-on learning activities incorporate multiple modes of learning: kinesthetic, auditory, visual, and reading/writing. Students engage in problem solving, collaboration, communication, critical thinking, and creativity during each activity. While it can be a challenge to integrate hands-on learning activities, research demonstrates that "by manipulating the new learning in several ways through different processes and sensory modalities the learner builds more interconnections" (p. 55 Differentiation and the Brain by David A. Sousa and Carol Ann Tomlinson). Structuring the learning environment, including accommodations and modifications, enables every student to engage in the activity and make meaningful connections to the world around them.

STRATEGIES FOR IMPLEMENTING HANDS-ON STEM ACTIVITIES:

Physical environment

Setting up the physical environment is essential to achieving active engagement, creating a safe learning space, and fostering independence in the learner. Consideration of the layout of the furniture provides structure to the space and allows students to move around during the activity. Boundary settings allow students with disabilities to identify where they should be to perform the task. It may be necessary to move desks into small groups, outline space on the floor with tape and or move furniture out of the way to have a wide-open space. Consider the lighting in the room, access to materials, placement of visuals to support learning and entry/exit ways in the room. Plans for the layout of the physical space, traffic patterns, transitions, obtaining and returning materials, interaction with other students, and how to achieve the new layout all need to be considered prior to engaging in the lesson.

Visual Structures: Aid and Support Communication

Visual structures aid and support communication, enhance working memory, improve organization, and allow students to review expectations and the activity sequence, as well as proceed through the activity without requiring adult support.

- Organize materials prior to implementing the lesson:
  - Charts: expectations, schedule, time, social skills, voice volume
  - Manipulatives/materials
  - Handouts
  - Adaptive materials
  - Teamwork roles/name tags
- List the sequence of activities the group/student is to perform.
- Identify the amount of time the group/student should spend on each section of the activity (Timer; see appendix).
- Provide written copy of group expectations.

- Provide choice boards when appropriate.
- Provide pictures with labels of the materials being used in the activity.
- Implement self-regulation strategies: if a student becomes frustrated, anxious, or overwhelmed during the activity, provide a space for them to go to in the room to relax and calm down. Calming activities should be available in this space.
- Provide each group/student with a checklist of activities to be completed.
- Provide a reflection form to each group/student to record their thinking and evaluation about the activity.

Essential Skills Review/ Visual Behavioral Supports

- Review expectations for collaborating with peers (example below):
  - One student speaks at a time.
  - Every student participates in the activity.
  - Students help one another.
  - Students share materials.
  - Students use kind words to ask for help, request materials, or share their thinking.
- Pre-teach/review essential skills required for lesson.
- Review problem solving skills students are to use when they face a problem or struggle.
- Demonstrate how to use the materials.
- Teacher models how students can request adult support if needed.
- Students repeat expectations and/or turn to a peer and share with him/her the expectations.
- Timely and useful feedback provided throughout the activity.

Providing Directions

Implementing hands-on activities increases the level of excitement for learning in children. As a result, students may not be listening to the teacher as he/she provides directions and may become confused and lost once the activity begins. To prevent students not listening to and understanding the directions, there are steps the teacher can take to avoid miscommunication:

- Get student's attention: "all eyes on me."
- Provide one step of the direction at a time and wait for the student to complete the step.
- Ask the student to repeat the direction and/or tell the directions to a peer.
- Review the written directions with the students, having them repeat each step aloud.

Task Completion Checklist for Students with Disabilities (TEACCH Method)

Task completion is a work structure derived from the TEACCH (Treatment and Education of Autistic and Related Communication Handicapped Children) method (University of North Carolina), used for students with disabilities. Providing students with answers to these questions allows them to progress through the activity independently.

- How much work?
- What work?
- What is next?
- Where do I place finished work?
- What can I do when I am finished?

A visual chart providing this information fosters independence in students with disabilities.

Prepare the Brain for Learning

Prior to beginning any tasks, it is important to check in with the students to see how they are doing. Conducting a mental check in is one way to see if students are ready for learning. Simply asking students to rate how they are feeling helps build relationships and helps students feel valued. This is a good opportunity to address any concerns or anxieties that may exist. Breathing exercises are another wonderful way to prepare students for learning. "Simple breathing exercises can help students transition from one space into another, from one activity into the next, especially when they need to focus their attention. Exercises that help students breathe more intentionally can also help them regulate their feelings. Breathing of this kind can help kids deal with their stresses, frustrations, fears, and concerns. It can help to ground them and be more present in the moment" (Morningside Center, 2020).

Classroom Management

Effective classroom management is imperative when implementing hands-on STEM activities. Two of the most challenging aspects of implementing stimulating and engaging activities with manipulatives is management of student behavior and structure of the environment and activities. Eliminating down time and ensuring that each student has a role in the team activity will encourage active engagement.

Teamwork is fundamental to STEM activities. Therefore, teachers must explicitly teach students expectations for working in a group. Defining roles for each student will assist with understanding how they should function as a team. Rotating job responsibilities provides each student an opportunity to learn each of the roles while actively engaging in the activity. Each group, or the teacher, needs to identify the role of each member. As students are learning the responsibilities of each role, the teacher should recognize students demonstrating expectations.

CAPTAIN

Gives out directions to the group.

TIMER

Keeps the group on time.

PROJECT TESTER

Does the final test to make sure the plan is successful.

MATERIALS MANAGER

Gets the materials for the group.

RECORDER

Writes down the group's process to be shared with the class.

SPEAKER

Shares information for the group to the class.

Strategies for engaging every student using the Engineering Design Process are included in the graphic below.

ENGINEERING DESIGN PRINCIPLES AND CLASSROOM MANAGEMENT

Ask	Clarify the problem: • Every student records the problem they are trying to solve. • Captain assists the group in comparing their answers to identify similarities and differences and arrive at one problem statement. • Group Recorder writes the problem statement they are trying to solve on the group worksheet. • The Timer keeps the group on task with frequent reminders.
Imagine	Brainstorm practical solutions: • Every student records their ideas. • Captain calls on each student to share their ideas. • The Recorder writes down the ideas the group will try. • The Timer keeps the group on task with frequent reminders.

Plan	Identify how the group will implement the plan: • Captain has each student share their plan. • Group decides on which plan to try first. • Each member of the group tries the plan. • The Project Tester does the final plan to make sure it is accurate. • Recorder writes down the plan. • The Timer keeps the group on task with frequent reminders.
Create	The Captain explains to the group how they will create the plan: • The Material manager retrieves all needed materials for the group and distributes them. • Each member uses the manipulatives to create the plan, noting what works and what does not work. • The Recorder writes down feedback from each member. • The Timer keeps the group on task with frequent reminders.
Test	• The Captain makes recommendations from the feedback on how to edit the plan. • The Material manager retrieves any new materials needed. • Each member re-creates the new plan until they have successfully resolved the problem. • The Recorder writes down the revised plan. • The Timer keeps the group on task with frequent reminders.
Share	• The Speaker reviews what the recorder has written down for the group. • Final edits are made to the share-out information. • The Timer keeps the group on task with frequent reminders. • The Speaker shares the group's plan with the rest of the class.

Communication is another key element to effective STEM implementation. Prior to every lesson, the teacher needs to explicitly review the expectations of how students speak to one another when working in a group. Options should be available for students to temporarily remove themselves from the group to collect their thoughts and regulate their emotions. This may be a quiet space in the room, use of calming materials (squish ball, fidget, etc.), or temporary removal outside of the classroom. The Captain is responsible for monitoring the communication of the group. If the group is unable to resolve an issue by themselves, an adult needs to support the group in getting back on track and resolving the issue. Learning how to communicate effectively, accept another's perspective, and use feedback to alter your own thinking are all essential skills for life.

Structuring hands-on STEM activities fosters effective inquiry-based experiences for students. Taking time to plan for the pre-requisite structures involved and prepare students minds for learning yields significant benefits. When students receive explicit directions on how to proceed through the activity, know how to collaborate with peers, are provided with visuals to support their learning, and can solve problems effectively, they are able to engage meaningfully in STEM activities.

ENGINEERING DESIGN PROCESS FOR PROBLEM SOLVING

Ask	What is the problem?
Imagine	Brainstorm possible solutions.
Plan	Develop a plan for using your solutions.
Create	Organize the materials needed to execute the new plan.
Test	Try the plan and see if it solves the problem. If the plan does not work, go back to the brainstorm solutions and try another one.
Share	Share your results with the group.

STEM TEACCH WORKSHEET

How much work?

What work?

What is next?

Where do I place finished work?

What can I do when finished?

JOB RESPONSIBILITY TAGS

CAPTAIN

Gives out directions to the group.

TIMER

Keeps the group on time.

PROJECT TESTER

Does the final test to make sure the plan is successful.

RECORDER

Writes down the group's process to be shared with the class.

SPEAKER

Shares information for the group to the class.

MATERIALS MANAGER

Gets the materials for the group.

ADAPTED LESSON PLAN

Lesson: _____

IEP/504 Accommodations and Modifications	
Essential Skills Focus	
Physical Environment	
Visual Structures	
Directions	
TEACCH Checklist	
Teamwork Roles	
Classroom Management	

REFLECTION

How did you work together?	
What part was challenging?	
What part did you enjoy the most?	
What would you do differently?	

ADAPTIVE LESSONS

ADAPTED LESSON IMPLEMENTATION GUIDE

It is recommended that lessons be implemented in accordance with the following sequence to ensure compliance with Special Education regulations and effectively manage classroom behaviors, so every student can engage in creative discovery.

Compliance

- Identify Special Education accommodations and modifications needed in accordance with students' IEP.

Adapted Lesson Plan Chart

- Review and complete each component of the Adaptive Lesson Plan chart to organize and prepare for the lesson.

Objective

- State the objective of the lesson in developmentally appropriate language.

Essential Skills

- Prior to teaching the lesson, explicity teach the Essential Skills needed to participate in the lesson. It is important that students practice the skills and are provided a visual to reference during the activity.

Prerequisite Lesson

- Teach Adapted Lesson Plan Additional Activities to provide foundational knowledge and prerequisite skills to foster student comprehension and engagement.

Lesson Plans

- Complete additional lesson plans using the same procedures described above.

Closing

- Complete Closing Activity Worksheet to provide opportunity for reflection and feedback.

Reflection

- Reflect on lesson and add notes to Adapted Lesson Plan Chart

ADAPTED LESSON CHART: BEE-BOT

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabulary with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-awareness: students will be able to take turns. • Self-management: students, with adult support, will demonstrate a variety of strategies to manage strong feelings. • Relationship skills: students will be able to demonstrate listening skills by taking turns in conversations.	
Physical Environment	• Whole group instruction format to introduce Bee-Bot vocabulary and function. • Small group work – either combine desks or identify space on the floor (tape, furniture barriers). • Materials organized and laid out for students to get when instructed to do so.	

	RECOMMENDATION	REFLECTION
Visual Structures	• All materials are laid out, charged, and working. • Steps for completing the task are written and posted. • Teamwork role nametags are ready. • Set timer for each step. • Provide group checklist of tasks to be completed.	
Directions	• Gain student attention: all eyes on me. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity.	
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete. • What work? Show the student what they will be doing by modeling and providing a visual (worksheet). • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work. • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area).	

	RECOMMENDATION	REFLECTION
Teamwork Roles	• Teacher reviews and/or models each student role involved in the activity. • Teacher, or captain, identify a student to fill each role involved in the activity. • Teacher models where to find the visual and written description of each role's requirements. To ensure every student participates, it is recommended that every student record their ideas on the provided worksheet and share their information with the student in the identified role.	
Classroom Management	• Prepare paper copies of the Bee-Bot worksheet for every student to practice identifying function keys. • Ensure every Bee-Bot is fully charged and working. • Prepare coding cards for students to practice creating codes. • Remind students of opportunity to take a break when needed and where they can go for the break. • Review expectations for working in a group: voice level, requesting support, obtaining materials, problem resolution. • Provide engineering design principal worksheet. • Distribute group roles with a reminder of expectations for each role.	

ADAPTED LESSON PLAN: BEE-BOT

ADDITIONAL ACTIVITIES

Introduce vocabulary: (include visual)

- Bee-Bot
- Forward
- Right
- Left
- Back
- On/off
- Clear

Have students stand up and move in the direction of the sign (up, down, forward, back).

Show students a code  and have them move in the direction shown.

Show one direction card at a time, students move, then show next card.

Allow students to make up a code for the group.

Practice with Bee-Bot

Students point to the direction key as the teacher names them.

Teacher models how to code the Bee-Bot using sign cards. One recommendation is to put sign cards face down and turn over one at a time. Complete the action on the sign card. Turn over the next card. Complete the action step on the card. Continue until all codes are completed.

Allow students to create codes using cards.

Warm up

Prior to every activity, review vocabulary and actions using visuals.

Remind students that if the code is incorrect, they can clear it and try again. Demonstrate this for students using self-talk: "that was wrong, ok sometimes you get it wrong, let me try it again with a different code." If they are frustrated, they can take a break and come back when they are ready.

INTRODUCTION TO BEE-BOT

OBJECTIVE

Students will learn the function of the buttons on the Bee-Bot and how to code the Bee-Bot.

MATERIALS

- **Bee-Bot**
- **Bee-Bot worksheet**

PREPARATION

Students will work in a small group with the teacher. The teacher holds up the Bee-Bot and asks the students to share their observations: color, stripes, buttons. Students identify the various keys and their function:

Students label the keys on their worksheet. For practice, the teacher can call out a key and have the student put their finger on the symbol.

CODING

Once students can identify the keys and their direction, the teacher then introduces how to code.

Teacher will use cards for each function to program a code. Teacher models how to program a code using the cards:

1. Clear
2. Forward
3. Go

As the teacher performs the function, he/she turns the card face down. This will demonstrate the function is completed and to move to the next card.

Students practice programming codes using the cards.

EXPLORATION

Students continue to program codes using the cards. Students can develop program codes for other students to complete. Once students have demonstrated mastery, the teacher can program the Bee-Bot and have the students identify the code.

ADAPTED LESSON CHART: LITTLEBITS

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabular with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-awareness: students will be able to take turns. • Self-management: students, with adult support, will demonstrate a variety of strategies to manage strong feelings. • Responsible Decision-Making: students will recognize when a situation is a problem and offer possible solutions.	
Physical Environment	• Small group instruction format to introduce littleBits vocabulary and function. • Small group work – either combine desks or identify space on the floor (tape, furniture barriers). • Materials organized and laid out for students to get when instructed to do so. • Visuals posted and desktop copy available. • Computer available to view littleBits video.	

	RECOMMENDATION	REFLECTION
Visual Structures	• All materials are laid out. • Steps for completing the task are written and posted. • Teamwork role name tags are ready. • Set timer for each step. • Provide the group a checklist of tasks to be completed.	
Directions	• Gain student attention: all eyes on me. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity.	
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete. • What work? Show the student what they will be doing by modeling and providing a visual (worksheet). • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work. • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area).	

	RECOMMENDATION	REFLECTION
Teamwork Roles	• Teacher reviews and/or models each student role involved in the activity. • Teacher or Captain identify a student to fill each role involved in the activity. • Teacher models where to find the visual and written description of each role's requirements. To ensure every student participates, it is recommended that every student record their ideas on the provided worksheet and share their information with the student in the identified role.	
Classroom Management	• Prepare paper copies of the littleBits worksheet for every student to practice identifying the parts. • Show student video on getting started with LittleBits. • Ensure every group has the needed number of each piece. • Remind students of the opportunity to take a break when needed and where they can go for the break. • Review expectations for working in a group: voice level, requesting support, obtaining materials, and problem resolution. • Provide Engineering Design Principal worksheet. • Distribute group roles with a reminder of expectations for each role. • The teacher circulates throughout the room checking on each group and provides support.	

ADDITIONAL ACTIVITIES

Warm up

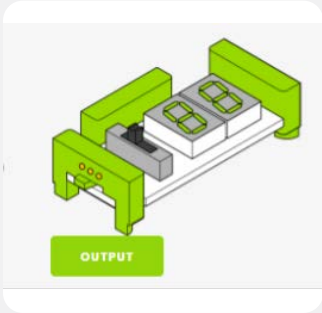
Show students pictures of a switch, a buzzer, and a button circuit. Explain to students what a circuit is and how it works.

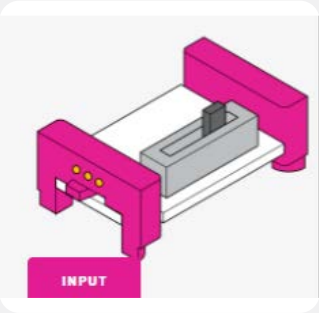

Ask students to find examples of each around the classroom/school.

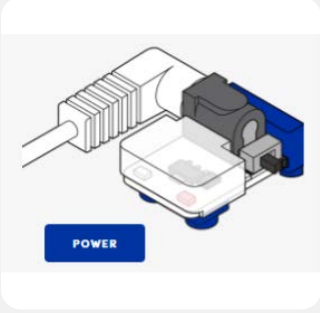
Introduce vocabulary

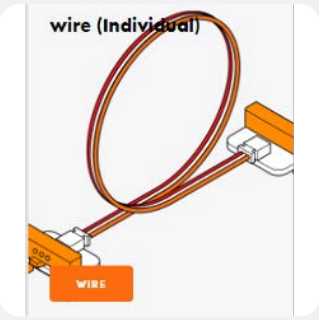
https://drive.google.com/file/d/1Dk_FW5Bn3gBO6klF_87C96txx-FFFoHR/view

- Power Bits – Bitsnap, Bit Fee
- Power – Blue
- Input – Pink
- Wire – Orange
- Output – Green









Have students identify each part of littleBits and describe the function.

Students will watch the video Introducing littleBits to reinforce name, color, and function of each part.

Students take turns locating the littleBits parts and functions.

Review parts and function each time students work with littleBits.

Making connections

The order of connecting littleBits matters.

- Make flash cards for the littleBits, so they can be placed on the desk one at a time
- Practice having students identify the part and function on flash cards.

Show students a picture of the self-driving vehicle they will make with littleBits. (Intervention Guide pages 32-33)

- Students identify each part needed to make the vehicle.
- Teacher places the flash card for each piece in the correct order on the table.
- Student assembles the vehicle by identifying the part on the flash card and connecting it to the next piece until the vehicle is completed.
- Students test to make sure the circuit works.

Students create their own vehicles using littleBits.

ADDITIONAL ACTIVITIES

introduce vocabulary (include visual)

- Makey-Makey board
- Earth
- Space
- Click
- Alligator cables
- White wires
- USB cord

Circuit

Define circuit.

Students will make a "human" circuit demonstrating closed and open circuits.

Students can make circuits using pipe cleaners to keep as a reminder.

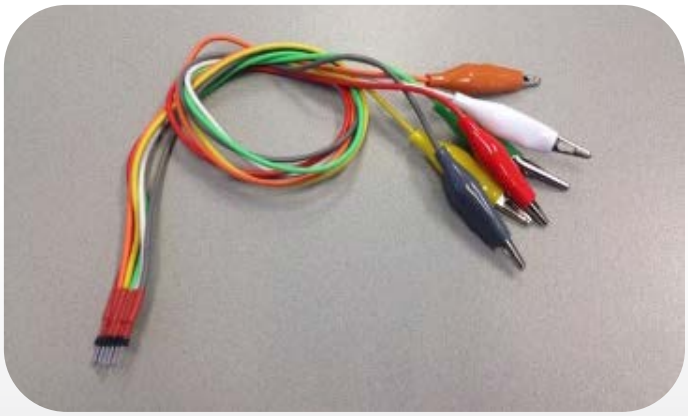
Ask students to think of other ways to create closed circuits.

Practice with Makey-Makey

Students point to the various parts of the Makey-Makey board as the teacher names them.

Teacher models how to connect the USB cord to the computer and the Makey-Makey board.

Teacher models how to connect the alligator cable to Earth. Students point to Earth on the Makey-Makey board worksheet.



Teacher models, and/or students view video, how to make music: piano app, fruit piano.

Warm up

Prior to every activity, review vocabulary using visuals.

Make sure computers and Makey-Makey are connected properly and the computer is on the correct website.

Remind students how to get assistance if they have trouble. Also, each student will be producing their own "music," so this is a wonderful opportunity to teach students how to appreciate other students work and provide positive feedback.

ADAPTED LESSON CHART: MAKEY-MAKEY BLOCK CODING

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabulary with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-awareness: students will be able to take turns. • Self-management: students, with adult support, will demonstrate a variety of strategies to manage strong feelings. • Responsible decision-making: students will identify social norms and safety considerations that guide behavior.	
Physical Environment	• Independent workstations with a computer. • Materials organized and laid out for students to get when instructed to do so: Scratch Coding Cards.	
Visual Structures	• Computers are charged and working; headphones are available if needed. • Steps for completing the task are written and posted. • Set timer for each step. • Provide checklist of tasks to be completed.	

	RECOMMENDATION	REFLECTION
Directions	• Gain student attention: all eyes on me. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity. • Students completing the Scratch introductory lessons online will follow directions provided.	
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete. • What work? Show the student what they will be doing by modeling and providing a visual (worksheet). • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work. • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area).	

	RECOMMENDATION	REFLECTION
Teamwork Roles	This is an independent activity, so teamwork roles are not included. Students should be reminded how to proceed through the activity independently, how to request assistance as needed, and take a break if feeling frustrated.	
Classroom Management	• Prepare visual of the Makey-Makey Block Coding Blocks website to practice identifying location and function. • Ensure every computer is fully charged and working. • Headphones are available. • Remind students of opportunity to take a break when needed and where they can go for the break. • Review expectations for working on a computer, requesting support, obtaining materials, and problem resolution.	

ADDITIONAL ACTIVITIES

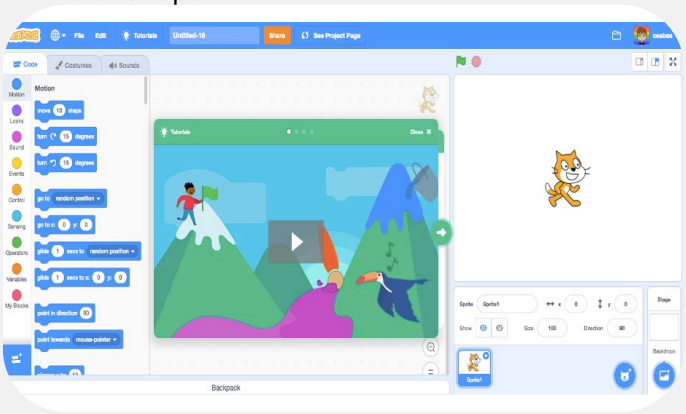
Introduce vocabulary (include screenshot of computer)

Coding is a list of step-by-step instructions that get computers to do what you want them to do.

A sequence is a set of steps that are completed in order. Putting code in a specific order is called "sequencing."

Review label functions on Scratch project page:

- Code
- Costume
- Sound
- Stage
- Backdrops



Practice with Makey-Makey Block Coding

Students go to the website: *https://csfirst.withgoogle.com/dashboard* (this can be done for the students prior to starting the lesson)

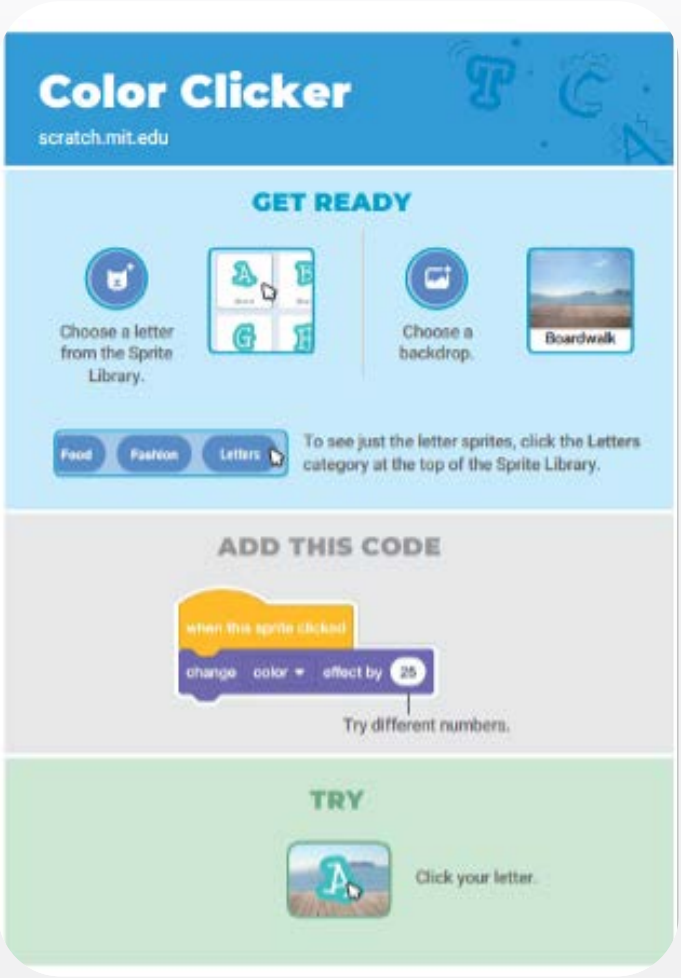
Introductory lessons can be found at: *https://csfirst.withgoogle.com/c/cs-first/en/welcome-to-cs-first/overview.html*

There is a microphone in the bottom left side of the screen which will read the directions aloud to the student. Teacher can do as a group and guide students through the sequence the first time, then students can use headphones and do it independently.

Have students complete all four introductory lessons.

Scratch cards are available for additional guided practice: *https://resources.scratch.mit.edu/www/cards/en/name-cards.pdf*

Scratch Coding Cards are available for purchase or can be made by the teacher.



Warm up

Prior to every activity, review vocabulary using visuals (screenshot).

Make sure computers and Makey-Makey/Scratch is connected properly, and the computer is on the correct website.

Remind students how to get assistance if they need support.

Students can watch the tutorial video prior to beginning the coding sequence if needed.

Teacher will model, with talk aloud, how to create a code sequence.

Depending on the level of mastery, students can complete step by step with the teacher or complete after the teacher completes the code sequence.

ADAPTED LESSON CHART: OZOBOT

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabulary with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-awareness: students will be able to take turns. • Self-management: students, with adult support, will demonstrate a variety of strategies to manage strong feelings. • Relationship skills: students will be able to demonstrate listening skills by taking turns in conversations.	
Physical Environment	• Whole group instruction format to introduce Ozobot vocabulary and function. • Small group work – either combine desks or identify space on the floor (tape, furniture barriers). • Materials organized and laid out for students to get when instructed to do so.	

	RECOMMENDATION	REFLECTION
Visual Structures	• All materials are laid out, charged, and working. • Steps for completing the task are written and posted. • Teamwork roles nametags are ready. • Set timer for each step. • Provide group checklist of tasks to be completed.	
Directions	• Gain student attention: all eyes on me. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity.	
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete. • What work? Show the student what they will be doing by modeling and providing a visual (worksheet). • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work. • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area).	

	RECOMMENDATION	REFLECTION
Teamwork Roles	• Teacher reviews and/or models each student role involved in the activity. • Teacher, or captain, identify a student to fill each role involved in the activity. • Teacher models where to find the visual and written description of each role's requirements. To ensure every student participates, it is recommended that every student record their ideas on the provided worksheet and share their information with the student in the identified role.	
Classroom Management	Prepare: • Paper copies of the Ozobot worksheet for every student to practice identifying function keys. • Ensure every Ozobot is fully charged and working. • Prepare Ozobot worksheets for students to practice creating codes. • Remind students of opportunity to take a break when needed and where they can go for the break. • Review expectations for working in a group: voice level, requesting support, obtaining materials, and problem resolution. • Provide engineering design principal worksheet. • Distribute group roles with a reminder of expectations for each role. • Teacher circulates throughout the room checking on each group and providing assistance.	

ADAPTED LESSON PLAN: OZOBOT

ADDITIONAL ACTIVITIES

https://classroom.ozobot.com/lessons/lnq1oGHjt9QgqluYp0AUlIWAyU/public

Introduce vocabulary

- Bluetooth Antenna
- Color Sensor
- Line Following Sensors
- LED Light
- Proximity Sensors
- Power Button
- Speaker
- Charging Port
- Wheels/Motor

Have students identify each part of Evo and describe the function.

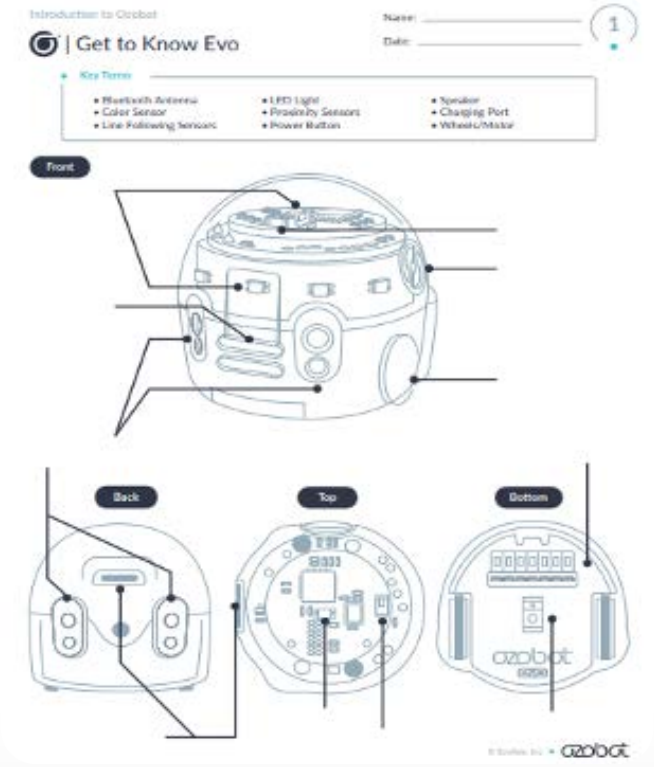
Students will complete the Getting to Know Evo worksheet to reinforce location and function of each part.

Students take turns locating the parts and functions on the Ozobot.

Review parts and function each time students work with Evo.

Calibrate

Define the term “calibrate” and identify items that need to be calibrated: scale, cooking thermometer, scanner, camera, printer, and cell phone.



Students watch the video and calibrate Ozobot.

▶ *https://classroom.ozobot.com/lessons/lnHsHKD0kXTgueqAiT7Pg7jQT3/public*

Warm up

Prior to every activity, review vocabulary using visuals (screenshot).

Make sure computers and Makey-Makey/ Scratch is connected properly, and the computer is on the correct website.

Remind students how to get assistance if they need support.

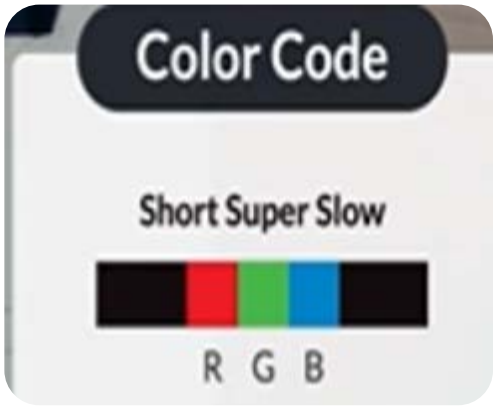
Students can watch the tutorial video prior to beginning the coding sequence if needed.

Teacher will model, with talk aloud, how to create a code sequence.

Depending on the level of mastery, students can complete step by step with the teacher or complete after the teacher completes the code sequence.

Asymmetric Color Codes

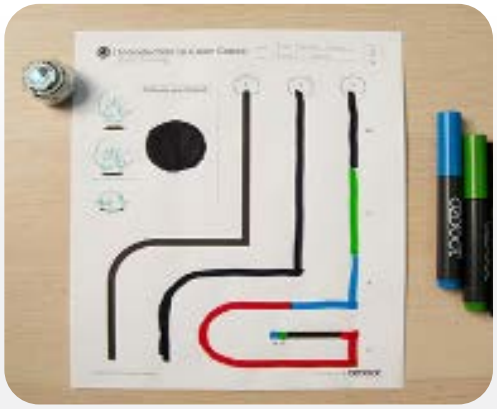
Define color codes – colors used to provide direction to the Ozobot.



Make sure students know abbreviations for colors:

- R = red
- B = blue
- G = green
- BK = black

Practice reading color codes with students identifying the color sequence



Review color codes: students identify color sequence and function of code.

https://files.ozobot.com/stem-education/ozobot-color-codes.pdf

Review several types of codes:

- Speed
- Direction and special moves
- Timers
- Wins/exits
- Counters

Make flash cards for the color codes so they can be placed on the desk one at a time.

Practice having students identify code and function on flash cards.

Students use flash cards to create their own codes.

It is recommended to start with one or two functions to practice coding the Ozobot before introducing the rest. Once students have mastered the first two functions, add on other functions.

ADAPTED LESSON CHART: ROK BLOCKS

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabulary with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-management: students, with advocate for themselves. • Social Awareness: students will show respect for property and materials by using them appropriately. • Relationship Skills: students will demonstrate cooperative behaviors with others (listen, encourage, acknowledge opinions, compromise, and reach consensus).	

	RECOMMENDATION	REFLECTION
Physical Environment	• Small group instruction format to introduce ROK Blocks vocabulary and function. • Small group work – either combine desks or identify space on the floor (tape, furniture barriers). • Materials organized and laid out for students to get when instructed to do so. • Visuals posted and desktop copy available. • Building Plans Booklet available as a resource.	
Visual Structures	• All materials are laid out, charged, and working. • Steps for completing the task are written and posted. • Teamwork roles nametags are ready. • Set timer for each step. • Provide group checklist of tasks to be completed.	
Directions	• Gain student attention: all eyes on me. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity . • Teacher roams around classroom to observe groups.	

	RECOMMENDATION	REFLECTION
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete • What work? Show the student what they will be doing by modeling and providing a visual (worksheet) • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area)	
Teamwork Roles	• Teacher reviews and/or models each student role involved in the activity • Teacher, or captain, identify a student to fill each role involved in the activity • Teacher models where to find the visual and written description of each role's requirements To ensure every student participates, it is recommended that every student record their ideas on the provided worksheet and share their information with the student in the identified role.	

	RECOMMENDATION	REFLECTION
Classroom Management	Prepare: • ROK Blocks available for every student to practice identifying the parts (shape/color) • Ensure every group has the needed number of each piece. • Remind students of opportunity to take a break when needed and where they can go for the break • Review expectations for working in a group: voice level, requesting support, obtaining materials, and problem resolution • Provide Engineering Design Principal worksheet • Distribute group roles with a reminder of expectations for each role • The teacher circulates throughout the room checking on each group and provides support.	

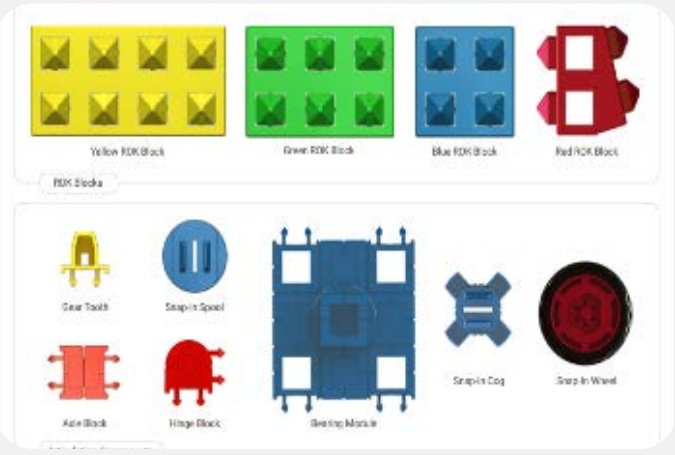
ADDITIONAL ACTIVITIES

Reference Materials

- Foundational Fluencies: Building Plans Booklet
- Foundational Fluencies: Instructor's Guild

Introduce vocabulary (demonstrate with ROK Blocks)

- Rectangle Prism
- Pyramids
- Cube
- Large Yellow Block
- Medium Green Block
- Angled Red Block
- Yellow Gear Tooth
- Blue Snap-in Spool
- Blue Bearing Module
- Blue Snap-in Cog
- Snap in Wheel
- Pink Axel Block
- Red Hinge Block

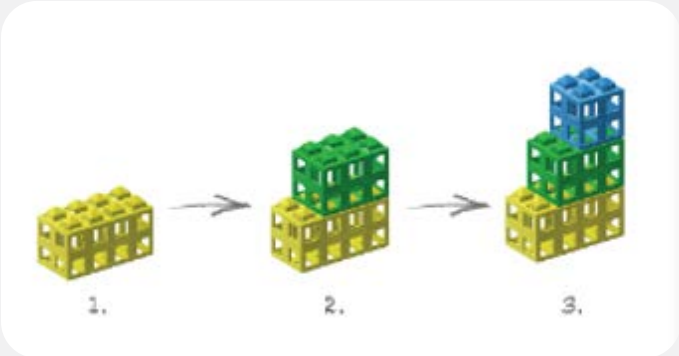


Warm up

Students practice matching objects with pictures.

Teacher demonstrates a sequence of connecting ROK Blocks using blocks and picture cards.

- Ex: 1 yellow, 1 green, 1 blue



Teacher models how to create objects using visuals and ROK Blocks.

- Students create objects with blocks.
- Students identify blocks needed to create the object.
- Students create an object and identify the blocks they used.
- Students create an object and other students identify blocks used.

ADAPTED LESSON CHART: SQUISHY CIRCUITS

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabulary with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-Awareness: students, with practice positive thinking and perseverance – "I can do this." • Social Awareness: students will show respect for property and materials by using them appropriately. • Relationship Skills: students will demonstrate cooperative behaviors with others (listen, encourage, acknowledge opinions, compromise, and reach consensus).	
Physical Environment	• Small group instruction format to introduce Squishy Circuits vocabulary and components. • Small group work – either combine desks or identify space on the floor (tape, furniture barriers). • Materials organized and laid out for students to get when instructed to do so. • Visuals posted and desktop copy available. • Computer projected for step-by-step guide.	

	RECOMMENDATION	REFLECTION
Visual Structures	• All materials are laid out, charged, and working. • Steps for completing the task are written and posted. • Teamwork roles nametags are ready. • Set timer for each step. • Provide group checklist of tasks to be completed.	
Directions	• Gain student attention: all eyes on me. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity. • Teacher roams around classroom to observe groups.	
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete. • What work? Show the student what they will be doing by modeling and providing a visual (worksheet). • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work. • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area).	

	RECOMMENDATION	REFLECTION
Teamwork Roles	• Teacher reviews and/or models each student role involved in the activity. • Teacher, or captain, identify a student to fill each role involved in the activity. • Teacher models where to find the visual and written description of each role's requirements. To ensure every student participates, it is recommended that every student record their ideas on the provided worksheet and share their information with the student in the identified role.	
Classroom Management	Prepare: • Squishy Circuits components available for every student to practice identifying the components. • Ensure every group has the needed number of each component. • Remind students of opportunity to take a break when needed and where they can go for the break • Review expectations for working in a group: voice level, requesting support, obtaining materials, and problem resolution. • Provide Engineering Design Principal worksheet. • Distribute group roles with a reminder of expectations for each role. • The teacher circulates throughout the room checking on each group and provides support.	

ADDITIONAL ACTIVITIES

Reference Materials

Squishy Circuits NGSS curricula and Educator's Guide

https://squishycircuits.com/pages/circuit-basics-quick-start-guide

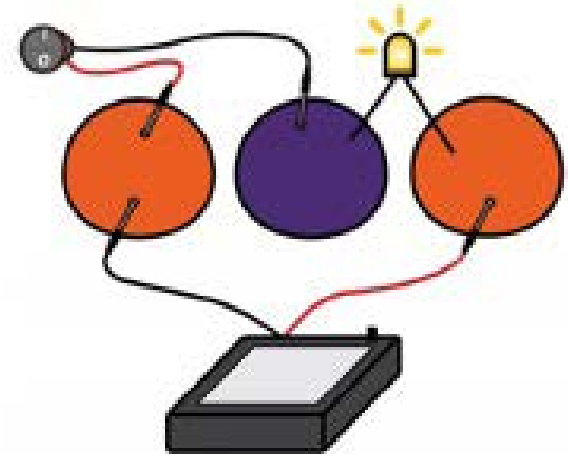
Prior to engaging in creating Squishy Circuits, review/teach background knowledge vocabulary. It may be necessary to demonstrate concepts and use pictures to ensure comprehension. It is recommended that you review background vocabulary as needed for each activity.

Background Knowledge vocabulary (pgs. 5-6 Educator's Guide)

- Buzzer
- Circuit
- Conduct
- Insulator
- LED's 0 light emitting diodes
- Motors
- Parallel circuits
- Schematic
- Series circuits
- Short circuits

Review Squishy Circuits components:

- Battery
- LED lights
- White insulating dough
- Colored conductive dough
- Buzzer
- Sculpting tools and rolling pin
- On/off switch
- Mechanical buzzer
- Motor + fan



Warm-Up/Practice

Students practice matching objects with pictures and practicing vocabulary.

Getting started with your first circuit:

https://squishycircuits.com/pages/circuit-basics-quick-start-guide

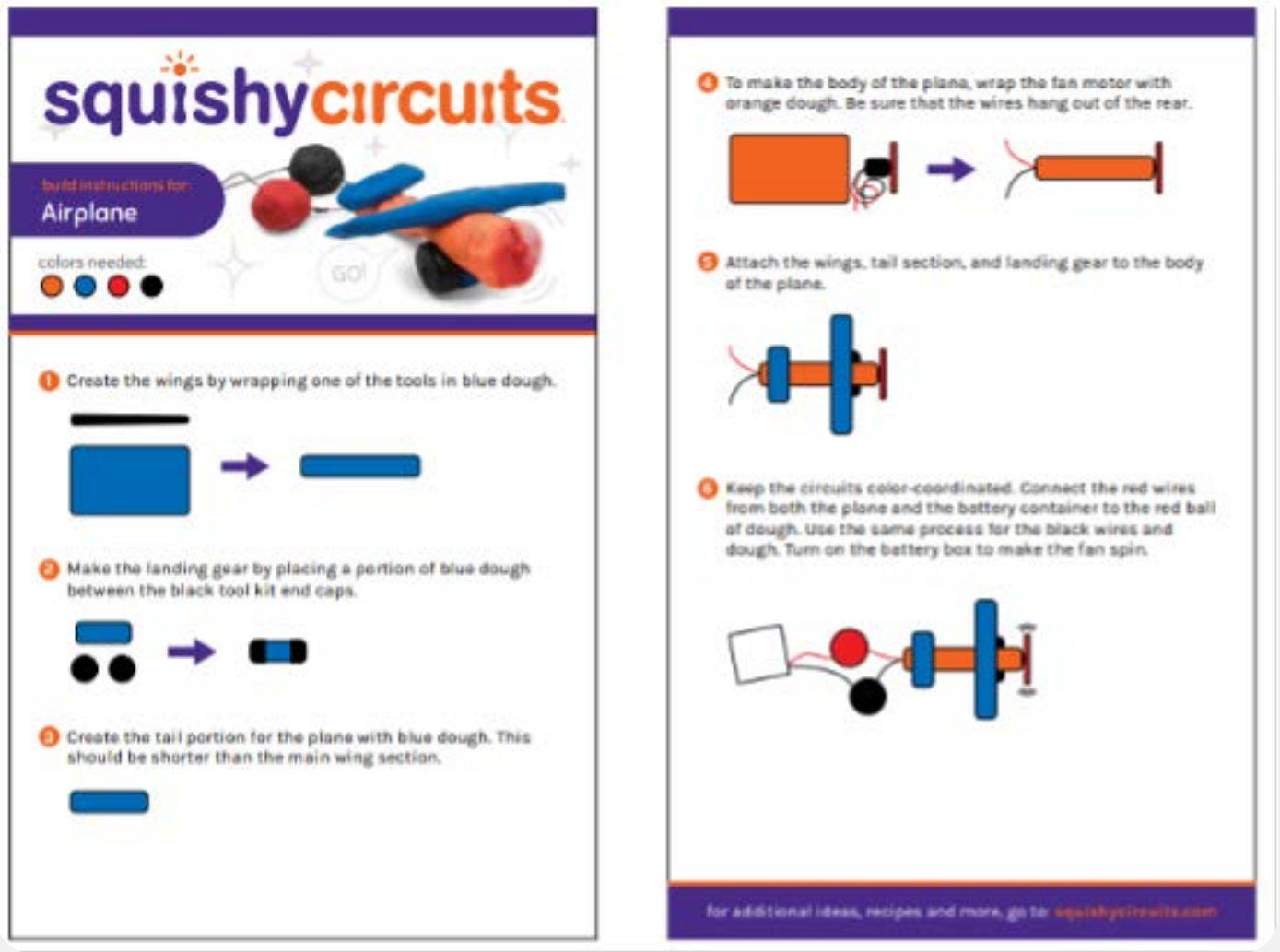
- Display each step and have students complete the task. There are twelve steps. Provide a desk copy for students that require a close, hard copy.

- Visually scan to make sure every student has successfully completed the step before moving on.
- Check for comprehension as you progress through the steps.

Provide additional practice by creating the objects on the Squishy Circuits cards (provided in kit.)

https://cdn.shopify.com/s/files/1/2640/3158/files/21595_SquishyCircuits_AllProjects_becd71fb-2e49-4578-b118-91ede2dbd1e5.pdf?v=1655478787

- It is recommended that a completed model is provided for students to view the final product and to serve as an example.



ADAPTED LESSON CHART: LEGO® CODING EXPRESS

	RECOMMENDATION	REFLECTION
IEP/504 Accommodations and Modifications	• Implement all accommodations and recommendations on IEP or 504 plan. • Pre-teach vocabulary with accompanying pictures. • Provide multiple opportunities to practice. • Review and embed accommodations and modifications checklist.	
Essential Skills Focus	Review/model/role play • Self-awareness: students will be able to take turns. • Self-management: students will seek assistance when needed. • Social Awareness: students will show respect for property and materials by using them appropriately.	
Physical Environment	• Small group instruction format to introduce Squishy Circuits vocabulary and components. • Small group work – either combine desks or identify space on the floor (tape, furniture barriers). • Materials organized and laid out for students to get when instructed to do so. • Visuals posted and desktop copy available. • Computer projected for step-by-step guide.	

	RECOMMENDATION	REFLECTION
Visual Structures	• All materials are laid out. • Visuals are provided with names for each part. • Sequencing cards are used to help students assemble parts. • Teamwork role name tags are ready. • Set timer for each step. • Provide group checklist of tasks to be completed.	
Directions	• Gain student attention: “All eyes on me”. • Provide one step of the directions at a time. • Students repeat directions one step at a time. • Teacher models where to find the visual and written directions for the activity. • Teacher roams around classroom to observe groups	

	RECOMMENDATION	REFLECTION
TEACCH Checklist	• How much work? Identify how long (timer) and how much/many tasks the student will complete. • What work? Show the student what they will be doing by modeling and providing a visual (worksheet). • What is next? Identify what the student will do next: clean up for lunch, go back to your desk... • Where do I place finished work? Identify where the student will place completed work. • What can I do when I am finished? Identify what options are available when the student is finished (read a book, color, put your head down, go to sensory area).	
Teamwork Roles	• Teacher reviews and/or models each student role involved in the activity. • Teacher, or captain, identify a student to fill each role involved in the activity. • Teacher models where to find the visual and written description of each role's requirements. To ensure every student participates, it is recommended that every student record their ideas on the provided worksheet and share their information with the student in the identified role.	

	RECOMMENDATION	REFLECTION
Classroom Management	• Prepare LEGO® Coding Express parts are available for every student to practice identifying the parts. • Ensure every group has the needed number of each part. • Remind students of opportunity to take a break when needed and where they can go for the break. • Review expectations for working in a group: voice level, requesting support, obtaining materials, problem resolution. • Distribute group roles with a reminder of expectations for each role. • The teacher circulates throughout the room checking on each group and provides support.	

ADDITIONAL ACTIVITIES

Reference Materials

LEGO® Coding Express Teacher's Guide

https://le-www-live-s.legocdn.com/sc/media/files/support/preschool/coding%20express/20180221v1_45002_ps_coding-express_teacher-guide-url_video_enus-a30a6dc995e3781ae35a610f9d65aba3.pdf

Vocabulary

- Action brick
- Stop (as a noun)
- Destination
- Train station
- Journey

Name and identify function of materials:

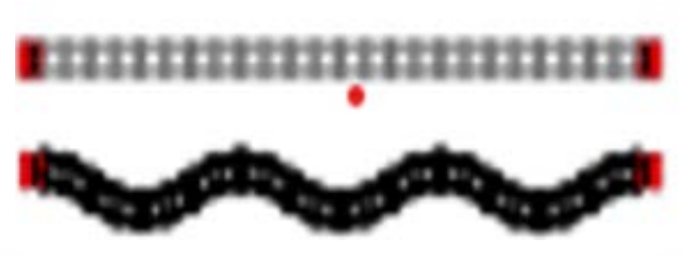
- Engine
- On/off
- Track
- Action bricks
- Building blocks

Warm-Up/Practice

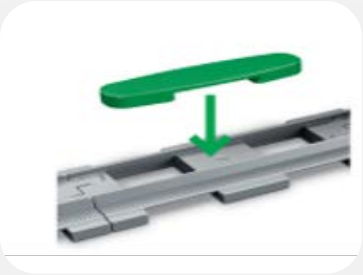
Students practice matching objects with pictures and practicing vocabulary.

Begin by having students build the train following the model provided.

Show students different types of tracks and how they fit together.



Teach action blocks one at a time, beginning with the red one (Stop). Demonstrate how to place an action block into the track.



Demonstrate the many ways to stop the train on the track.

Have students practice building various track shapes and using the action blocks.

It is recommended that a completed model is provided for students to view the final product and serve as an example.