the Young Inventor's Club
by If not you brands?

Educator's Guide
GRADE: THIRD

Dear Educator:

It is never too early to encourage students to become problem-solvers.Understanding how to identify a problem and use their creativity to develop a solution is a life-long skill that can be used in every facet of their lives.

Inventing does just that. Learning about inventions and understanding the process that inventors go through to develop their inventions helps students to become **critical thinkers** and **problem-solvers**. To identify a problem and use their creativity to develop a solution is a life-long skill that can be used in every facet of their lives. Students will ultimately be the ones to "invent" the future. Starting this learning process at a young age will *set them up for success*.

After you complete all of the provided activities review them with your students and break down the different parts of the invention process that they have learned: Observing, problem identification, solution brainstorming, and creating/designing solutions! Want to keep inventing? Coming soon, we are even providing a guide to run an invention fair at your school!

Standards:

Below find overarching Next Generation Science Standards for the unit. In addition, at the end of this guide you will find a chart that shows alignment for each activity with Common Core standards for each activity.

Next Generation Science Standards

3-5-ETS1-1.
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2.
Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3.
Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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Components:

Educator Guide:
This guide will assist you in navigating through the activities, with implementation suggestions and alignment to standards where applicable.

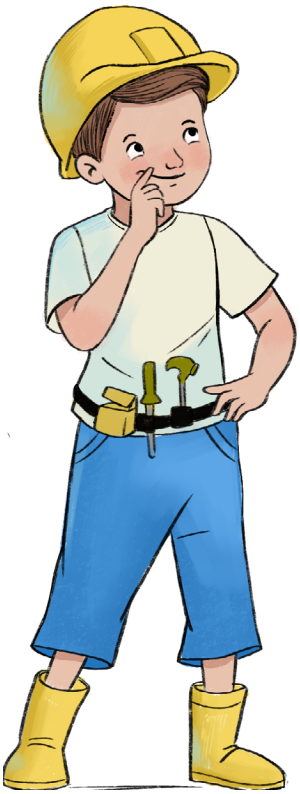
8 Activities:
The 8 activities outlined in this guide are available for download and designed with your kindergartners in mind. They offer challenges that can be done in the classroom or at home.

Young Inventor's Invention Fair:
A great way to end the unit on Invention with an Invention Fair in your classroom, with other classes, or even schoolwide to encourage young inventors everywhere.

How to Use This Program:

We suggest that you review the activities outlined below, download them from your dashboard, and copy as needed. Each activity can be completed in a class period or can be done at home for extended learning.

The activities do not need to be done in the order presented below. You can mix and match to align to your current curriculum. Be sure to read through each activity to be sure you have all of the materials needed before you start.



Overview

The Young Inventor's Club offers a free resource to introduce inventive thinking to children through a series of hands-on, project based activities. With each activity students will use creativity and critical thinking to solve challenges presented. The activities incorporate S.T.E.A.M. lessons and are based on the "If Not You, Then Who" book series.

We encourage you to purchase a set of books with a bonus Inventor's Journal at IfNotYouBooks.com. These books bring the educational lessons and activities to life with engaging stories of young inventors.

Program Objectives:

- Engage students in development of key 21st Century skills including **creativity**, **critical thinking** and **problem solving**
- Introduce the **invention process**
- Support existing **S.T.E.A.M. curriculum** with fun and inspiring content
- Empower students to view problems as opportunities with the **tools to invent solutions**

Have your students join the Young Inventor's Club by going to: **theyounginventorsclub.com**

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Challenge #1: Design A Board Game

Challenge your students to create a board game from scratch.

Inspired by Book 3:
"Let The Games Begin!"

1. Introduce this activity by sharing with your students that inventing requires planning. Inventors need to develop their ideas with drawings to help illustrate what they are creating.
2. Have your students follow the instructions on the activity to design their board game. Through the steps outlined, they will need to plan their design and use their math skills to figure out how players will move from the start to the finish on their board game.
3. If you have the book, "Let The Games Begin" from the "If Not You, Then Who" book series, the students will enjoy hearing about the games that Brooke & Noah invent with their friends.

Challenge #2: Ice Cream Flavor Fun

This activity illustrates how science and marketing work together. Students will learn how to make ice cream in a plastic bag and... invent and market their new flavor.

1. Introduce this activity by discussing how all of your students' favorite things have names. Have them list some of their favorite foods. Then have them think of the brand names for the foods they eat or drink. (examples: Skippy's peanut butter, M & M candy).
2. This activity works best in teams of 2 or 3 students working together. Follow the instructions on the activity to make the ice cream and then come up with the name for their new flavor. Your young students will need adult supervision for this, so you can even do it as a class group. How will they market the name? Have them think of some of the fun ice cream flavor names they know (examples: Moose Tracks, Rocky Road, Chunky Monkey).

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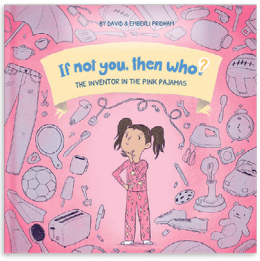
Challenge #3: Coral Reef Shadowbox

Part of being an inventor is observing the world around you. With this challenge, your students will recreate some of the things that are observed under water in a coral reef.



Inspired by Book 1: "The Inventor In The Pink Pajamas"

1. Introduce this activity by talking about Coral Reefs and ecosystems. You can then talk about Jacque Cousteau and how he wanted to observe the sea life under water but needed to find a better way to do it. He invented the aqualung which enabled him and his team to stay under water for a longer time to observe and collect data. You can also share some photos of a coral reef and some of the things that a diver might find in the reef and name the different elements in the ecosystem.
2. Challenge the students to recreate a model of the ecosystem in a shoe box. Follow the instructions in the activity. You can also mention to your students that inventors create models of their inventions. They are called prototypes.

Challenge #4: Make It Better

Inventing involves identifying a problem and finding a solution. Oftentimes, the solution is an improvement on an existing product. In this activity students will come up with improvements on an existing item they use all the time.

1. Introduce this activity by talking about technology that your students use every day. Maybe it is their Chromebook or tablet. Possibly just turning on the light switch in the classroom or doing something on the smartboard. Technology is all around and changing all the time. Most of the technology that they use are improvements on things that were invented many years ago and have evolved through the years. The evolution comes from someone saying, "I bet we can make that work better, faster, or smarter".
2. With this challenge students will pick an item and brainstorm ways to make it better. This is a great activity to do as a team since it involves brainstorming. You can talk about what brainstorming is and be sure that everyone understands that there are no bad ideas. Everyone should be allowed to give their ideas. As a team they will decide which idea they want to use.

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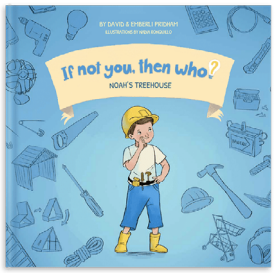
Challenge #5: Build A Bridge

Inventing often involves engineering. When an inventor designs something they have to engineer it to work. This activity will challenge your students to be engineers.



Inspired by Book 2 : "Noah's Treehouse"

1. Introduce this activity by talking about bridges and tall buildings. What types of materials are used to build these structures? What do they think will happen if the materials are not put together right? There are special types of drills and screws that are used to make sure everything is secure. Someone had to invent these items too. Scientists and engineers work together to be sure that the structures are built correctly.
2. With this challenge, the students will be engineers. They have to figure out how to build a bridge so it will hold up when you put something on the top. This is another great activity to do in teams. Students will need to work together to build their bridges.

Challenge #6: Puzzling With Tanagrams

Design is big part of inventing. Looking at shapes and how they fit together helps with design. In this challenge students will put shapes together to form other designs.

1. Introduce this activity by talking about what a Tangram is – a simple set of geometric shapes made up of 5 triangles of different sizes, a square, and a parallelogram. When an inventor comes up with a new idea, they need to think about how they might make it so it works. What will it look like? How will it be built? Often an inventor will build a prototype which is a model of their invention. Cutting out and then putting together the Tangram into different designs will help them gain an understanding of spatial relationships which will help when they create designs for their own inventions.
2. Have students use the Tangram template and the instructions in the activity to create their Tangrams and then create different designs with them.

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Challenge #7: Build a Kaleidoscope

This activity is a fun activity for students to practice following instructions to create something really fun.

1. Introduce this activity by talking about the importance of following directions when they are creating a specific design. They can be creative and make the design their own but they will need to be sure to follow all of the directions so that it works right. As inventors, they will want to document their designs for their prototypes so that someone else could follow the directions to create the same design. Inventors use detailed instructions to file for a patent to protect their ideas.
2. This activity will challenge students to make their own Kaleidoscope by following the instructions in the activity.

Challenge #8: Recycled Flowerpots

Your students have probably already heard Recycle, Reuse, Reduce in reference to helping to preserve our environment. With this activity, they will learn that one person's trash can be another person's treasure. Students will also practice writing down instructions to tell someone else how to care for the flowers in their flowerpot.

Inspired by Book 4 : "We're Going Green!"

1. Introduce this activity by talking about reimagining new uses for discarded items. In an effort to preserve our environment, we need to recycle and reuse rather than discard items. One way to do that is to reimagine or invent a new use. Maybe an old can becomes a pencil holder or a cardboard box becomes a toybox. Ask the students to think of other items they might find new uses for.
2. If you have the "Going Green" book from the "If Not You, Then Who?" book series, the students will love to hear about what Noah invented for his school science fair.
3. With this activity, they will take used plastic bottles and with some assistance from an adult, cut them down and make them into beautiful flowerpots and include instructions to care for the flowers.

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English Language Arts Standards	Design A Board Game	Ice Cream Flavor Fun	Coral Reef Shadow Box	Make It Better	Build A Bridge	Puzzling With Tangrams	Build A Kaleidoscope	Recycled Flowerpots
CCSS.ELA-LITERACY.RL.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.	X	X	X	X	X	X	X	X
CCSS.ELA-LITERACY.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.	X		X		X		X	
CCSS.ELA-LITERACY.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.		X	X		X	X		
CCSS.ELA-LITERACY.RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).	X	X	X		X		X	X
CCSS.ELA-LITERACY.RI.3.8 Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).		X	X			X	X	
CCSS.ELA-LITERACY.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	X	X		X				X

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Mathematical Practice Standards	Design A Board Game	Ice Cream Flavor Fun	Coral Reef Shadow Box	Make It Better	Build A Bridge	Puzzling With Tangrams	Build A Kaleidoscope	Recycled Flowerpots
CCSS.MATH.CONTENT.3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).		X						
CCSS.MATH.CONTENT.3.MD.C.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.	X					X		
CCSS.MATH.CONTENT.3.MD.C.7.A Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	X				X	X		
CCSS.MATH.CONTENT.3.MD.C.7.D Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	X					X		
CCSS.MATH.CONTENT.3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	X				X	X	X	
CCSS.MATH.CONTENT.3.G.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.								X
CCSS.MATH.CONTENT.K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	X		X		X	X		X