

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 NGSS and Common Core standards for each activity.

Next Generation Science Standards

K-2-ETS1-1.

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2.

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3.

Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.



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

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.



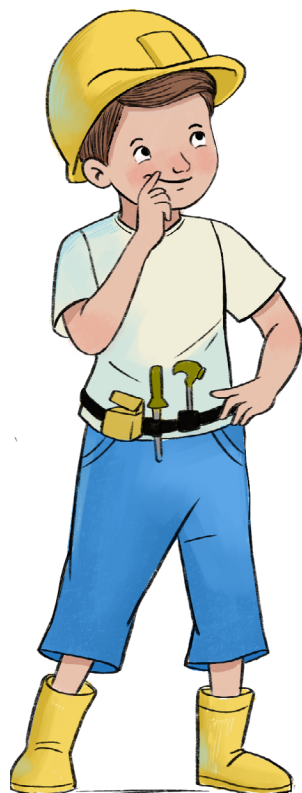
Young Inventor's Invention Fair:

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**

Challenge #1: Styro-Copters In Flight

Challenge your students to follow the instructions provided to make a helicopter out of Styrofoam.

1. Introduce this activity by talking with your students about the invention of the helicopter. Igor Sikorsky invented the helicopter with the first helicopter taking off in Stratford, CT in 1939. Ask students why the helicopter might have been invented – to get people from one place to another faster? What would an inventor need to learn in order to invent a helicopter? You can talk about airflow causing lift and drag.
2. Have your students follow the instructions on the activity to make their own styro-copter and then safely have them drop it from various heights to see how it spins to the ground.
3. You can enhance the activity by having students make the copters in different sizes and adding different size weights and see how it changes the way the copter spins to the ground.

Challenge #2: Paper Plate Marble Maze

This activity incorporates science into invention. Students will learn how to make ice cream in a plastic bag and... invent a new flavor at the same time.

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Challenge #3: Create A Flying Saucer

As with the activity of building a "styro-copter" this activity will also give students a chance to learn about how inventors use science and engineering as they work to solve problems.



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

1. Introduce this activity by talking about common toys that fly such as the Frisbee ®. How does a Frisbee stay in the air? The Frisbee flies due to lift and thrust. The air pressure on the top and the bottom along with the thrust moving the disc forward keeps it in the air.
2. Challenge students to follow the instructions in the activity to create their own flying saucer. They can have fun decorating their saucers to make it their own.

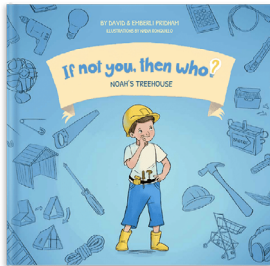
Challenge #4: Make Your Own Kite

In keeping with the flight theme, this activity allows students to be creative with design. They will follow instructions to make their own kites that they will be able to fly with air flow lifting the kite into the air.

1. Introduce this activity by talking about the importance of design to inventors. Inventors work to design their inventions so they are not only functional but also attractive. Have them think of one of their favorite toys. What do they like about it? Does color, shape or size play a part in what makes it special?
2. With this challenge, students will use the instructions to create a simple kite and then decorate it to make their own. Encourage them to be creative and make the design something that represents them. Maybe their initials or name are part of the design or they might use their favorite color. When all the kites are in the air, they want to be able to easily find theirs!

Challenge #5: Straw Towers

Inventing also involves Math. When an inventor designs something often look at shapes (geometry) and use measurements to create the shape and size of their invention. This activity will challenge your students to use math to build their towers.



Inspired by Book 2 :
"Noah's Treehouse"

1. Introduce this activity by talking about skyscrapers and towers. What shapes can they find in a skyscraper? Where do they think the builders might have used measurements to be sure things fit together well?
2. With this challenge, students will use shapes and measurements to build their towers out of straws. They can cut the straws to make the towers stronger. They will need to determine what works best for their towers – squares, rectangles, or maybe triangles. At the end, they can measure to see how high their towers are.

Challenge #6: A Solution-Seeking Mission

Most inventors set out to solve a problem. Observation and listening are good ways to learn what problems people are experiencing might be solved with a new invention or an improvement on an existing product. With this activity students will practice communication and listening skills to learn what their family and friends see as problems that need to be solved.

1. Introduce this activity by talking about interviewing and listening. Discuss with your students how you can learn about people through asking them questions.
2. With this activity, students will ask friends and family questions to learn what problems they have in things they do everyday. They will need to listen and take notes. There are a group of suggested questions, but you can have your students come up with some of their own questions.

Challenge #7: Inventing The Car of The Future

Transportation, whether on land, sea or air is important to our lives. With this activity, students will be challenged to look into the future to envision what transportation by car might be years from now.

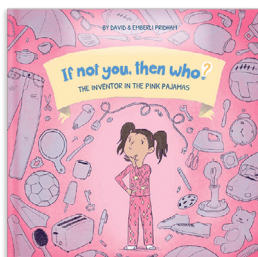


Inspired by Book 4 :
"We're Going Green!"

1. Introduce this activity by discussing transportation and the environment. How are cars changing to help keep our environment clean? What shapes and sizes are there? What types of fuels are used to power cars?
2. With this activity, students will design a concept for the car of the future. What do they think they will be driving when they are grown-ups? Will the car drive itself? Will it be on the ground or in the air? You can have them come up with a name for their new car of the future!

Challenge #8: Game Time!

Inventors are problem-solvers. This activity will encourage students to observe and identify problems in something they enjoy doing and come up with their own solutions.



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

1. Introduce this activity by discussing how inventors solve problems. You can use an example such as the invention of the windshield wiper. It was hard to see the road in front of you while driving in the rain, so Mary Anderson invented the windshield wiper to clean the window while driving.
2. This activity will challenge students to pick a sport or game they enjoy doing and find 2-3 problems that they could solve to make the sport better.

English Language Arts Standards	Styro-Copters In Flight	Paper Plate Marble Maze	Create A Flying Saucer	Make Your Own Kite!	Straw Towers	A Solution-Seeking Mission	Inventing The Car of The Future	Game Time!
CCSS.ELA-LITERACY.L.K.1.D Use sentence-level context as a clue to the meaning of a word or phrase.	X	X	X	X	X	X	X	X
CCSS.ELA-LITERACY.L.1.1.D Use personal, possessive, and indefinite pronouns (e.g., I, me, my; they, them, their, anyone, everything).	X	X	X	X		X	X	X
CCSS.ELA-LITERACY.L.1.1.J Produce and expand complete simple and compound declarative, interrogative, imperative, and exclamatory sentences in response to prompts.						X		X
CCSS.ELA-LITERACY.L.1.5.A Sort words into categories (e.g., colors, clothing) to gain a sense of the concepts the categories represent.						X	X	X
CCSS.ELA-LITERACY.L.1.5.C Identify real-life connections between words and their use (e.g., note places at home that are cozy).	X	X	X	X	X	X	X	X
CCSS.ELA-LITERACY.L.1.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions to signal simple relationships (e.g., because).	X	X	X	X	X	X	X	X

Mathematical Practice Standards	Styro-Copters In Flight	Paper Plate Marble Maze	Create A Flying Saucer	Make Your Own Kite!	Straw Towers	A Solution-Seeking Mission	Inventing The Car of The Future	Game Time!
CCSS.MATH-CONTENT.1.NBT.B.2.C The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).		X			X		X	
CCSS.MATH-CONTENT.1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.		X			X			
CCSS.MATH-CONTENT.K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	X	X	X	X	X		X	
CCSS.MATH-CONTENT.K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.		X	X	X	X			
CCSS.MATH-CONTENT.K.G.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.		X		X	X		X	