

Dear Educator:

Thank you for taking this journey with us. We are passionate about empowering kids to invent the future. Through our books and the Young Inventor's Club we hope to inspire kids to solve real-world problems with innovation and creativity. This guide will enable you to easily add the "If Not You, Then Who?" books and hands-on activities to your current curriculum,

Through the books, your students will follow Brooke, Noah, and Graham as they use their creativity to find new ways to solve problems they encounter. Along the way, your students will learn about various inventions through the years that have changed our lives. In addition, they will learn what patents are and how they protect those inventions. The story of inventing follows the story of the growth of our country.



For each book, there is a lesson plan with hands-on, project-based activities for students to use the new problem-solving skills they have acquired in identifying problems, researching the problem, brainstorming solutions, and inventing a unique new or improved product. They will also learn that inventing involves testing and adapting and improving their product design. It is ok to make mistakes, learn from them and continue to improve your ideas.

We encourage you to sign your students up in the Young Inventor's Club (with parental permission), to allow them to continue their creative adventures and receive more challenges to do at home or at school as they invent the future!

We hope that you and your students will enjoy the books and the lessons and share it with other teachers in your school and district.

Thank you,
David & Emberli Pridham (Authors)

Overview:

If Not You, Then Who? lesson plans engage young students with the basics of inventing through real-world problem-solving. **Through a series of project-based learning activities, they will learn to:**

1. Identify a problem,
2. Brainstorm solutions,
3. Pick the best idea and plan it out,
4. Revisit and refine their idea, and
5. Present their solution.

Program Objective:

- Engage students in development of key 21st Century skills including creativity, critical thinking and problem solving
- Introduce the invention process including basic understanding of patents
- Support existing STEM curriculum with fun and inspiring content
- Empower students to view problems as opportunities with the tools to invent solutions

Components:

- **Educator Guide:** This guide to assist you with implementing in the classroom including alignment to national standards
- **4 Lesson Plans:** One lesson plan that accompanies each of the 4 books
- **Extension Activities:** Suggestions to expand the program
- **ifnotyoubooks.com:** A website with access to the lesson plans and where you can order the *If Not You, Then Who?* books.
- **The Inventor's Journal:** A tool to keep

your students learning and inventing beyond the lesson plans. You can order packages of journals for each student in your class at ifnotyoubooks.com/educator-page.

- **Young Inventor's Club:** A FREE online club for students to join to continue their journey as inventors. As an educator, you can assist them in signing up and they will receive challenges and learn more about inventing at home.

Standards:

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.

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.

How to Use this Program:

We suggest that you review the lessons outlined on the following pages, download the worksheets from the website and copy as needed. Each lesson can be completed in a class period with suggested extensions for additional class periods or homework.

In addition, we hope you will purchase a set of the *If Not You, Then Who?* books for your classroom and use them in conjunction with these lessons, along with an Inventor's Journal for each of your students (special discount available for teacher use).

Finally, encourage your students to join the Young Inventor's Club. It is free and easy to join online. You can assist them or send home the flyer available on the website with simple instructions included for their parents/guardians to sign them up. Students will receive monthly challenges that you can add to your classroom activities, or they can do them at home. They will receive a free printable Inventor's Journal to track their ideas as they invent their future! You can also purchase a package of Inventor's Journals for your class.





LESSON 1: The Inventor in the Pink Pajamas

Time: 30 – 45 minutes

Materials: Student Activity #1

(We also recommend that you have a copy of the book "The Inventor in the Pink Pajamas" to read to the students).

This lesson aligns with the first book in the series and focuses on brainstorming solutions and improving on existing inventions. Students will learn that not every invention is successful on the first try. Inventions often fail but inventors know that they need to keep trying and even successful inventions can be improved upon.

1. **Begin this lesson by talking about some well-known inventions and their inventors.** Here are few to start you off (of course, add in your own if you have some favorite inventions/inventors).



MARY ANDERSON: invented an automatic car window cleaning device controlled from inside the car— the windshield wiper—way back in 1903. And... she didn't even drive but she saw a problem when the streetcar drivers would have to stop and get out to clear snow off their windshield.



FRANK EPPERSON: Some inventions are created by accident like the popsicle (which was first called the Eppsicle after the inventor) which was invented by Frank when he was only 11 years old. He left a glass of lemonade outside with a mixing stick in it overnight and it froze!



LOUIS BRAILLE: invented a system for blind people to read and write named after him, Braille. He was blind as a child and created this system while in school at the age of 15.

(Note: There are several more inventions and inventors highlighted in the book, "The Inventor in the Pink Pajamas".)



2. **You might want to assign students a project to research and learn about one inventor and their invention and write an essay about that inventor.** This is a great way to bring the program into your language arts lessons. You can also have them use their Inventor's Journals to come up with questions to ask online in The Young Inventor's Club about some of these inventors.
3. **Next, discuss how inventors often improve on existing inventions.** Many well-known inventions were started by someone else. For example, Thomas Edison is famous for inventing the electric lightbulb. In truth, he improved on an invention by Humphrey Davy by creating the incandescent lightbulb that could last over 1200 hours and used widely. Although Thomas Edison was granted over 1000 patents, he also had many more inventions that never received a patent. He understood that failure was part of the process.
4. **If you have the book, read "The Inventor in the Pink Pajamas" with the class.**

5. **Distribute Student Activity #2** and go through the instructions with them and then let them work on the activity independently or in groups of 2-3 students.
 - a. Students will pick one activity they do every day (brushing teeth, eating dinner, doing homework, watching TV, etc.).
 - b. They will write down one main tool/device/item they use to perform that activity (toothbrush, fork, plate, pencil, desk, TV etc).
 - c. They will use the activity sheet to look for ways to improve their chosen device.

Encourage them to be Creative!

6. **You might have the students share their ideas with the rest of the class.** Did some of the students pick the same device to improve on? Discuss the different improvement ideas as a class. Will they work?

Extension: Have the class draw out their new improved inventions and put them up around the classroom. Better yet... have them upload them to the Young Inventor's Club!





LESSON 2: Noah's Treehouse

Time: 30 – 45 minutes

Materials: Student Activity #2

(We also recommend that you have a copy of the book "Noah's Treehouse" to read to the students).

This lesson aligns with Noah's Treehouse from the book series and focuses on the importance of making a plan and a prototype for an invention. Students will learn to picture their idea from all angles and determine what materials they will need to create a prototype. They will also learn what a Prototype is.

Procedure:

In the first lesson, your students worked on brainstorming solutions. They learned about inventors and how inventions sometimes fail but you need to keep trying to change and improve your invention. In the book, *Noah's Treehouse*, Noah and his father work on building a treehouse. They develop plans and get supplies and solve problems along the way as they put it together.

1. **Begin by asking your students if they can tell you what a prototype is.** You can explain that with an invention, a prototype is a model of the invention. Discuss what questions you will need to answer in order to build a model:

- What will your invention look like?
- Is it large or small?
- What are the measurements?
- Does it have something that makes it work? Like gears or a motor?
- Who will use it? Kids, Adults, or maybe animals?
- What is it made of? Wood, plastic, metal, fabric? Maybe a combination of materials
- What will you need to build it? Tools, tape, a stapler?



2. **Ask your students if they have every built something?** Maybe they have built something out of Legos. How did they decide what Legos they needed to use to put it together? Did they follow a guide? Did they look at a picture? Did they ever get to a spot where they couldn't find a piece to fit? What did they do to solve the problem?
3. **If you have the book, read "Noah's Treehouse" with the class.** Talk about the various problems Noah and his father had to solve as they built his treehouse.



4. **Distribute Student Activity #3** and go through the instructions with them and then let them work on the activity independently or in groups of 2-3 students.
 - a. Students will pick an object from a list on the activity form.
 - b. They will then draw what it looks like from 4 different angles – top, bottom, left side, and right side
 - c. Next, they will come up with ways they could build a model (prototype) of this item and what materials they would use.
5. **Bring the class together to share what they came up with for building their prototype.** Talk about how with a new invention, they would test their prototype and see if it works. What should they do if it doesn't work? Remember, part of inventing is failing and trying again.
6. **There are lots of activities that the students can use to practice drawing prototypes of their ideas in the Inventor's Journal.** As members of The Young Inventor's Club they will receive challenges each month to practice what they learn.

Extension: You can set up an inventor's corner in the classroom where students can use materials you collect to build prototypes of their inventions.



LESSON 3: Let the Games Begin

Time: 30 – 45 minutes

Materials: Student Activity #3

This lesson aligns with the third book in the series and focuses on observing and identifying problems along with understanding what a patent is and why it is important.

Procedure:

- Begin the lesson by asking your students how they think inventors get their ideas?** Have them look around the classroom and identify various objects: pencils, white board, notebook, stapler, tape dispenser etc. You can write the various objects on the board as they name them.
- Pick one object the students identify and ask them what problem that object solves.** What might the inventor have been trying to fix when they came up with that invention? Were they successful? What improvements could be made to make this invention even better? Have the students discuss their ideas for improving the school tool. Maybe they can make it smaller, or bigger. Could it be made safer?
- Distribute Student Activity #3 and go through the instructions with them and then let them work on the activity independently or in groups of 2-3 students.**
 - Students will write down their favorite sport or game
 - They identify 2 problems they have while playing it. (Example: the sport is soccer and when they practice at home, they keep having to run down the hill to retrieve the ball, and their shoes get muddy, and their mom gets mad).
 - Then they will come up with 2 ways they could fix each of the problems they have identified. (Example: they tie a big rope to the ball and tie the other end to a tree so the ball never goes too far, and they can retrieve it by pulling on the rope, and they put a shallow bucket of water by the door to rinse the mud off their shoes).
 - Encourage them to be creative. Use their imagination!

4. **If you have purchased the If Not You books, read “Let the Games Begin” aloud to the class.** See how Brooke and Noah work together to solve problems they encounter while playing sports/ games.
5. **Explain that inventions are identified with patents.** A patent is a kind of intellectual property. The person who holds it can prevent others from making, using, or selling their invention for a set amount of time. Intellectual property is a “creation of the mind.” Inventions, books, drawings, and brand names are all forms of intellectual property. Any device or discovery that uses a new process, machine, or material can be patented. Improvements to existing devices and discoveries can also be patented.
6. **You can tell them that kids have invented amazing things and received patents for them.** For example, George Nissen was 16 when he invented the Trampoline. He was a gymnast in high school when he came up with the idea. It took him a few years to perfect his invention and he eventually received a patent for his “tumbling device” in 1945 when he was 31.
7. **Have students use the Inventor’s Journals to practice what they have learned at home.**

Extension: A great way to practice observing and identifying problems is to carry a piece of paper or pad around with you for a couple of days and write down observations. For an extension, you can have students write down their observations at home, the grocery store, or any event they go to. What are people doing? What problems are they encountering?

Have them do this for 2 days and then come home and share what they have observed. You can then break the class into groups and have them pick one problem and brainstorm some solutions together.



LESSON 4: We're Going Green

Time: 30 – 45 minutes

Materials: Student Activity #2

(We also recommend that you have a copy of the book "We're Going Green" to read to the students).

This lesson aligns with the "We're Going Green" book in the series and focuses on putting into practice what the students have learned in the last three lessons. Just like Noah in the book, the students will come up with their own invention to help the environment using all of the steps: **1.** Observing and identifying a problem, **2.** Brainstorming solutions, **3.** Picking the best idea and planning it out, **4.** Revisiting and refining their idea, and **5.** Presenting their solution



Procedure:

- 1. Begin this lesson by reviewing what the students have learned so far.** Ask them to help you list out what they know about inventing on the white board. How do they identify a problem? What do they do next?
- 2. Next talk about what "Going Green" means.** What are some of the problems in our environment that need to be solved? Create a list that the students come up with on the white board. You can help them get started with some hints: Do they see garbage around on the streets? Have they heard about plastic in the oceans? Do their parents ask them to turn off the lights when they leave the room?
- 3. If you have the book, read "We're Going Green" with the class.** What do they think about the various projects that the students came up with to help the environment?

Extension: Create an invention fair for your class. Have them create working prototypes and share them in a "Going Green" class fair. Invite the parents/guardians to come view all the inventions.

- 4. Distribute Student Activity #4** and go through the instructions with them and then let them work on the activity independently or in groups of 2-3 students. (We suggest allowing an extra class period for this activity.)
 - Students will select one of the problems identified on the list that you created as a class.
 - They will brainstorm solutions and list them on the activity sheet.
 - They will select one of their ideas to plan out.
 - They will draw out what they think their idea will look like and how it will work and make a list of the materials they will need to build a prototype.
 - They will share their drawings with the class (and we suggest that you upload them into the Young Inventor's Club online!)