



Inventor's Studio

Spark!Lab is a real place located in the Smithsonian's National Museum of American History. It's a hands-on invention activity center where visitors learn that invention is a process and that everyone is inventive.

Activities incorporate history, science, engineering, technology, and art. A visit to Draper Spark!Lab "sparks" imagination and curiosity, and can be the first step to exploring our own inventiveness and invention in the world around us.

To learn more, visit us at: <http://www.invention.si.edu/try/sparklab>



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**Inventor's
 Guide**

WARNING:
 FUNCTIONAL SHARP POINT/EDGE

Did you know that we are surrounded by invention?

Life today is much easier, safer, faster and more convenient thanks to creative problem solving through invention. Since the beginning of time, people have used their imaginations as a way to solve a problem or overcome a challenge...

Your Challenge:

You've always wanted to invent something, but you don't know how to go about it. It seems like an impossible thing to do. Don't worry; we will help you create your first invention. You're given everything you need to create a custom treehouse and other cool inventions. After learning the basics, it's up to you, the inventor, to come up with your next unique invention. Welcome to the wonderful world of inventing!

An Invention...

is defined as "a new device, method, or process developed from study and experimentation..." Lots of inventions have been made over the years, and now it's your turn.

Using the process of invention and the materials given, we will show you how we created the treehouse on the front of the box. Use the remaining supplies to create another invention! What will you create?

To invent
you have to:



THINK IT

Have a great idea for
an invention.



EXPLORE IT

Investigate inventions and
ideas of the past.



SKETCH IT

Draw pictures and diagrams
to figure out how your
invention might work.



CREATE IT

Build a prototype or
model of your idea.



TRY IT

Test your invention.



TWEAK IT

Keep improving your idea.



SELL IT

Market your invention to
people who might buy it.

THINK IT

Write down your ideas for an invention no matter how crazy or weird. Remember ideas can be limitless!

To help you get started, use the Idea Starter. (Instructions for putting the Idea Starter together are on the Helpful Tips page.) Choose a color and roll the die. Write down the word in that color. Continue doing this about 5 times. Using the words you've written down, think of an invention that relates to all or some of the words.

We rolled the words treehouse, colorful, city, high, and music. We chose to focus on these words:

Treehouse
Colorful
Music



EXPLORE IT

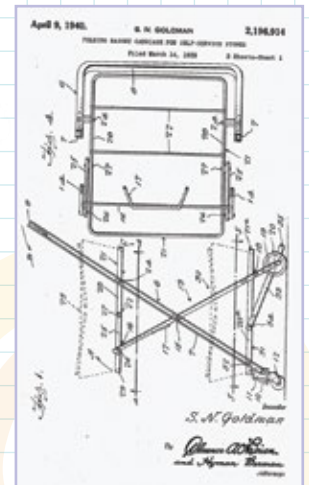
Do some research to see if there are other inventions out there similar to your idea. How can yours be different? Here are some examples to help you get started.



"Eureka!" – the moment your idea takes shape and becomes a new product that changes the world. Where would we be if Thomas Edison had not invented the carbon-filament bulb in 1879?



Imagine shopping for groceries without a cart. Sylvan Goldman designed the shopping cart in 1940. Grocery stores were much smaller back then, so the cart was made to have a foldable frame with a basket above and below.

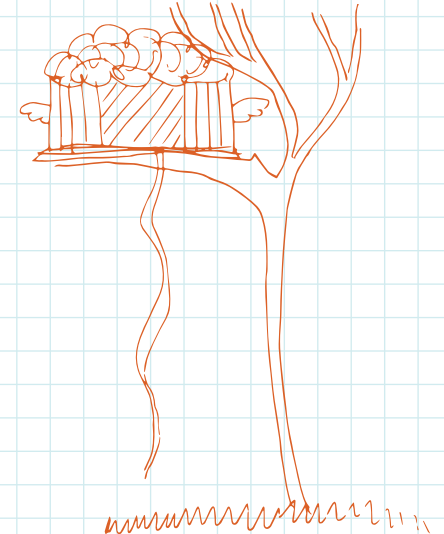
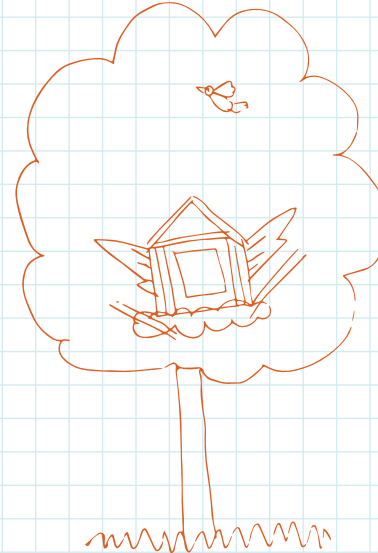
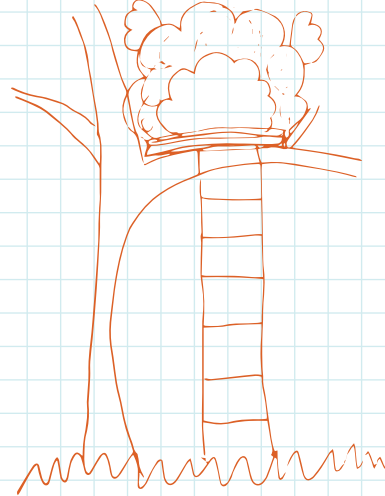
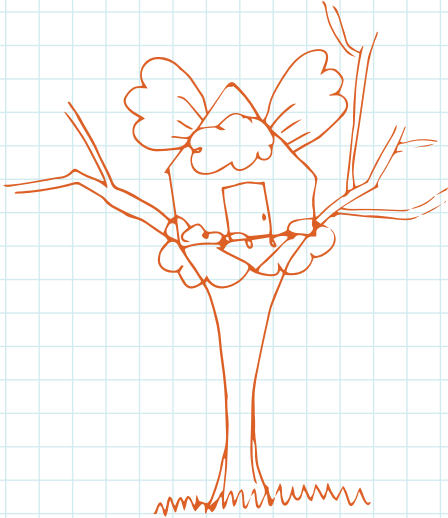


A few years later, Orla Watson improved Goldman's design by making the carts telescoping – fitting one inside another to save space. His carts, dating to 1949, have not changed much from what you see in the grocery stores today.

SKETCH IT

Use the space provided or your notebook to do a few quick sketches of what your invention could look like.

We drew lots and lots of tree houses. The more sketches the better. Here are a few examples.



Lots of drawing = Lots of ideas!

CREATE IT

Start putting your pieces together to build your creation. Utilize the qualities of the contents you've been given.



Here are some of the pieces we used to create a musical treehouse. The small gears were strung onto the treehouse, so when the wind blows they would make sounds. We shaped the clay into music notes then colored them with the markers after the clay dried.

TRY IT

Does your invention work like you thought? If yes, congratulations! If not, think about how you could tweak or improve it.



We decided our treehouse needed a ladder to reach the door, so we moved on to the next step, "Tweak it".

Needs Ladder!

TWEAK IT

How could your invention work better?
Make the changes you need.



We built the ladder, but also tweaked the treehouse by adding a ramp to the base of the ladder.

Add ramp to base

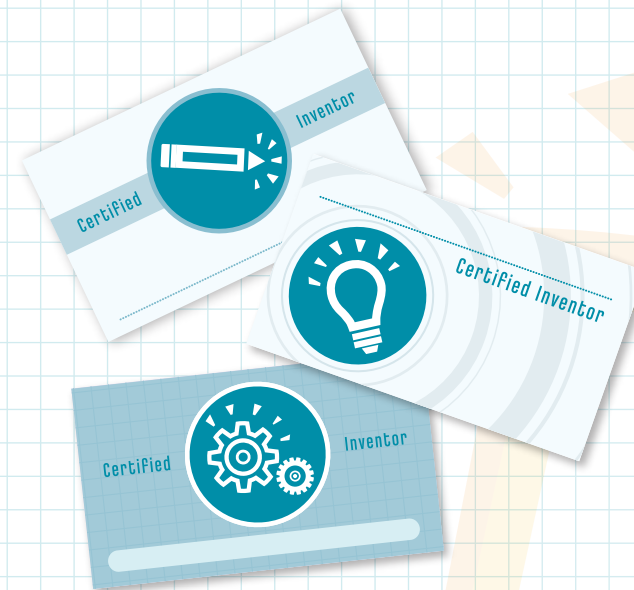


SELL IT

If your invention were going to be sold, how would you package it? How much would it cost? Where would you sell it? What would it be called? Who do you think would buy it?

We imagined that the colorful musical treehouse could be an actual full scale treehouse in someone's yard. If so it would be sold in hardware stores. Or it could also be a small music box that would open from the top and store things. In that case it would be sold in gift shops.

Fill out the business cards with your name and the name of your invention. You can use them when you're ready to sell your idea.



To create the Idea Starter:

- 1.) Fold the shape where scored.
- 2.) Remove the white strips to reveal the adhesive.
- 3.) Line the tabs up to the edges of the shape and press together to adhere. If the shape pops open, use tape to keep it closed.



Helpful Tips:



Use the straws as axles for wheels or to help hold things up.



The foam gears can be used as wheels or to keep things steady.

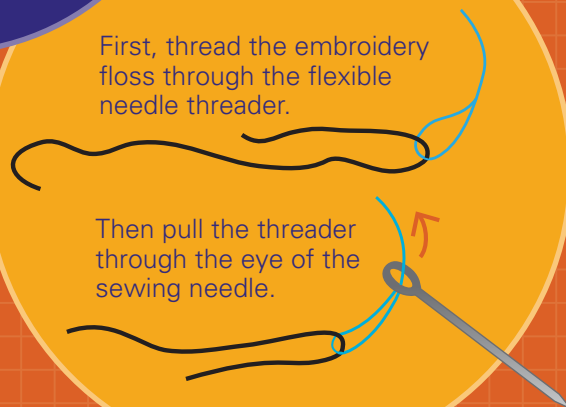
Fluff can be used as a filler or to add interest to your creation.



To use the needle & threader

First, thread the embroidery floss through the flexible needle threader.

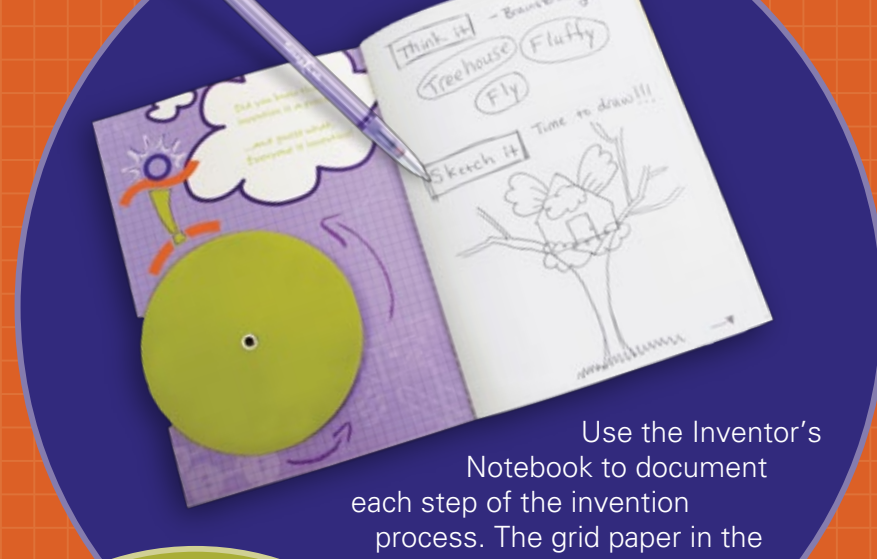
Then pull the threader through the eye of the sewing needle.



Tape, sticky tabs, rubber bands, glue and chenille stems can hold things together.



Sculpt with the air dry clay. Depending on humidity and temperature, the clay may take from 4 - 24 hours to dry completely.



Use the Inventor's Notebook to document each step of the invention process. The grid paper in the back of the book is very helpful for sketching in proportion.



Card stock shapes are available for creating structures or adding character to your design.

Congratulations on becoming an inventor!

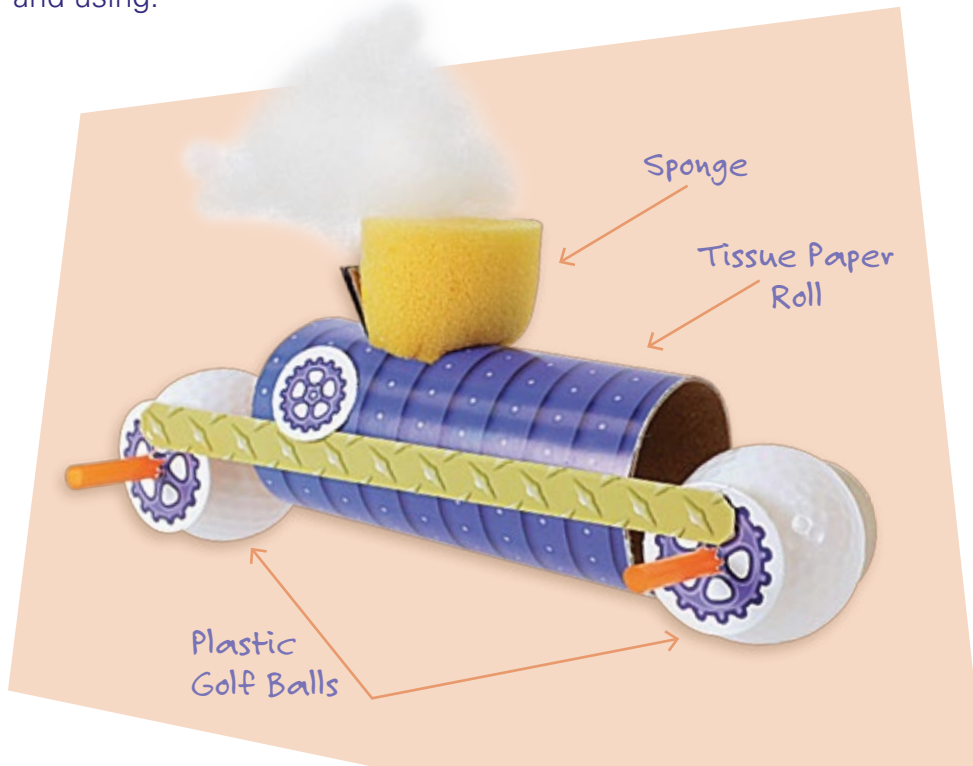
Fill out the patent certificate with your name and date.

A patent is a license that protects your invention from anyone else trying to replicate it.



Project Hack!

Using the box, items found around the house, and the contents in this kit, what more can you invent? Always ask before taking and using.



How you can make a Musical Treehouse!

1

Insert a straw into 2 large foam gears. The gears are the base to hold the straw up. This will act as the "tree".



2

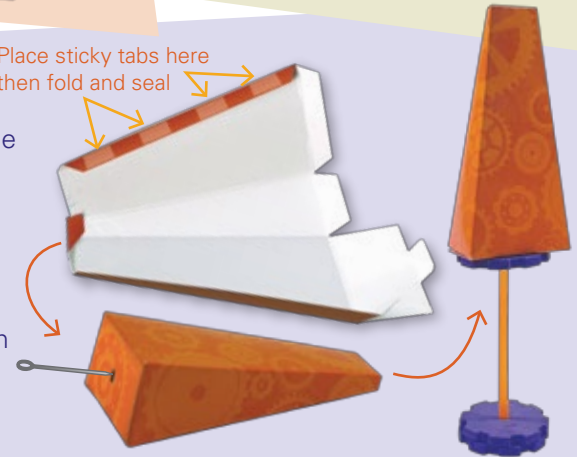
Slide a rubber band about half way down the straw and add another gear. The rubber band will keep the gear from sliding down and hold the treehouse structure in place.



3

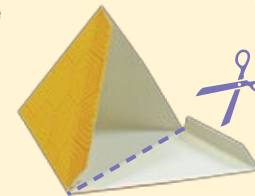
Assemble the orange card stock shape using sticky tabs to keep it together. Use the needle to make a hole in the center of the bottom to slide the shape onto the straw.

Place sticky tabs here then fold and seal



4

Assemble the yellow card stock shape, cutting off one side. This will be the roof.



5

Cut an awning shape out of the card stock and adhere it to the roof. Then use the needle and thread to string on the gears.



6

Adhere the roof to the treehouse. Then build a ladder and ramp with the card stock sticks and the treehouse is complete!

