

# LESSON 6: Intent to Invent

## Lesson Script

**THIS SCRIPT IS TO BE USED AS A GUIDE TO ACCOMPANY THE SLIDE DECK FOR THIS YIP LESSON FOR PRESENTATION IN PERSON OR VIRTUAL (SYNCHRONOUS OR ASYNCHRONOUS-PRE-RECORDED).**

**TEACHER MAY ADD SPECIFIC GREETINGS AND COMMENTS AS NEEDED AND MAKE CHANGES TO MEET CLASS NEEDS USING THE LESSON PLAN IN THE YIP CURRICULUM.**



***[TEACHER MAY MODIFY INTRODUCTION TO LESSON AS NEEDED.]***

Welcome to our sixth session for our invention unit with the Young Inventors' Program.

Today we are going to cover YIP Lesson Six: Intent to Invent.



By the end of this video you will be able to outline a plan for your own inventions and then compile your ideas into a drawing of an initial model. You will also learn how to receive feedback from others on your idea and use this feedback to make changes to your invention to make it better.

# LESSON 6: Intent to Invent

**MATERIALS:**

- Pens/pencils
- Notebook or other paper for writing and drawing
- YIP Inventor's Journal
- Intent to Invent worksheet (2 copies, one copy is in your YIP Inventor's Journal)
- Peer Sharing worksheet



Before we start, you will need the following materials.

- Pens/pencils
- Notebook or other paper for writing and drawing
- YIP Inventor's Journal
- Intent to Invent worksheet (*students may need 2 copies, one for example activity and one to complete for their own invention; copy also found in YIP Inventor's Journal*)
- Peer Sharing worksheet

**IF PRE-RECORDING YOU MAY SAY:**

If you want to pause the video while you collect your things, go ahead and press Pause. Then hit Play when you are ready.

**WHY MUST WE PLAN OUR INVENTIONS?**



Today, we are going to plan and then carry out your invention project so that you can turn your idea into a model, or what inventors call, a prototype.

# LESSON 6: Intent to Invent

## PLANNING AN INVENTION

Invention is a process – there are many steps.

Why should we have a plan?

How do you plan out a project?



We make plans every day and use planners to help us remember what we need to do and when, and to keep us on task. What kind of planners do you and your family use? My family has a calendar of all of our activities and schedules, and I use a planner to help me make a list of things I need to do each day. Planning an invention project is the same. A good plan will include a list of your steps and a timeline to help you complete the steps on time.

### **NOTE:**

***IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND ASK STUDENTS TO SHARE HOW THEY STAY ORGANIZED. SHOW AN EXAMPLE OF A PLANNER OR CALENDAR. BEGIN SLIDES WHEN READY TO RESUME.***

***IF PRE-RECORDING, TEACHER MAY WISH TO STOP SCREEN SHARE AND SLIDES TO SHOW AN EXAMPLE OF A CALENDAR OR PLANNER. ASK STUDENTS TO THINK ABOUT HOW THEY STAY ORGANIZED. BEGIN SCREEN SHARE WITH SLIDES WHEN READY TO RESUME.***

## GUIDED DISCOVERY

### INTENT TO INVENT WORKSHEET

- This form will help you collect all of your ideas in one place.
- You will write about and draw your invention.
- Remember to have an adult sign the form.
- Let's use the pencil as an example.




A good place to start is declaring your Intent to Invent. There is an Intent to Invent page included in your YIP Inventors Journal. We are going to go through this page together and then you can complete your own Intent to Invent in your journal. This page will be an important document when you present your invention or if you ever need to prove that your idea is really yours.

The Intent to Invent form allows you to collect all of your ideas in one place. You can write about and draw your invention to show your idea and your plans. Let's do an example together using the pencil as our invention idea.

### **NOTE:**

***IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND SHOW AN EXAMPLE OF AN INTENT TO INVENT FORM. GO THROUGH THE FORM TOGETHER WITH THE CLASS. ALLOW STUDENTS TO SHARE THEIR THOUGHTS AS THEY WORK. BEGIN SLIDES WHEN READY TO RESUME.***

## LESSON 6: Intent to Invent

**IF PRE-RECORDING TEACHER MAY WISH TO STOP SCREEN SHARE AND SLIDES TO SHOW AN EXAMPLE OF AN INTENT TO INVENT FORM. THEN SHOW THEM A COMPLETED FORM. BEGIN SCREEN SHARE WHEN READY TO RESUME.**

**NOTE:**

**IF READY, STUDENTS SHOULD USE THIS CLASS TIME TO WRITE A DRAFT OF THEIR OWN INTENT TO INVENT FOR THEIR ORIGINAL INVENTION. TEACHER WILL PROMPT AS THEY GO THROUGH EACH PART OF THE FORM AND PROVIDE EXAMPLES, BUT STUDENTS SHOULD WRITE IDEAS AND NOTES RELEVANT TO THEIR INVENTION. THIS DRAFT CAN BE USED IN THE PEER SHARING ACTIVITY LATER IN THE LESSON.**

Use the information below to help you complete the example form:

First, complete the top by entering your name, grade, teacher/mentor name and the date.

Then, describe what you plan to invent? Write it here. So for example, if we were inventing the pencil we might write...I intend to invent...

“a tool for writing or drawing, made of a piece of graphite in a long, narrow, protective casing that keeps it from breaking in the user’s hand.”

Try to be specific in your description. You are explaining a brand new idea that no one knows anything about. They do not have an image or a vision of it in their minds- it is your job to create this for them.

## LESSON 6: Intent to Invent

THE INTENT TO INVENT WORKSHEET

**ORIGINALITY RESEARCH**

The steps I will take to determine that my invention is original...



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Next, let's talk about your original idea and research. How do you know that your idea is original? What are you going to do to prove that you are the first to think of this. For our example, we may write something like...The steps I will take to determine that my invention is original are...

- “1. I will research the need for such a tool by interviewing my family and neighbors.
2. I will explore the internet for similar tools and ideas. I will specifically look at kids.yahoo.com and the US Patent and Trade Office websites.
3. I will look to see if similar tools are already sold by searching Amazon.com.”

THE INTENT TO INVENT WORKSHEET

**MATERIALS**

Materials I will need...



Places I will find those materials...

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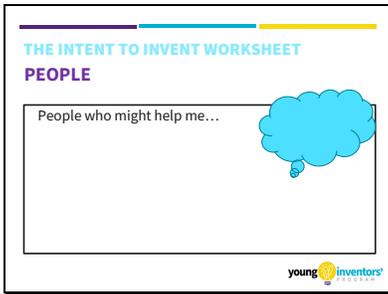
Then, you need to think about the materials you will need to build your model to make your invention. Remember, your model does not have to be a working model or real, but it should show your vision of your invention idea. You will list all materials you use on the Intent to Invent form. And if you are not able to build a working model, for example if your invention is a flying car, you can list what materials you are using to show your idea- these may simply be recycled bottles and cardboard. But then you can also list what materials you would need to make a real flying car such as aluminum, steel, a jet engine, rubber.

If you need to buy any supplies for your invention, you can also list the cost of each item and where you buy it. This part of the form may be added to as you go because you may make changes as your invention evolves.

To build a model of a pencil, I may use a paper towel roll to be the wood casing, and then fill it with black tissue paper to represent the graphite inside the tube, and then maybe some foam to be the eraser and construction paper to make the pointy end. Obviously, this would let me make an enlarged model of the pencil to see all the different components. But, it is still a good model to present. On a separate page, I may list what each

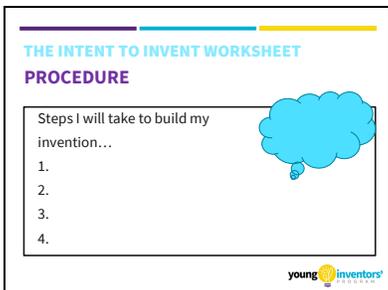
# LESSON 6: Intent to Invent

component of a real pencil would be made of, so for example, I would write that the paper towel roll represents a wooden case, and the tissue paper would be graphite.



People- so who might help you with your project? Maybe someone at home? Maybe someone you know who is an expert in the topic such as a doctor or a coach? If you are building something bigger, maybe you need help in learning how to use a tool like a saw. Perhaps you need to talk to an employee at the home improvement store.

For our example of the pencil, maybe I would write the following: “Talk to Mrs. Smith, the Kindergarten teacher at my school. She has great need for a writing tool, especially one for smaller hands. And I will talk to Mr. Carmon who is a woodworker in my town to tell me more about how to carve wood into a long narrow tube to be a pencil case.”



Your procedure is the main part of your plan. The steps you will take to build your model. Like we did in our S’more activity, you want to be as precise and descriptive as you can and list each single step to build your invention. Think of this as being the directions you would give to someone who can make your idea come to life exactly as you see it in your mind, like a recipe.

So for our example, we may begin like this...The steps I will take to build my invention...

“Step One: The wood is softened and molded into a tube.

Step Two: The tube is split in half lengthwise.

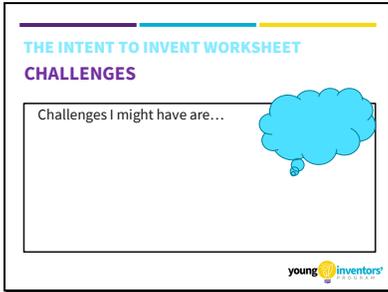
Step Three: A groove is made along the cut side of each half.

Step Four: The grooves are filled with graphite.

And so on...

For your Intent to Invent page, it’s ok if you have to add steps later, because you will probably learn thing along the way and realize you need to do some steps that you didn’t even know about when you began. But, try to be as complete as possible for now.

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Finally, it's always smart to think about possible roadblocks or obstacles you may face as you go. Remember that making mistakes and having things not work out is ok in this process. It actually helps you figure out how to make your invention idea work better. Think about what steps may be most challenging and why so that if something happens, you are prepared and can take care of it before you get frustrated.

For example, one challenge with the pencil might be carving out the inside of the tube without breaking the sidewall. A woodworker may help, or making several tubes in case one breaks could be another strategy so you have backups.

Another challenge might be getting the graphite inside the groove. More research on ways this can be achieved will prepare us for how to approach this step in the process.

And what if the tip keeps breaking? Maybe we think of other materials that we can use instead of the graphite or another way to sharpen the pencil so the tip stays strong.

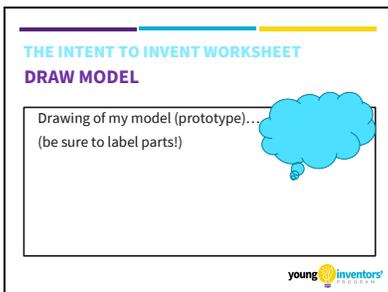
Finally, you will need to draw your design- what you want your invention to look like when it's complete. You may choose to draw it from several angles- looking at it from the side, or from above. You can add more pages to your Intent to Invent sheet and just insert them into your YIP Inventor's Journal if you want more space to draw. A key part of your design drawings will be labeling the parts of your invention. Be sure to label key features- maybe something that moves on the design, or if a component is made of a special material.

For example, our pencil drawing may look like this:

**TEACHER SHOULD SHOW YOUR OWN DRAWING OF A PENCIL WITH LABELED PARTS.**

**NOTE:**

**IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND SHOW AN EXAMPLE OF YOUR OWN DRAWING OF A PENCIL WITH PARTS LABELED. BEGIN SLIDES WHEN READY TO RESUME.**



# LESSON 6: Intent to Invent

**IF PRE-RECORDING, TEACHER MAY WISH TO STOP SCREEN SHARE AND SLIDES TO SHOW AN EXAMPLE OF A DRAWING OF A PENCIL WITH PARTS LABELED. BEGIN SCREEN SHARE WHEN READY TO RESUME.**

**STUDENT PROVING BEHAVIOR ACTIVITY:  
NOW IS A GOOD TIME TO INSERT ONE OF THE RECOMMENDED STUDENT PROVING BEHAVIOR ACTIVITIES FROM LESSON 6 PLAN INTO THE LESSON. STOP SLIDES AND/OR SCREEN SHARE TO LEAD ACTIVITY. BEGIN SLIDES WHEN READY TO RESUME.**

Now, that you have a plan for carrying out your project, it's time to get some feedback on your invention idea. Feedback from others is valuable because it opens your mind to new ways of looking at your problem and your solution. And you may get some new ideas which will only make your invention better.

Find someone else, (a peer, family member, a friend, a neighbor) to share your idea with. Then use the comments they have to think more about your invention project and decide if you want to make any changes.

**NOTE:  
IF PRE-RECORDING, TEACHER MAY MODIFY PEER SHARING ACTIVITY TO BE DONE AT HOME. SUPPORT STUDENTS WITH SPECIFIC INSTRUCTIONS FOR THE ACTIVITY AND FOR HOW THEY MAY USE SOMEONE AT HOME FOR SHARING AND RECIVING FEEDBACK.**



# LESSON 6: Intent to Invent

## INSTRUCTIONS:

1. Chose who will share first.
2. That person will have **3 (uninterrupted) minutes** to talk about their invention plans: the problem they are solving, their design, materials they will use and how this design solves the problem.
3. Next, the partner will have **3 (uninterrupted) minutes** to ask questions, give feedback and offer suggestions for improvement.

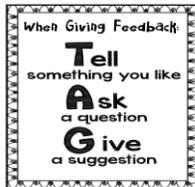
A good way to share your idea is to find someone to talk to. Spend 3 minutes telling them about your idea. They should not ask questions or make any comments during your 3 minutes- this is your time to talk and explain. Then, when your 3 minutes is up, allow your partner to speak. If they have questions, you can answer them. But, if they have ideas or comments, you should just listen to them and write them down. Feedback is a good thing to include in your Inventor's Journal- it is a part of your research.

### **NOTE:**

***IF PRE-RECORDING, TEACHER MAY MODIFY PEER SHARING ACTIVITY TO BE DONE AT HOME. SUPPORT STUDENTS WITH SPECIFIC INSTRUCTIONS FOR THE ACTIVITY AND FOR HOW THEY MAY USE SOMEONE AT HOME FOR SHARING AND RECIVING FEEDBACK.***

## GIVING GOOD FEEDBACK:

### **TAG MODEL**



### **NOTE:**

***TEACHER MAY SELECT THE PREFERRED FEEDBACK MODEL. YIP PROVIDES TWO SUGGESTED MODELS HERE. IT IS RECOMMENDED THAT THE ENTIRE CLASS ONLY USE ONE MODEL. SHARE SLIDES AS RELEVANT.***

If your partner needs some suggestions on how to give feedback, you can follow these models.

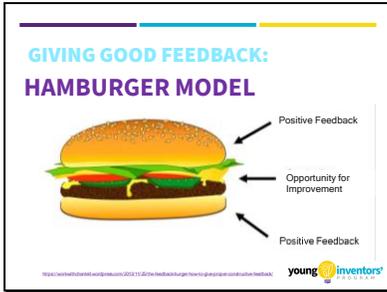
The first suggestion is to use the TAG Model. When giving feedback, they can:

T= tell something they like about the idea

A= ask a question to help them better understand

G= give one suggestion on how to improve the idea

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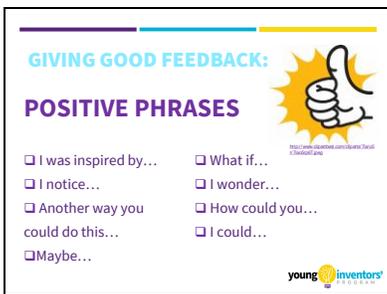


Another method for giving good feedback is the Hamburger Model. In the Hamburger Model, you sandwich the suggestion between two positive comments. For example, if you think about the pencil, you could say:

I like how the invention is easy to hold because it is narrow and long- this is the bottom bun, a positive comment.

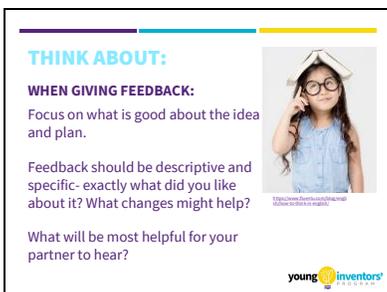
Then, go on to provide a suggestion- maybe you could make the surface of the wood sticky so that it doesn't slip in your hands- this is the hamburger, or the suggestion given.

And, finish it off with another bun, or positive comment- The eraser is a good idea because it allows someone to change something if they make a mistake.



Here are just a few more ideas on how to state things in a positive way as you and your partner are working to share feedback.

Again, if you are at home working independently, you can share these slides with the person you are getting feedback from to help them work with you.



When you are giving feedback, it's good to remember to just focus on one or maybe two things. Even if you have more ideas to share, you don't want to overwhelm the person receiving the feedback. What is the most important suggestion you have. If you are working independently, it's ok to ask your partner to limit their suggestions to just one or two.

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**THINK ABOUT:**

**WHEN RECEIVING FEEDBACK:**  
Listen to the feedback and ideas suggested; do not interrupt.

Be open to all new ideas and to making change.

How can you use feedback to make improvements?



https://www.gettyimages.com/detail/stock-photo/young-girl-wearing-glasses  
Robert Stock/Getty Images



And, of course, if you are the one receiving the feedback, you want to be a good listener. Getting ideas from other people is a learning experience. Be open to new ways of thinking. While you may not decide to use all of the suggestions you get, you should at least consider them as you think more about your invention.

**Today I learned...**

Why it is important to make an invention plan and to have a labeled design to help me build my prototype.  
I also learned how to apply ideas and suggestions to improve my idea and design plan.



**"Design is not just what it looks like and feels like. Design is how it works."**  
Steve Jobs

https://www.pinterest.com/pin/220746388686666



So I've given you lots to do and to think about as you declare your Intent to Invent and formalize your invention plan. Don't forget to write everything in your YIP Inventor's Journal as this is a big part of your process.

***NOTE:***  
***TEACHER MAY CHOOSE TO CLOSE THE LESSON BY GIVING A RELEVANT ASSIGNMENT OR ASKING STUDENTS TO REFLECT ON THE ACTIVITY. SEE THE YIP LESSON 6 PLAN FOR SUGGESTIONS.***