

LESSON 2: Problem Solving

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).

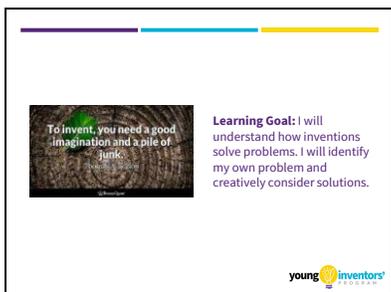
TEACHER MAY ADD SPECIFIC GREETINGS AND COMMENTS AS NEEDED AND MAKE CHANGES TO MEET CLASS NEEDS USING THE LESSON PLAN IN THE YIP CURRICULUM.



[TEACHER MAY MODIFY INTRODUCTION TO LESSON AS NEEDED.]

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

Today we are going to cover YIP Lesson Two: Problem Solving.



By the end of today, you will understand how inventions solve problems and you will be able to use this information to identify your own problem to solve using your creativity, critical thinking and analysis. Then, finally, you will begin to consider possible solutions to your problem as you begin to develop the idea for your very own invention project.

LESSON 2: Problem Solving

MATERIALS:

- Pencil or pen
- Notebook paper
- Problems All Around Me worksheet
- What's Your Problem worksheet
- YIP Inventor's Journal



Before we start, you will need the following materials.

- Pens/pencils
- Notebook or other paper for writing and drawing
- The Crayon Holder worksheet
- Problems All Around Me worksheet (*copy also found in YIP Inventor's Journal*)
- What's Your Problem? worksheet
- YIP Inventor's Journal (*teacher will distribute in this lesson if journal has not yet been given to students*)

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.

Think of some items in our classroom that are inventions?

What problems do they solve?



Think of some of the items that are inventions in our classroom. What problems do they solve? For example, how is the glue stick different from glue bottles or paste? Or how do you think the pencil sharpener idea came up? Someone's pencil was dull and they needed a better way to make it pointy to write again. Remember from lesson one- an invention is a new thing that someone has made to solve a problem or to make an improvement to something that already exists.

NOTE:

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND SHOW AN EXAMPLE OF AN INVENTION FOR STUDENTS TO SEE. ASK STUDENTS FOR RESPONSES TO THE FOLLOWING. BEGIN SLIDES WHEN READY TO RESUME.

- What is this?
- What does this invention do?
- What do we use it for in our classroom?
- What problem does this invention solve?
- What would happen if we did not have this invention?

IF PRE-RECORDING, TEACHER MAY WISH TO STOP SCREEN SHARING THE SLIDE SHOW AND SHOW AN EXAMPLE OF AN INVENTION. ASK STUDENTS TO THINK ABOUT THE ABOVE

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QUESTIONS ON THEIR OWN. BEGIN SCREEN SHARING TO RETURN TO SLIDES WHEN READY.

WATCH:

Invention Convention videos:
<https://youtu.be/fYCO61pJUc>
<https://youtu.be/RLdUdMF2PF8>
<https://youtu.be/pCVkdKXsfI8>

Kid President video:
<https://youtu.be/75okexRzWMk>



Let's watch this video to learn a little bit more about different "new ideas" and how their creators came up with them.

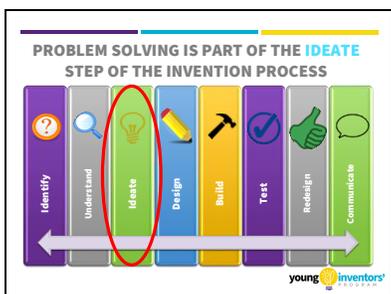
[PLAY VIDEO- SELECT ONE OR MORE]

Links to Invention Convention videos:

- <https://youtu.be/fYCO61pJUc> (4:21)
- <https://youtu.be/RLdUdMF2PF8> (2:29)
- <https://youtu.be/pCVkdKXsfI8> (4:54)

Link to Kid President video:

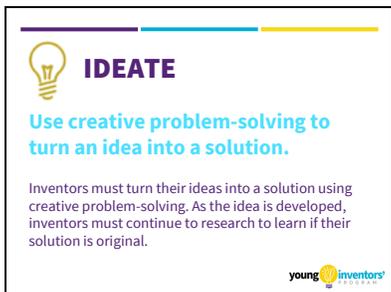
- <https://youtu.be/75okexRzWMk> (4:59)



What great ideas and unique solutions to everyday problems.

Think back to the Steps of the Invention Process that we talked about last time. Problem Solving is part of the IDEATE step- using creative problem-solving to turn an idea into a solution.

LESSON 2: Problem Solving



IDEATE

Use creative problem-solving to turn an idea into a solution.

Inventors must turn their ideas into a solution using creative problem-solving. As the idea is developed, inventors must continue to research to learn if their solution is original.



IDEATE- Use creative problem-solving to turn an idea into a solution.

STUDENT PROVING BEHAVIOR ACTIVITY:

NOW IS A GOOD TIME TO INSERT ONE OF THE RECOMMENDED STUDENT PROVING BEHAVIOR ACTIVITIES FROM LESSON 2 PLAN INTO THE LESSON. STOP SLIDES AND/OR SCREEN SHARE TO LEAD ACTIVITY. BEGIN SLIDES WHEN READY TO RESUME.

NOTE:

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES TO LEAD STUDENT PROVING BEHAVIOR ACTIVITY. BEGIN SLIDES WHEN READY TO RESUME.

IF PRE-RECORDING, TEACHER MAY WISH TO ASK STUDENTS TO PAUSE THE VIDEO WHILE THEY COMPLETE A STUDENT PROVING BEHAVIOR ACTIVITY. WHEN READY, THEY MAY RESUME VIDEO.



GUIDED DISCOVERY:

Look at this item- think to yourself; what is its purpose? What problem does it solve?



It covers the mouth and nose.

It's a mask!

It is re-useable.

It stops germs from spreading.



We're going to go through a problem-solving session together to help you identify a particular problem you want to solve and then help you think creatively about how you can solve this problem in a new way.

Here's a problem many of us are facing everyday: Wearing a mask.

Masks keep us safe, but there are some problems with them too.

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LET'S TALK
The mask solves one problem, but there are problems with the mask too...



Wearing the mask is a problem because...



Take a few minutes to write down a few problems that go along with wearing a mask.

Perhaps wearing a mask is a problem because:
It's hard to breathe when you wear it, especially when you are playing and exercising.
It's hard to drink water or eat when you are wearing a mask.
The mask rubs behind my ears.
The mask slips down off my nose.
I lose my mask all the time.

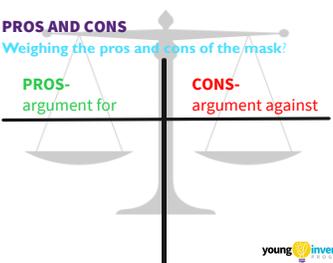
NOTE:

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND ALLOW STUDENTS TO SHARE IDEAS IN A DISCUSSION. BEGIN SLIDES WHEN READY TO RESUME.

IF PRE-RECORDING, TEACHER MAY ASK STUDENTS TO TALK TO SOMEONE AT HOME ABOUT PROBLEMS THEY HAVE WITH WEARING A MASK.

PROS AND CONS
Weighing the pros and cons of the mask?

PROS- argument for	CONS- argument against
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Write down your ideas in a list of Pros and Cons. The Pros are arguments that support the idea. How does a mask help and what about its design or what features make it good? The Cons are the arguments against the idea. What are flaws in the mask and its design?

Take a few minutes to make your list now.

NOTE:

IF IN-PERSON OR SYNCHRONOUS RECORDING, ALLOW STUDENTS 1-2 MINUTES TO THINK AND WRITE BEFORE MOVING AHEAD TO NEXT SLIDE.

IF PRE-RECORDING, TEACHER MAY ASK STUDENTS TO PAUSE THE VIDEO WHILE THEY TAKE 1-2 MINUTES TO THINK AND WRITE. WHEN READY, THEY MAY RESUME THE VIDEO.

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Now, go back to your list. Choose the problem or Con that is most important to you or the one you feel is the biggest concern.

HOW MIGHT I...
What are alternative ways to approach the problem?

Make a list of other solutions or ways to change the mask to improve it.



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Next, think about how you might solve this particular problem. You can start your thinking by leading your question with “How might I...” For example, I don’t like how my mask slips off my face a lot. It just doesn’t fit right on my face and I’ve tried several different designs. So, I ask myself, “How might I make something that will help hold my mask tighter?” What if I used some sort of clip or something to tighten and loosen the string...like a toggle on jacket sleeves or glasses lanyards?

LET'S TALK
For the possible solutions, what are the...



- Advantages
- Limitations
- Unique Aspects

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Once you have a few ideas, then you can think further to narrow down your invention idea into something that will work and be successful at solving the problem. What are some of the advantages to your new idea? What are some of the limitations? And what makes your idea unique? (It must be a new idea to be considered an invention- not something someone else has already done.) How does your idea differ from what is out there? Take some time to think and write down your responses now.

NOTE:

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND ALLOW STUDENTS TO SHARE IDEAS IN A DISCUSSION OR PAUSE AND ALLOW THEM TIME TO THINK AND WORK INDEPENDENTLY.

IF PRE-RECORDING, TEACHER MAY ASK STUDENTS TO PAUSE THE VIDEO AND TAKE TIME TO THINK AND WRITE. WHEN READY, THEY MAY RESUME THE VIDEO.

LESSON 2: Problem Solving



NOTE:

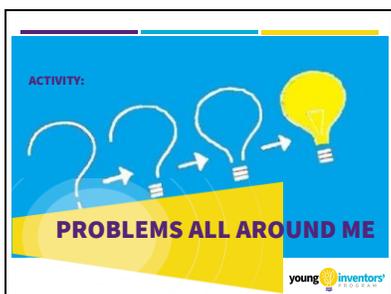
NOW IS A GOOD TIME TO DISTRIBUTE THE YIP INVENTOR'S JOURNAL (OR ALTERNATIVE LOGBOOK) TO STUDENTS. TEACHER MAY USE THE HARD COPY OR DIGITAL VERSION. TAKE TIME TO EXPLAIN TO STUDENTS THAT THE JOURNAL IS A LIVING DOCUMENT THAT SHOULD BE USED EACH TIME THEY WORK ON THEIR PROJECT. IT IS RECOMMENDED THAT TEACHERS EXPLAIN ANY REQUIREMENTS AND EXPECTATIONS FOR HOW STUDENTS WILL USE THE JOURNAL. IT IS IMPORTANT TO TRAIN STUDENTS TO WRITE IN THEIR JOURNALS WHENEVER THEY ARE WORKING ON OR THINKING ABOUT THEIR INVENTIONS.

MORE DETAILS ABOUT THE JOURNAL WILL BE COVERED IN YIP LESSON 4, BUT STUDENTS ARE ENCOURAGED TO USE THE JOURNALS NOW AND MOVING FORWARD AS THEY COMPLETE YIP ACTIVITIES.



So now it's time to make a decision based on your problem solving exercises. Using the information you have gathered by thinking or sharing with others, what is the biggest problem, and what is a solution.

Remember, you do not have to know exactly how you are going to solve the problem right this minute- that comes later. But, what do you think is a good and reasonable solution.



Now it's time to work on your own.

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CHALLENGE: 

What's your problem?
Identify the problem you
want to solve.

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In order to start your own invention process, you must first identify your problem. Yes, there are a lot of problems to solve, but don't let this overwhelm you. This activity will guide you as you begin to brainstorm.

INSTRUCTIONS:

1. Interview one or more people at home (family members, friends, neighbors).
2. Complete the Problems All Around Me worksheet.

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Your job is to interview one or more people at home (family members, neighbors, friends) and complete the Problems All Around Me worksheet.

NOTE:

TEACHER SHOULD DISTRIBUTE WORKSHEET IN CLASS OR USE THE COPY FOUND IN THE YIP INVENTOR'S JOURNAL. IF VIRTUAL, TEACHER SHOULD PROVIDE HARD COPY OR DIGITAL ACCESS TO THE WORKSHEET.

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP SLIDES AND SHOW THE WORKSHEET OR THE YIP INVENTOR'S JOURNAL AS AN EXAMPLE. BEGIN SLIDES WHEN READY TO RESUME.

IF PRE-RECORDING, TEACHER MAY WISH TO STOP SCREEN SHARING AND SHOW THE WORKSHEET OR THE YIP INVENTOR'S JOURNAL AS AN EXAMPLE. WHEN READY, BEGIN SCREEN SHARE WITH SLIDES TO RESEUME.

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THINK ABOUT:

Who will you interview?
What problems do they have in their daily lives?
How do these problems affect them?
What do they wish they could do about these problems?



<https://www.flickr.com/photos/younginventors/14966203180/>

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Before you dive in, think about who you can interview? What questions can you ask them?

- What problems do they face every day?
- How do these problems affect them?
- What do they wish they could do about these problems?

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP THE SLIDES AND DISCUSS THE QUESTIONS ABOVE. BEGIN SLIDES WHEN READY TO RESUME.

INSTRUCTIONS:

3. After completing Problems All Around Me worksheet, chose the 2 problems you'd most like to invent a solution for.
4. Weigh the pros and cons for each.
5. Complete the What's Your Problem? worksheet.

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Once you have finished your interviews and completed the Problems All Around Me worksheet, select 2 problems that you would most like to solve. What is most important to you? Which of these problems do you think is realistic to solve?

Go back to our discussion about Pros and Cons and make a Pros/Cons list for each problem. Weight out the problem. Complete the What's Your Problem worksheet.

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THINK ABOUT:
 What problem is most important to you?
 What are possible solutions to this problem?
 What are the pros and cons?
 Can the solution be successful? Will it work? Can you design it?




After you have finished the What's Your Problem worksheet, see if you can answer these questions to yourself:

- What problem is most important to you?
- What are possible solutions to this problem?
- What are the pros and cons?
- Can the solution be successful? Will it work? Can you design it?

IF IN-PERSON OR SYNCHRONOUS RECORDING, STOP THE SLIDES AND DISCUSS THE QUESTIONS ABOVE. BEGIN SLIDES WHEN READY TO RESUME.

INSTRUCTIONS:
 6. Using your list of Pros and Cons, chose the problem you want to solve.




Finally, using all of the information you have, choose the problem you want to solve. This will become your invention as we move through the Young Inventor's Program over the next few weeks.

TAKE THE YIP CHALLENGE:
 If you are really stuck to come up with a problem, you can focus on an solution around this theme...

BORING CHORING

No one likes chores, but we all have to do them. Design an invention for a labor saving device. How can you make your least favorite chore more exciting, easier, and/or faster to do? Use your innovative spirit to improve the way we all do our chores.



If you feel that coming up with your own problem to solve is blowing your mind or you want a new challenge to think outside-of-the-box, you can focus your energy on solving a problem related to YIP's Challenge Theme. Each year, the Young Inventors' Program offers an additional challenge. Inventors who accept the challenge must incorporate a special element into their invention design.

This year the challenge is: BORING CHORING
 No one likes chores, but we all have them. So we challenge you to create inventions for labor saving devices. How can you make your least favorite chore more exciting, easier, and/or faster to do? Inventions may prevent or minimize the need for the chore

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(an unspillable drink or a pet shedding stopper); automate or simplify the chore (a tool to fold laundry); or make the chore fun (a game or way to play while doing the chore). Use your innovative spirit to improve the way we all do our chores.

Remember that the Challenge is a choice. You can solve a problem you identify on your own, or you can focus on the Boring Choring theme. And, if you chose the challenge, you can direct your interview questions to people at home and the rest of your Problems All Around Me and What's Your Problem worksheets to this theme.

The problem solving process may take you several days as you think about different problems you see around your home or in your community and then to analyze these problems to think of new ideas for how to solve them and how these ideas can be turned into an invention. Don't worry if you can't think of something right away- this is normal. Remember to use your resources. Talk to people around you about problems they have or what inventions they wish were available. Share your thoughts with others too and they may have things to add as you develop your invention ideas.

Well, this ends today YIP Lesson: Problem Solving.

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 2 PLAN FOR SUGGESTIONS.

