



TEACHER DIRECTED ADAPTATIONS FOR VIRTUAL CONSIDERATION

LESSON 2: Problem Solving

LESSON OVERVIEW

In this lesson, students will understand how inventions solve problems and use this information to identify their own problems. They will apply creative approaches, critical thinking and analysis to develop solutions to solve these problems.

OBJECTIVE

Students will be able to combine techniques of creative and critical thinking to approach problems and consider possible solutions.

MATERIALS

Resources Provided by Teacher:

- Slide Deck: Problem Solving
- Videos: Invention Convention videos
 - <https://youtu.be/fYCOF61pJUc> (4:21)
 - <https://youtu.be/RLdUdMF2PF8> (2:29)
 - <https://youtu.be/pCVkdKXsf18> (4:54)
- Kid President
 - <https://youtu.be/75okexRzWMk> (4:59)
- PDF: The Crayon Holder
- PDF: Problems All Around Me (*copy also found in YIP Inventor's Journal*)
- PDF: What's Your Problem?

Materials from Home:

- Pens/pencils
- Notebook or other paper for writing and drawing

VIRTUAL CONSIDERATIONS

Teacher may lead the following lesson plan with flexibility to adapt as needed to fit technology and class format:

Instruction: Problem Solving

1. Share Slide Deck: Problem Solving
Teacher will review the definitions of invention with the class and show students an example of an invention. (Teacher may choose to use the example from the slides or develop their own.)
Ask students the following questions:

- 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?

2. Share videos of examples of student inventions. Suggested videos (Teacher may choose to show some or all videos)

Invention Convention videos

<https://youtu.be/fYCO61pJUc> (4:21)

<https://youtu.be/RLdUdMF2PF8> (2:29)

<https://youtu.be/pCVkdKXsfI8> (4:54)

Kid President

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

OR

Ask students to read story of Cassidy Goldstein, inventor of the Crayon Holder. (See PDF: The Crayon Holder)

3. Teacher will use the slide deck to lead students through a group problem solving session. Teacher will explain that this is the “ideate” step in the Invention Process. This process will help students identify a particular problem and then begin to think creatively about how they can solve it in a new way.

- Teacher will introduce the group problem: Wearing a Mask
- Ask students to make a list of what problems are associated with wearing a mask. Perhaps wearing a mask is a problem because: (allow students to share.) Use virtual format of choice to share responses so that students can collaborate. Then, ask students to decide which of the listed reasons is most important to them in solving the problem.
- Then, ask students to think about how they may approach the issue they have selected as most important in the previous step. Lead with “How might I…” Ask students to think about alternative ways to approach the problem and write a list or share aloud their possible solutions.
- Ask students to look at the possible solutions and examine them to determine for each:
 - Advantages
 - Limitations
 - Unique Aspects
 As a group, select the solution that seems most promising.
- Finally, ask students to make a list of people and things that would help them in carrying out this solution and a list of those who may make the task more difficult. How might they implement their idea?

Ideas for Virtual Instruction:

1. Ask students walk around their house and select 3 inventions that they see and the possible problems these inventions solved.
2. Ask students to craft their own definition of “invention”. They may share their ideas in a class blog or other virtual format to allow for peer to peer interaction and discussion.
3. Ask students to write about what makes something an invention.

Activity: Problems All Around Me

This activity is already set-up to be done at home by the student or it may be modified to be done virtually as a class, in pairs or in small groups.

1. Teacher will assign students to interview one or more people at home (family members, friends and/or neighbors) to complete the PDF: Problems All Around Me worksheet. *(Note: This worksheet is also found in the YIP Inventor’s Journal, so students may complete it directly in their journals).* Students may submit their worksheets by taking a photo of it, scanning it, or using the virtual YIP Inventor’s Journal.
2. Then, ask students to complete the PDF: What’s Your Problem? worksheet to select the problem they feel is most important to them and identify possible solutions to this problem.
3. Finally, students will choose the problem they wish to solve. Students may submit their decisions in the format of the teacher’s choice.

Ideas for Virtual Instruction:

1. Create a sharing space for students to share their possible problems to solve and to work together to narrow down ideas and possible solutions.
2. Host a Teacher “office hours” for students to meet with teacher to discuss their ideas and how they may create an invention project to solve their identified problem.

CHECK FOR UNDERSTANDING

Teacher may wish to do one of the following to check for understanding:

1. In the format of the teacher’s choice, ask students to choose their favorite inventions and explain what problems they solve and why they like them.
2. In the format of the teacher’s choice, ask students to draw a sketch of their new and improved mask design and explain their design to someone at home.