

TEACHER DIRECTED LESSON PLAN

LESSON 6: Intent to Invent

LESSON OVERVIEW

In this lesson, students will begin to plan for their inventions. Students will collect their ideas about their inventions and record them on the Intent to Invent Worksheet. Students will also draw the initial model of their invention, thinking about materials and parts as well as problems they may encounter along the way. Inventors will then share their plans with others and evaluate the feedback they receive and decide how it will impact their design or decide to disregard the feedback.

OBJECTIVE

Students will be able to outline a plan for their own inventions and then compile their ideas into a drawing of an initial model. Students will be able to view the invention ideas of their peers and will learn how to provide feedback, as well as how to receive feedback from others. Students will understand how to evaluate feedback and make decisions about if and how to use this feedback to make changes to their invention designs and plans.

MATERIALS

Resources For the Teacher:

- Slide Deck: Intent to Invent (*optional*)
- Script: Intent to Invent (*accompanies slide deck, optional*)
- Worksheet: Intent to Invent (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*)
- Worksheet: Partner Sharing (*optional*)
- Large Sticky Notes or white board space for Big Paper Practice (*optional*)
- Markers for Big Paper Practice (*optional*)

Materials Sor Students:

- Pens/pencils
- Notebook or other paper for writing and drawing
- YIP Inventor's Journal (or other logbook)
- Intent to Invent worksheet (students may need 2 copies; *copy also found in YIP Inventor's Journal*)
- Partner Sharing worksheet(*optional*)

INSTRUCTION & ACTIVITIES

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

Note: Teacher may choose to use a digital format for an Invention Log in place of or along with the YIP Inventor's Journal. Logbooks of some kind are required for submission to the Northern New England Invention Convention and the Invention Convention US Nationals.

Teacher Instruction:

1. *Teacher may use slides and script to explain the purpose and process of completing an Intent to Invent statement or lead instruction and discussion on their own.*

Teacher will share Slide Deck: Intent to Invent with the class as needed.

Teacher will explain to students how to plan to execute their invention project to turn their idea into a model/prototype.

Note: Slides include effective models for giving constructive feedback to help students provide useful, positive comments during a peer sharing session. Teacher may discuss these now or when they lead the Partner Sharing activity later in the lesson.

2. Teacher may choose to distribute a copy of the Intent to Invent worksheet to students for practice. Teacher will lead students through an example of how to complete it. This worksheet will help students organize their ideas and their plans for completing their invention project. Teacher may use the pencil as an example of the invention idea (as shown in the slides). After each prompt in the slide deck, ask students how they may approach responding to the prompt in a class discussion. Teacher may choose to do the Student Proving Behavior activity as a practice to help students better understand how to complete the Intent to Invent form as their model or as a second practice opportunity.

Student Proving Behaviors:

Recommendations for In-Class Learning activity:

1. Big Paper Practice- Allow students to practice making an Intent to Invent statement. Assign another simple and familiar object such as a paper straw, folder, or ice cream cone for the class to use as an example. Divide the group into 4 groups. Ask each group to focus on one prompt on the Intent to Invent worksheet:
 - a. I intend to invent
 - b. The problem it will solve is
 - c. I have determined to the best of my ability that my invention is original by taking these steps
 - d. I will use the following materials in my invention

Allow students time to discuss as a group and write down their response on the large sticky note. When finished, post the responses in order on the wall for students to see. Then, lead sharing session where each group is given an opportunity to explain their response and the rest of the class may add more or provide feedback.

Ideas for Virtual Instruction:

1. Teacher may use a screen sharing tool or smart board tool to complete an example Intent to Invent worksheet together as a class.
2. Teacher may divide class into smaller groups to go through the Intent to Invent worksheet using the pencil as their invention example using Zoom breakout rooms, Google Classroom, or other format.
3. Ask students to submit their responses in a virtual sharing platform so that they may see the ideas submitted by their peers and provide comments.
4. Ask students to complete and submit the example worksheet using the pencil as their invention idea as a practice before completing their own Intent to Invent Worksheet with their own invention idea.

Activity: Partner Sharing

Teacher may choose to do this activity as a whole class or divide the class into pairs or small groups.

Students will need: Pen or pencil, YIP Inventor's Journal or notebook paper.

1. Teacher will ask students to spend time as a class, with a partner, or in a small group, to talk about their inventions and to give each other feedback on their invention ideas and plans.
2. Each student in the group will have 3 minutes (uninterrupted) to share their invention ideas and plans. Then, their peers will have 3 minutes (uninterrupted) to give constructive feedback and suggestions for improvement or consideration. Teacher may choose to distribute the Partner Sharing worksheet as a guide.
3. Teacher may discuss effective models for giving constructive feedback to help students provide useful, positive comments during a peer sharing session. Models include the TAG model: **T**ell something you like about it, **A**sk a question about it, **G**ive a suggestion to improve it; or the Hamburger Model: **Top bun** is a positive comment about it; **Hamburger** is the feedback that will be useful to help improve it; **Bottom bun** is another positive comment about it.

Ideas for Virtual Instruction:

1. Ask students to share their invention idea and plans with someone at home and then ask for feedback.
2. Teacher may hold individual meetings with students to review invention ideas and plans and to provide feedback.
3. Teacher may host an "Office Hours" to allow students to check-in, share their invention plans and ideas with peers and with the teacher and to receive feedback.
4. Ask students to post their invention ideas and plans to a class blog, or other virtual sharing platform to allow classmates to view ideas and write comments and suggestions to each other.

Assignment: Intent to Invent

This activity may be completed in class in pairs or small groups or at home as a take home assignment.

1. Following the activity, the teacher will ask the students to complete the Intent to Invent worksheet in class or at home for their own original invention idea. Teacher should require students to submit the completed worksheet for their YIP Inventor's Journal (hardcopy or digital). Students can find a copy of this worksheet in the YIP Inventor's Journal and write their ideas directly onto this page or use the worksheet as a draft and re-copy into the journal later.

Note: The Intent to Invent worksheet is an important component of the YIP Inventor's Journal (or alternative Invention Logbook) required for both the Northern New England Regional Invention Convention and Invention Convention US National competitions.

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 write about why it is important to talk to people about their inventions. How did the peer review process help/affect them?
2. In the format of the teacher's choice, ask students to draw a sketch of their invention idea and to label one feature of the design that came from a suggestion or consideration offered in feedback from another person (teacher, peer, someone at home).