

2018 Youth Energy Conference

Elementary Challenge Teacher Instructions: Energy Inventors' Fair

Objectives

- Students will work in small groups to develop a product that helps solve an energy problem they see in the world around them.
- Groups will create a tri-fold board or digital presentation about their product.
- Groups will create a physical prototype model out of random craft supplies.
- Students will present about their product to other students, parents, and teachers as they visit the Energy Inventors' Fair.

Materials

- Craft supplies and other maker space materials
- Tri-fold boards and/or computer access
- Demonstration videos
- Student challenge handout

✓ Part 1 - Setting the Stage

Prepare students for the challenge of inventions and innovations, show the class a short video or set of video clips. There are many great long and short videos on inventors and interesting innovations and the thought process that lead to them. Anything that gets students excited and engaged in the fun of experimenting will do. NEED shared the following:

- From Poop to Profits: <https://youtu.be/z000GdeUB6Q> ;
- How to be an Inventor! Kid President: <https://youtu.be/75okexRzWMk> .

✓ Part 2 – Groups, Assemble!

Place students into groups. If you like, you can pre-determine groupings to promote productivity and creativity. Conversely, you may use a fun activity to group your students randomly. Download Energy Games and Icebreakers from www.need.org, and play Energy Pantomime, or place numbers inside inflated balloons and have students pop them to find their teammates with the same numbers.

✓ Part 3 - Brainstorming Session

1. With students in their groups, encourage them to begin to generate their own innovative ideas that they might turn into inventions. The brainstorming process can be done as a group quickly, but if time allows, the process can be broken down into segments to really encourage individual ideas and team thinking. Students may use the student handout to record their thoughts.
2. Ask the class as a whole to create a list of energy problems.
3. Start the "Speed Generation" round, and ask students as individuals to write down as many inventions as they can come up with to solve energy problems in 2 minutes.
4. Encourage discussion. After the two minutes are up, ask students to turn to one member in their group and compare ideas on their lists.
 - Did you come up with any similar ideas? Circle those ideas.
 - Pick your favorite 5 ideas between you and your partner.
5. Ask students to work again as a group to narrow their focus.
 - In your group, look at the top ideas from each pair. Are there any that are the same?
 - Pick your top 3 ideas as a group.

6. Test it out! Give students 9 minutes, or 3 minutes per idea, to test out and begin planning for each of their top three.
7. Now it's time to select! Ask students to select a final option based on their field testing time. This will be their invention they will work on for the fair.

✓ Part 4 – Plan It Out!

Ask students to begin planning for their invention. Inventors always ask themselves questions as they work through their process. Ask students to answer the questions below on their student sheet:

- What is your invention?
- What problem does your invention solve?
- Who will use your invention?
- How will we share our invention with others? Draw an advertising poster about your invention.
- How will we build this invention? Draw a diagram of your invention. Label the important pieces of your invention.

✓ Part 5 – Build and Prepare!

Gather supplies and allow students to build their invention based on their designs. Students will also prepare a display board or digital presentation to showcase their invention. Give students time to assemble and practice their presentations. You may also decide to ask students to appoint roles within their group so that building/construction and presentation pieces are completed simultaneously.

✓ Part 6 - Inventor's Fair

Round up parents, other students, and staff to come check out student work and listen to presentations. Presentations can be set up in a science fair format, or in any presentation format you desire. Prizes may be awarded, but it is important to recognize something innovative or noteworthy within each group.