

2018 Youth Energy Conference

Senior Challenge Teacher Instructions: Energy Shark Tank

Objectives

- Students will research an emerging energy technology and be able to describe its operation, audience, limitations, cost, and value.
- Students will prepare a pilot project plan for launching the product.
- Students will create a Shark Tank style pitch to share their product with others.

Materials

- Computer access
- Pre-selected list of emerging energy technology projects in research or production phase (see examples below)
- Video clips of sample pitches
- Student worksheet
- Maker space supplies
- Energy bucks (optional)

Part 1 - Setting the Stage & Perfecting a Pitch

Explain the challenge objectives to students and discuss the parameters listed on the student sheet. Prepare students for the challenge of pitching a product by showing the class a set of Shak Tank clips. There are many great long and short videos available. Anything that gets students excited and engaged in the fun of experimenting and pitching a product will do. Discuss the video clips and have students identify as a class the characteristics of each pitch that might make them successful. Take care to note important things students might miss: time, humor, anecdotes, samples, etc.

NEED shared the following:

- Winning Shark Tank Pitches - https://youtu.be/k3PY_p_M-8w
- Mission Belt - <https://youtu.be/hHDwolgmU7E>

Part 2 – Groups, Assemble!

Place students into groups and assign them their products to pitch. To promote productivity and creative teamwork, you may choose to pre-determine groupings or select them randomly. Groups can select their own products if you choose, or you can have them develop a pitch for a product they are assigned at random. NEED used an icebreaker activity to group students, and then newly assembled groups competed in a quickfire STEM challenge to win the right of first selection. 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. Check out Excellent Energy Engineering for examples of quick energy and STEM challenges for a competition in which the winning team selects a product first.

Part 3 - Research Your Product

- Use the student worksheet to help the teams get started with their research. Explain that they will use articles provided and additional research to gather important information they'll include in their pitch, and businesses would need to include in their business plans. Explain that all students will need to be familiar with the research responses, as the sharks may pepper them with questions, and they should each be prepared to answer about all facets of their product and the proposed plan. They will answer questions 1-5, and 7-9 on their student worksheets.
- Discuss valuation of the business. Show the student page outlining this process and use shark tank clips to assist in instructing on the concept. NEED based this portion of the activity on a curriculum entitled Business Valuation for Sharks, by Clark Creative Education (Teachers Pay Teachers). Make sure to explain and review the thoughts to Keep in Mind, as they are important to team success in the Shark Tank.

✓ Part 4 – Promotion and Planning

Groups will utilize their research to create a promotional campaign for their product. (Video, print ads, web/social media ads, etc.). Explain to groups that they should think about where their ads might have the most impact based on their audience. Groups should also develop a pilot project plan for launching. Students will complete number 6 and number 10 on their student worksheet. Ask students to make a prototypical model or rendering of their product if time allows.

✓ Part 5 – Pitch Perfection

Have students assemble their pitches and practice giving their pitch. Advise students that they may make their pitch inclusive of digital media, but their digital media must not be in place of a pitch. Teams will have 3 minutes total to pitch, and an additional 2 minutes for questions and offers from the “Sharks” Assemble a group of parents, administrators, and/or community members to act as the “Sharks” who will receive pitches and make offers. You may provide them with fake money, Energy Bucks, if you desire, or large fake checks for making offers. Ask the Sharks and students to vote on their favorite pitch at the end of the show.

Sample Technology & Products

- **Solar Textiles/Energy Harvesting Fabric**
 - ◊ <https://pubs.acs.org/doi/abs/10.1021/acsnano.6b05293>
 - ◊ <https://www.smithsonianmag.com/innovation/chemist-designer-team-up-to-weave-solar-panels-into-fabric-180960431/>
- **Pee Powered Toilets**
 - ◊ <https://www.forbes.com/sites/lauriewinkless/2016/04/12/powered-by-pee-how-your-toilet-could-fuel-the-future/?toURL=https://www.forbes.com/sites/lauriewinkless/2016/04/12/powered-by-pee-how-your-toilet-could-fuel-the-future&refURL=&referrer=#377ec19b69b8>
 - ◊ <http://info.uwe.ac.uk/news/uwenews/news.aspx?id=3050>
 - ◊ <https://phys.org/news/2016-07-urinal-electricity-urine.html>
- **Transparent Solar Cells**
 - ◊ <https://msutoday.msu.edu/news/2017/transparent-solar-technology-represents-wave-of-the-future/>
 - ◊ <http://energy.mit.edu/news/transparent-solar-cells/>
- **Smart windows**
 - ◊ <https://news.stanford.edu/2017/08/10/smart-windows-darken-lighten-fast/>
 - ◊ <https://www.explainthatstuff.com/electrochromic-windows.html>
 - ◊ https://cordis.europa.eu/news/rcn/124435_en.html
- **Tires that generate electricity from contact with the road**
 - ◊ <https://www.digitaltrends.com/cars/goodyear-bh03-and-triple-tube-concept-tires/>
 - ◊ <https://corporate.goodyear.com/en-US/media/news/Goodyear-Concept-Tires-Offer-a-Glimpse-of-the-Future-1426100308105.html>
 - ◊ <https://www.wired.com/2015/03/goodyear-trying-make-electricity-generating-tire/>
 - ◊ [Thermophotovoltaics](#)
 - ◊ <https://spectrum.ieee.org/energywise/green-tech/solar/thermophotovoltaic-device-has-potential-to-reach-huge-solar-efficiencies>
 - ◊ <https://tlo.mit.edu/technologies/high-efficiency-micro-thermophotovoltaic-generator-system>
- **Solar Panel Positioning Robots**
 - ◊ <https://www.technologyreview.com/s/429087/a-robot-to-tilt-solar-panels/>
 - ◊ <https://www.forbes.com/sites/toddwoody/2012/10/31/how-robots-are-making-solar-power-cheaper/#4f74ac8331a7>
- **Biocoal**
 - ◊ <https://phys.org/news/2017-11-technology-biomass-coal.html>
 - ◊ <http://www.antaco.co.uk/biocoal/>

- **Gray Water in High Rise Buildings**
 - ◊ [https://www.researchgate.net/publication/261701503 Energy generation from grey water in high raised buildings The case of India](https://www.researchgate.net/publication/261701503_Energy_generation_from_grey_water_in_high_raised_buildings_The_case_of_India)
 - ◊ <https://quantizedmagazine.wordpress.com/tag/recycled-gray-water/>
- **Energy-Harvesting Bracelets to Power Wearable Electronics**
 - ◊ [https://www.researchgate.net/publication/261701503 Energy generation from grey water in high raised buildings The case of India](https://www.researchgate.net/publication/261701503_Energy_generation_from_grey_water_in_high_raised_buildings_The_case_of_India)
 - ◊ <https://www.nextbigfuture.com>
- **SALT (Sustainable Alternative Lighting) Lamp**
 - ◊ <https://newatlas.com/salt-sustainable-alternative-lighting-lamp-saltwater/38626/>
 - ◊ https://www.huffingtonpost.com/entry/salt-lamp-philippines_us_55c0df62e4b0c9fdc75df8e2
 - ◊ <https://techxplore.com/news/2015-07-salt-lamp-people-electricity.html>
 - ◊ https://www.amazon.com/Lantern-Charger-Aluminum-52500Mah-electronic/dp/B076F9XZ1V/ref=pd_lpo_sbs_468_t_0?encoding=UTF8&refRID=SZ142N6N32K7XB61PX69
- **Carbon Positive House—everything about this is GENIUS**
 - ◊ <http://www.eco-business.com/news/case-study-the-carbon-positive-house/>
- **Portable Wind Turbine**
 - ◊ <https://newatlas.com/trinity-portable-wind-turbines/39522/>
 - ◊ <https://projectearth.us/want-a-portable-wind-turbine-now-you-can-have-one-1796423389>
- **Biophotovoltaic Cells**
 - ◊ <http://news.mit.edu/2012/biosolar-0203>
 - ◊ <https://newatlas.com/mit-diy-solar-cells-grass-clippings/21341/>