

Environmental Impact of Computing-Activity Template

Preparation

- Prepare to play two youtube videos related to lithium-ion batteries during the meeting. The first video link is [here](#), and the second video link is [here](#).
- Send out a message to the students
“Hello everyone. How is everyone doing? For next week’s meeting, we will discuss the environmental impact of technology, specifically on lithium-ion batteries. I have prepared a few discussion questions for us. Be prepared to share your opinion on lithium-ion batteries. I am looking forward to meeting with all of you.”

Goals and Outcomes: PACE-internal

- show the first-year students to understand how a lithium-ion battery work
- Share information on Help students gain knowledge about the current industrial needs and the views of environmentalists on lithium-ion batteries

Goals and Outcomes: Student-facing

- I will learn about the environmental impact of technology, specifically on the lithium-ion batteries
- I will get to know the battle lines between the environmentalists and industrialists on lithium-ion batteries. I will be able to develop my own view on the use of lithium-ion batteries.

Script

[Location: at regular meeting room, CSE 4140]

“Hello everyone. I hope everyone has had a wonderful week. Today, we will be discussing the environmental impact of technology. We all know that the industrial revolution has carried out massive new technologies with immense power. However, many technologies have brought negative impacts on our world. Today, we will focus on the depletion of natural resources today,

specifically the use of lithium-ion. After this meeting, you will develop your own view on the use of lithium-ion batteries.”

“Before we get started with the discussion, let’s first watch a short clip that talks about how lithium-ion batteries work, and how the battery is being used. I will use this short video to introduce lithium-ion batteries so that you can get an idea of what we will discuss today”

[play the first video]

“From the videos, we learned that lithium-ion is one of the major components of modern batteries. If all of you can look around in the room, what items can you recognize in this room operating using lithium-ion batteries?”

[waiting for answers]

“Great. We can see that lithium-ion batteries are used in many common electronic devices, such as phones, tablets, and computers. We are so used to using lithium-ion batteries on a daily basis, but I don’t think many of us would spend time learning about the environmental impact of mining lithium-ion. We will take the time that we have today to discuss this. I will group everyone into groups of three, and give you around 10 to 15 minutes to discuss. Here are the three questions that I would like everyone to discuss with your group mates.

1. Based on your own knowledge, do you think driving an electric car would benefit the environment? Why or why not?”
2. From the first videos, we learned that most of the lithium-ion battery production is conducted overseas, however, due to the increasing demand for more batteries especially for electric cars, the US would need to start new mining projects domestically in order to meet the demand. How do you feel about this situation?
3. Do you think we can recycle lithium batteries? Could you guess what materials would be recycled from used lithium batteries?

[wait for about 10 minutes for the students to discuss]

“Alright. Time’s up. I would like to hear your opinions on all the questions. I want at least one of you in the group to share your thoughts on these questions.”

[hearing answers from the students. Remember to encourage and compliment students for their participation in the discussion]

“Great. I will talk about the third question that I asked. Do you think we can recycle lithium batteries? What kind of materials would be recycled from used lithium batteries? There is an answer to the two questions. The United States Environmental Protection Agency's website answered the questions as “Today, Li-ion batteries are made from minerals such as lithium, cobalt, nickel, and manganese. Currently, cobalt, manganese, and nickel are often recovered. Lithium may also be recovered, but it often must be further processed for it to be used again.” So, lithium-ion batteries are recyclable, but the process of recycling them can be complicated. Therefore, we can't handle lithium batteries on our own like other materials. If you would like to learn more about the disposal of lithium batteries. I suggest you go to the EPA's website to look for more information. I will also send out a link to the frequently asked questions on lithium-ion batteries. Next, I would like to show you a longer clip. This video talks about the battle line between the environment and industrialists over a proposed mining project in Northern Nevada. The video shows both sides. I think it would also give us more of a chance to learn about the environmental impact of lithium-ion batteries.”

[play the second video]

“So, what is your reaction to the conflicted project between environmentalists and industrialists on lithium-ion mining in Nevada? Do you think the government should be more cautious with decisions like this? What kind of government regulation do you think is needed here? Would you support the use of electric cars? I would like everyone to discuss these questions with your group members again. I will give you another 10 minutes to discuss this. ”

[wait for about 10 minutes for the students to discuss]

“Okay. Like what we did before, I want at least one of you in the group to share your thoughts on these questions. I want someone who hasn't answered any questions before.”

[go around the group and hear everyone's opinions. You still need to make sure you are being encouraged. You should not give any judgmental comments on their opinions, instead, a compliment for their participation]

“Thank you for everyone's participation. That is all the activities that we have for today. I hope you learned something about lithium-ion batteries in this meeting. I think right now you would have a better understanding of lithium-ion batteries and could make better judgments on whether the use of lithium-ion batteries is beneficial. Thank you. See you next week.”

Post-session

- Fill out the survey form
 - What activities did you do
 - How did they go
 - Any concerns