To our teachers:

You may delete this page from the document that follows after reading it.

At the bottom of this page we've reproduced the "human-readable summary" of the copyright we adopted from Creative Commons. Consult this summary if you intend to copy and redistribute our material in any medium or format, or adapt, remix, transform, or build upon it.

Click here to view and read the same plain, readable summary of the Creative Commons copyright license we've adopted online. The online version provides additional information on some of the terms in the summary.



Neither summary is a legal substitute for our actual Creative Commons license, which may be found by clicking here.

The human-readable, Creative Commons copyright license summary:

"

You are free to:

- **Share** — copy and redistribute the material in any medium or format
- **Adapt** — remix, transform, and build upon the material

The licensor cannot revoke these freedoms as long as you follow the license terms.

Under the following terms:

- **Attribution** — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.
- **NonCommercial** — You may not use the material for commercial purposes.
- **ShareAlike** — If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original.

No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

"



Wisconsin Public Service
SolarWise for Schools
and the
Center for Renewable Energy
Advanced Technological Education

SIGNAL FOR A BETTER WORLD

INSTRUCTOR'S GUIDE

Grade Level:	High School, Technical College, Community College
Lesson Length:	3-4 class hours, depending on coverage and emphasis
Author:	Scott Liddicoat
Created:	October, 2023

Objectives:

- Students will understand that the purchase of any product sends strong signals to a free market about what people want and do not want.
- Students will understand that the purchase of any product sends strong signals into a free market economy about what jobs are valued, what capital is valued, what natural resources are needed, and what wastes have to be dealt with.
- Students will understand that they swiftly change America according to their values with every purchase they make--they literally "vote with their dollars."
- Students will understand that they can change the world in extremely meaningful ways if they can make a profit producing a product or service that people are willing to freely pay for.
- Students will understand that free markets coordinate complex economic production variables without significant overproduction and waste and without significant shortages.
- Students will understand that centrally-planned economies take away freedom of choice, and frequently lead to overproduction, waste, and shortages.

The Main Thing:

Signal For A Better World is a student lesson about responsibility, inspiration, and leadership. It's about responsibility in spending by understanding the consequences of every spending decision. It's about inspiration in spending through changing the world according to one's values with each spending decision. It's about leadership through the possibility of one day providing a product or service of quality and price that people are willing to freely buy and changing the world for the better in the process.

To begin this activity, students examine a simple pizza purchase and its consequences in detail. Through the dynamics of that purchase, they learn they are very quickly and

effectively changing the world with each spending decision they make. And perhaps you have a student in class right now who seems especially motivated to be a leader in changing the world in an important and meaningful way. This lesson can point them toward the dynamic process of free market enterprise where they can swiftly and effectively bring about meaningful change.

This lesson makes clear the obvious fact that we "vote with our dollars" with each and every purchase we make. That understanding gives your students the opportunity to exercise responsibility and leadership many times almost every day. Understanding it gives students the opportunity to change the world and make it a better place almost every day.

With some basic market science principles in hand, your students may be inspired to become solutions to the problems they see around them today and coming at them in the future. With these same basic principles in hand, you can return to the lessons drawn from **Signal For A Better World** regularly throughout the year to add inspiration to classroom lessons on many topics featured throughout the **SolarWise for Schools Renewable Energy Curriculum** or **CREATE** curriculum.

Activity and Teacher Notes:

For most teachers, the hardest thing about this activity is doing it for the first time. However, the economics embedded in this lesson have been simplified to make the science easy to comprehend. Teachers of this lesson will find that students like to talk about economics and relate to it very well when given a fun and educational platform like this.

A successful method for completing this activity in student groups is suggested and follows. The lesson could probably be completed other ways.

As with any other lesson, acquaint yourself with it as much as you can before using it for the first time. Read the **Student Lesson**, the **Instructor's Guide**, and the **Instructor's Answer Key** carefully.

Divide your class into groups no larger than four students. Make sure each group has access to a computer after the first day in the classroom. For the first day, make copies of the **Student Lesson** pages of **Signal For A Better World** for every student in class.

Day one:

Read the **Signal For A Better World** introduction to your students as your introduction to the lesson. After doing this lesson a couple of times, more informal introductions may suggest themselves to you. For example, you might begin by simply asking students what they bought last weekend. Or, you might ask students how they have changed the

world recently. In any case, keeping the introduction short and keeping the point of lesson relatively hidden from your students at this stage is helpful.

Break your students into groups at this point. Assign them the task of completing the **Signal For A Better World** table you copied for them. Every student should complete this table, writing down their own ideas and those of their group mates in the appropriate places. However, have students follow your prompts. Give your students perhaps 3-4 minutes to make as complete a list of Employment as they can. Then give them 3-4 minutes each to complete each of the other lists in turn. A little prompting with examples may be necessary through this process. However, students are clever and imaginative, and without much help they can usually do a pretty thorough job.

After finishing the four lists, visually (chalkboard, overhead, smartboard, projection screen) summarize everyone's work. Ask students around the room to offer what they wrote down for Employment until your recap includes everything that every student wrote down. This is an easy way to encourage participation for even your most reluctant participators. Have students write down on their lists anything that they didn't have written down before beginning this all-class summary. Move to the next list, then the next and summarize in the same way.

Recapping this way will also lead the way to active discussions that will come later. Do not let students go to absurd thinking in completing their lists, or your summary list. However, encourage them to think far afield. For example, a student may suggest Employment that is needed in only a small way in the process of making the pizza and getting it to them. Any job belongs on the list if, in some way, large or small, it needs to be performed so that the pizza can be made and delivered. When you are done recapping, your list and your student's lists should be pretty long.

After recapping, it is time to lead students into discussion, moving toward the questions they'll sequentially answer in the lesson. A simple way to do this is to ask the question, "What do you think is the point of this activity?" There will be many student answers to this question. Promote responses from students that suggest that they are capable of exercising responsibility and leadership in many ways by how they spend their money. After all, they didn't have to buy pizza. They could have purchased something else that would have led to many different consequences. Many students will pick this concept up quite nicely after they have completed their "Waste" list—a list that makes some students a little uneasy when they see it applied to such a simple purchase for the first time. Point out that <u>we all literally "vote with our dollars" every day with every single purchase we make</u>, and that vote includes waste.

Assign students to complete questions 1-7 in the Student Response Guide as homework before they leave class for the day. They should do this individually on the **Student Response Guide** available to them digitally. Alternately, they can contribute to group homework individually through a **Student Response Guide** that you have made into a shared document for their group.

Day two:

The primary classroom emphasis on this day is "voting with your dollars." Through questions, answers, and discussion, make sure that students understand the (sometimes not so) obvious fact that we "vote with our dollars" with each and every purchase we make. Understanding that gives your students the opportunity to exercise responsibility and leadership many times almost every day. Understanding it gives students the opportunity to change the world and make it a better place almost every day.

A simple way to approach this would be to review and discuss student answers to assigned questions 1-7 to start the class period. Then have students return to their groups to complete questions 8-17 in class. In this setting, students should consider each question in order and take turns word processing a group answer to each. This works especially well if you have arranged for your students to complete this assignment through a shared document that you have set up for their group. Doing this will naturally free you to do more facilitating and coaching for student understanding, which is a positive feature of this lesson.

Take the time before the end of class to reemphasize the concept of “voting with your dollars" by reviewing several of the questions that students have just completed. You might also ask them to provide examples from their own experience to illustrate some of their answers. You might also ask students to discuss some of the purchases they will make today in light of what they have learned.

Your students should now see that they exercise tremendous power almost every day. This power comes with responsibility and the opportunity for leadership. Students literally "vote with their dollars" for the way they want America to change or remain the same with every single purchase they make. There may be some students who do not want to acknowledge this, and some who may want to ignore it, but that does not change the fact that they are voting this way. This may be some of the best education you can offer students in their entire school experience. It is immediately applicable and useful from almost the moment they leave your classroom, and then throughout the rest of their lives.

Assign students to complete questions 18-24 in the Student Response Guide as homework before they leave class for the day. They should do this individually on a **Student Response Guide** available to them digitally. Alternately, they can contribute to group homework individually through a **Student Response Guide** that you have made into a shared document for their group.

Day 3:

The primary classroom emphasis on this day is "voting with your dollars" for renewable energy.

Carefully review student answers to assigned questions 18-23 to start the class period. Generate discussion around these key points of emphasis for today:

- Renewable energy technologies, like solar PV panels, require inputs of resources and energy to produce. Their production therefore, requires pollution emissions as well. Solar PV panels “clean” and “green” status must take this part of their life cycle—their production— into account. This is called accounting for embedded resources, embedded energy, and embedded pollution.
- People who purchase and install solar panels are voting to change America. They are switching their energy production from mostly utility-provided, nonrenewable resources to a self-provided renewable energy resource.
- To change to a more renewable and solar America, two important things need to happen. Innovations in solar PV panel technology, design, production, and installation need to occur to make them more cost competitive in the marketplace. Also, marketing needs to improve to make the benefits of renewable energy technologies in general, and solar in specific, more understandable to the American public. Your students can make the world a better place if they can do something to meet these needs in the future.

Take the time before the end of class to draw together the overall point of the lesson—“voting with your dollars" to make America a better place. This lesson empowers students and is immediately applicable in their lives with an immediate impact. The lesson will be just as empowering and immediately applicable every day for the rest of their lives.

Follow up:

Be sure to follow up this lesson regularly.

You may, throughout the year, come across an energy topic or renewable energy topic in need of innovation or improved marketing. Remind students that they can change the world through their purchases of those products, or by getting into the business of improving energy technologies and their marketing in our country.

Another simple review technique is to occasionally ask your students what they have done lately to improve America. Or, ask them how they’ve voted lately. This can lead to some very interesting discussions about purchases, the signals they send, and the America your students want America to be.

Another lesson, related to this one in spirit, is titled **Green and Greenwashing**. It’s short, easy, and fun for students to do. Consider following **Signal For A Better World** with **Green and Greenwashing** later in the school year.

Summary:

There are other ways to conduct this activity. Feel free to experiment, especially after you have used **Signal For A Better World** a few times. Remember too, that this lesson is like all **SolarWise** or **CREATE** lessons in that it can be edited. You may add additional material or questions or remove some material or questions to suit your specific classroom circumstances.

Inspire students to exercise responsibility and leadership today and throughout the rest of their lives with **Signal For A Better World!**