



ACTIVITY 3

# Gathering Residents' Values

SURVEY

## ACTIVITY 3

# Gathering Residents' Values

## ACTIVITY SUMMARY

Students further explore the values of the people of Vanwick. Students create a survey to capture the values of residents. Then they take the survey, each playing the role of a different fictional stakeholder. This provides some information on how the people of Vanwick value the issues related to Project REV. Students analyze the survey results of the stakeholders in Vanwick and are introduced to the concept of weighted values.

ACTIVITY TYPE  
SURVEY

NUMBER OF  
40-50 MINUTE  
CLASS PERIODS  
2

## KEY CONCEPTS &amp; PROCESS SKILLS

- 1 Values affect people's decisions. There can be disagreement within a community when people hold a variety of values.
- 2 Community decisions are more likely to be accepted if the values of all stakeholders, especially those who are underrepresented, are considered in the decision-making process.

CONCEPTUAL  
TOOLS



## VOCABULARY DEVELOPMENT

### stakeholders

the set of people who will be affected by the outcome of a decision

### weighted value

a value that includes a number showing its relative importance to other weighted values

## TEACHER BACKGROUND INFORMATION

### Weighted Value

A value's weight for a community is a function of both how commonly and how strongly that value is held. There is no one right way to weigh these two attributes of values. While it would be easier to weight values based solely on the frequency of the value or strength of the value from the person who cares the most, that approach is problematic. For example, a value that is held weakly by everyone, such as everyone in a class saving 20 cents, should not receive the heaviest weight just because everyone would like it a little. This weighting of the most commonly held values is a common way of thinking, but it can lead to inequitable decisions. For example, a value weighting based entirely on frequency across the community might lead to taking the land of a few farmers who have lived there for generations because it is preferred to an alternative location by everyone else, even though it is only a weakly held value. On the other hand, if the person with the strongest value preference gets priority, that one person may wind up exercising tyranny over the majority. An example of this is if one person desperately wants to sell a shared property because they need the money, while everyone else would like to keep it. While selling the property would make the one owner very happy, it is not fair to everyone else.

## MATERIALS & ADVANCE PREPARATION

<p>FOR THE TEACHER</p> <ul style="list-style-type: none"><li>INTERNET ACCESS TO SURVEY PROGRAM</li><li>VISUAL AID 3.1 "Example Survey Questions"</li></ul>	<p>FOR EACH GROUP OF FOUR STUDENTS</p> <ul style="list-style-type: none"><li>SET OF STAKEHOLDER CARDS (4 of the 8 cards)</li><li>INTERNET ACCESS TO SURVEY PROGRAM</li></ul> <p>FOR EACH STUDENT</p> <ul style="list-style-type: none"><li>STUDENT SHEET 1.1 "Unit Concepts and Skills" (OPTIONAL)</li></ul>
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Although each group needs 4 cards, there are 8 different stakeholders shown on the cards. It does not matter which stakeholders are assigned to the groups, as long as they are all represented in the survey. Decide if you would like to assign the cards at random or have half the class use one set of 4 cards while the other half of the class use the remaining 4 cards.

Review the software for making a survey and create an example survey to share with students.

# TEACHING NOTES

Suggestions for **discussion questions** are highlighted in gold.

Strategies for the **equitable inclusion of diverse students** are highlighted in pink.

## GETTING STARTED (10 MIN)

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### 1 Introduce the purpose of survey data.

- Have students read the introduction and review the newly introduced word *stakeholder* as it will continue to be incorporated in the decision-making process as the unit progresses.
- When reviewing the description of group decision-making provided in the introduction, make clear that when an individual makes a decision with the aim to satisfy the needs and values of others (as in the previous example of the burger and salad), it is not actually a group decision. A group decision involves input from multiple people.
- Have students share their experiences completing surveys and share some examples. Ask students to describe the different situations in which they have completed a survey or questionnaire. They may include situations such as a marketing survey, a government form, or even teacher-directed questions in class.
- Ask, **What do you think the people who create surveys do with the information they gather?** Students may not have thought about how the data is applied, but they should be able to see that a basic use would be for product development. Discuss other uses, such as selling data to advertisers, census-taking, political ambitions, and more. A simple example might be product-survey responses compiled about the question *How would you rate this product on a scale of 1 (low) to 5 (high)?* The company might make a different decision about the product in the future if the average response was 1 compared to 5.

## PROCEDURE SUPPORT (60 MIN)

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### 2 Familiarize students with the data that can be collected with surveys.

- Review the scenario in the Student Book that describes that the goal of the activity is to gather the values of the Vanwick residents around issues related to Project REV. Before beginning to generate questions, have students brainstorm the types of things people might value in the community, in general, before discussing values about renewable energy. Then ask, **How can you find out people's values relevant to Project REV?** Accept all responses as students consider how to find out what people value. If they miss it, suggest a survey as one common way to get a lot of information with less effort than some other approaches.
- Emphasize that the survey results should identify the values of the people of Vanwick instead of facts about the project. Since facts can be gathered without participation from the residents, the survey should focus on finding out what is important to residents. For example, if a student says that they need to know the cost of each proposal, ask them what values would lead them to need that information—for example, the value of keeping costs low.

### 3 Support students as they develop a survey.

- Many students have experiences taking surveys but not creating them. Check students' background in this area and provide direct instruction if needed. Walk students through how to build the survey electronically in the program available to the class. Provide an example and model how to create different kinds of questions and responses. Show students how to create items that include short answers, multiple choice, short response, matching, rank ordering, and anything else you can think of.
- During the procedure, make sure students have a clear understanding that they need to compile the responses into a summary that will show an overall view of the values. Questions with quantitative responses or multiple choice allow for that. For example, if the survey question asks residents to put the values in order from most important to least important, students can assign a number to each value, based on the priority it was given by a resident—the highest priority might be 4, and the lowest priority might be 1. Students can then calculate the average priority for each value.
- Use Visual Aid 3.1, “Example Survey Questions,” to demonstrate strong questions (rank ordering, linear-scale grids), mediocre questions (series of multiple choice, open-ended), and poor questions (short answers).
- Make sure the questions cover the necessary range. It is very important that students create a survey that captures as many values as possible. Students have a tendency to create questions that only addresses one or two values, which is not enough for students to be able to see prioritized values in the data. One option is to provide a master list of all the values that appear (see Table 3.1: Summary of Data from Cards) to guide their questioning.

- For students who need more support in generating questions, consider providing a list of questions from which they can select, or have them create a combination of self-generated and selected questions.
- To compile the final survey from student questions, use whatever method makes the most sense. Students could evaluate the questions on a scale of 1 to 5, they could vote on the questions, or the questions could just be selected by the teacher.

#### 4 Support students' role-playing in Procedure Part B.

- In Procedure Part B, students complete the survey in the role of the stakeholder they are given. Before students do so, it might be helpful (after they read their cards) to have them describe the characteristics and values of their stakeholder to others in their small groups. For emerging multilingual learners, students could describe this orally, through pictures and diagrams, through poetry, or with music. For example, you could have them choose a song that they think best embodies their stakeholder's character and explain why that song suggests that person's values.
- When students complete the survey, make sure they complete it in the role of the stakeholder and not as themselves. The answers should reflect the values described on the card they have been assigned. You may want to assign one stakeholder per pair so they can complete the survey together.
- For better accessibility to the intention of each of the stakeholders, you may choose to have similar stakeholders from different groups get together and complete the survey as a group.

#### 5 Develop the concept of a weighted value.

- When students present the data, aggregate it as a class to show the most common values that appear for the responses. The stakeholder cards are written so some values are more common than others. Students should find that the most common values are:
  - reduction of greenhouse gases
  - not obstructing views
  - job number and security
- In Procedure Step 8, a well-constructed survey should show the approximate values in Table 3.1: Summary of Data from Cards. This information will vary depending on the survey, so the following summary is provided to check for consistency with the survey data collected. For the individual stakeholders, the values on the cards are roughly listed by how important that value is to them.

**TABLE 3.1**  
Summary of Data from Cards

STAKEHOLDER VALUES	HIGHEST PRIORITY	MODERATE PRIORITY	LESSER PRIORITY
reducing greenhouse gases	Jackson Moore Thomas Cho Roman Kozlov	Miguel Ortiz	
maintaining natural views (location)	Diya Khan	Olivette Allard Thomas Cho	Amber Wogan
maintaining/adding jobs	Olivette Allard	Flora Salazar	Thomas Cho Jackson Moore
stable electric/energy bills		Thomas Cho Amber Wogan	Roman Kozlov
not disrupting quiet (location)	Flora Salazar		Miguel Ortiz
health and safety	Miguel Ortiz	Jackson Moore	
support business/economy	Amber Wogan	Roman Kozlov	
reliable energy source			Diya Khan Flora Salazar
preserve historical sites		Diya Khan	
home values			Olivette Allard



- In Procedure Step 9, emphasize that when looking closely at the values of the community, they should be weighed by both how important a value is AND how common the value is. However, when aggregating the data, students should be careful not to weigh values by frequency only. This could inadvertently result in a most common value that is only weakly held by the community.

**Sample Student Response, Procedure Step 9**

- *reducing greenhouse gases*
  - *location: views*
  - *jobs*
  - *location: noise*
  - *electric bills*
  - *health and safety*
  - *supporting businesses*
  - *reliable energy*
  - *preserve historical sites*
  - *home values*
- Responses to Procedure Step 10, as shown in the following sample student response, should identify the most values previously listed. Answers will vary. The following list shows an example where the student weighs all mentions of the values equally.

**Sample Student Response, Procedure Step 10**

<i>reduction of greenhouse gases</i>	34
<i>not obstructing views</i>	33
<i>job number and security</i>	33
<b>Total</b>	<b>100</b>

If students assume that stakeholder values on the cards are listed in priority order, they might decide to weigh the common values differently. A sample response may be similar to the following:

<i>reduction of greenhouse gases</i>	45
<i>not obstructing views</i>	35
<i>job number and security</i>	20
<b>Total</b>	<b>100</b>

- While identifying the top three values is important because students will use these three values later in the unit, the actual weights that students decide on are not critical for this activity.
- When discussing the weighted values, encourage students to compare how the weighting could change the outcome in Vanwick. For example, if a resident’s highest weighted value is not obstructing views, then they might not choose wind turbines as part of the Project REV plan. If that value has less weight than reducing greenhouse gases, they might be willing to choose a wind turbine to achieve the more important value.

- If you have begun a word wall, add the terms *group decision-making*, *stakeholder*, and *weighted value*. Due to the abstract nature of these terms, it may help to provide an additional simple example for each term, such as the following:
  - Choosing a restaurant with friends is a group decision.
  - Students are stakeholders in the school cafeteria because they are affected by what food is served.
  - If you are a musician, you may value the quality of a recording more than the colors chosen for its cover.

## SYNTHESIS OF IDEAS (20 MIN)

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### 6 Use the Build Understanding section to further explore gathering values in a community.

- Discuss student responses to Build Understanding item 1, which emphasizes the advantages and disadvantages of using a survey to identify people's values. If students lack the background experience to know what a representative sample is, review what it means and discuss whether they felt their survey was completed by a representative sample.
- The responses to Build Understanding item 2 will indicate if students are considering those whose values were not included in the survey data. With the class, discuss why some people's values may not be represented. Reasons people's ideas might not be reflected in the survey could include:
  - They were not able to complete the survey.
  - They were not willing to complete the survey.
  - They did not have opportunity to complete the survey.
  - They misunderstood questions on the survey.
  - They filled out the survey but their perspective was not a frequent enough response to be prioritized (weighted).

Discuss possible outcomes related to missed data in group decision-making. Values could be missed or not prioritized. This could greatly impact the decision made for the group and could result in a negative outcome for that stakeholder whose values were not adequately captured in the survey. Good group decision-making looks to elevate voices that might not get heard otherwise.

**TEACHER'S NOTE:** If students have completed the previous unit, *Evidence & Causal Relationships*, they may recognize the importance of a large representative sample. Point out that unrepresentative samples create systematic error, and samples that are too small create random error.

- Ask, **What are some strategies that could be used to learn about stakeholders' values that might not be well represented in your survey?** Student responses could vary but could include ideas about going to the places that people in that community gather—such as community centers, markets, workplaces—and offer for them to take the survey there. Another idea would be to try to find a representative from a different community to share values on behalf of their community.
- You may wish to revisit Student Sheet 1.1, “Unit Concepts and Skills,” to help students formally organize the ideas introduced in the unit so far. Students can place the headings of the main ideas—facts, credible sources, and values—into the organizer and add examples from their classroom experiences in Activities 1–3. See the end of the Activity 1 Teacher’s Edition for a sample student response.
- Finish the activity by revisiting the Guiding Question, **How can a survey be used to gather information about community values?** Evaluate if your students are able to identify the essential ideas of values and weighted values through answering this question.

## EXTENSION (10 MIN)

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### 7 Use the Extension as an opportunity for advanced learning.

Students can connect the scenario to energy issues in their own community. By surveying their family and friends with the same survey used in the activity, they can get a sense of the values around renewable energy in their community. Ask students to determine the top three weighted values in their community and compare them to those in Vanwick.

# SAMPLE STUDENT RESPONSES

## BUILD UNDERSTANDING

- ① a What are the advantages of using surveys to gather information about stakeholders' values?

*One advantage is that you can reach a lot of people all at once by sending out a survey electronically. Another advantage is that people are used to responding to a question by ranking their answer with a 1–5 scale, and that is helpful when making a summary.*

- b What are the disadvantages of using surveys to gather information about stakeholders' values?

*One disadvantage is that the people who answer surveys are often self-selected, so you don't get a representative sample.*

- ② There are many challenges to capturing all perspectives in a community by using a survey. Whose values might not be captured in a survey? Why?

*People might not take the survey because they don't have time due to work or family/caregiving obligations, they are not literate, they may not be able to read or write the language in which the survey is presented, or they don't have access to a computer to complete the survey. These barriers to participating in a survey result in some perspectives being underrepresented in the survey results.*

- ③ How might identifying the values of different stakeholders be useful to the decision-making process?

*Identifying stakeholders' values is helpful because that information can tell you what various people want in an outcome. Also, if there is conflict, knowing values can identify the problem so it can be worked out.*

- ④ Imagine two students talking about renewable energy sources. One says, "I think switching to renewable energy sources is the most important action to save the planet, but having steady jobs in energy generation is important, too." The other student says, "My mom's steady job at the fossil fuel plant is the most important thing to my family, although I think renewable energy sources do help the environment."

- a** What, if any, similar values do these two students share?

*They have similar values that steady jobs in energy generation is important and switching to renewable energy sources is also important.*

- b** Why might they disagree about which energy source is best for their community?

*They might disagree because they have different weights on the values. Their most important values do not match, so there could be conflict. For example, the second person thinks their parent's job is the most important consideration, so they are not likely to agree to any action that would jeopardize that job.*

## CONNECTIONS TO EVERYDAY LIFE

- ⑤ Think about a significant decision that you must make in the near future.

Answers can vary. One sample response follows.

- a** Record the decision and make a list of all your values related to it.

*Should I try to find a job in a coffee shop?*

*Values related to working: Need some money, don't want to do math, hate standing still, like social interaction*

- b** Weight the values, as you did in the procedure, with points that add up to 100.

<i>need some money</i>	<i>50</i>
<i>don't want to do math</i>	<i>5</i>
<i>hate standing still</i>	<i>10</i>
<i>like social interaction</i>	<i>3</i>

- c** Does the decision benefit from assigning weights to your values? Explain why or why not.

*Yes, this is helpful because it makes me realize that I have not wanted to work at a coffee shop because I hate doing math. So I am a little scared to be working at the register, but that value is actually not as important as the others, like making money and being social.*

## EXAMPLES OF STRONG QUESTIONS

### Multiple Choice Scale or Grid

Responses can be averaged to compare across values.

Answer the questions about Project Rev on a scale of 1 to 5 (1= not important, 5 = extremely important).

QUESTION	1	2	3	4	5
How important to you is reducing greenhouse gases?					
How concerned are you that the new energy sites will disturb the beauty of the land?					
How much do you value a plan that would grow business and support the local economy?					
How important is keeping electricity costs low?					
How important is keeping your electric bills low?					
How concerned are you that the plan will affect the health or safety of people?					
How important is it that the plan provides local jobs?					

## EXAMPLES OF MEDIOCRE QUESTIONS

### Multiple Choice

Questions can compare only two values at a time, so there is additional analysis required after the data is collected.

**Is reducing greenhouse gas emissions more important to you than keeping electricity costs low? (Choose one.)**

- YES    NO    THEY ARE EQUALLY IMPORTANT    THEY BOTH DON'T MATTER

**Is reducing greenhouse gas emissions more important to you than having Project REV provide new jobs? (Choose one.)**

- YES    NO    THEY ARE EQUALLY IMPORTANT    THEY BOTH DON'T MATTER

**Is reducing greenhouse gas emissions more important to you than the project affecting views of the local countryside? (Choose one.)**

- YES    NO    THEY ARE EQUALLY IMPORTANT    NEITHER ONE MATTERS

### Paragraph/long answer

Responses show most or least important values and important reasoning, but it is difficult to compare responses.

**Which of the following values is most important to you and why? (Choose one.)**

- reducing greenhouse gases
- keeping noise down
- providing new jobs
- keeping natural views
- supporting local businesses
- maintaining low electric bills

**If there are aspects of the Project REV plan that you are against, what are they and why is this important to you?**

## EXAMPLES OF POOR QUESTIONS

These questions elicit opinions rather than values.

### **Are you okay with the plan?**

This asks for an opinion only and does not ask about a value(s) that motivates that opinion.

### **Do you think Project REV will create a lot of new jobs?**

This is a question about fact, not value.

### **Would you be okay with putting a wind turbine near your house?**

This asks for opinion only and does not ask about a value(s) that motivates that opinion.

### **How do you think Project REV would affect you?**

This is an open-ended question that could elicit opinions about facts or values, or neither.



## OLIVETTE ALLARD

CONTRACTOR

As a contractor, I do electrical work frequently, so I know how important electricity is to our everyday lives. I think Project REV is a great way to increase job opportunities for electrical workers in the area. Transitioning to renewable energy generation will mean the whole system will need to be upgraded. There will be jobs that help increase the capacity of the system as well as jobs to upgrade the electrical power transmission lines and improve distribution. At the same time, I am worried that Project REV is going to put this new infrastructure, along with the solar panels and wind turbines, in an area that will disrupt our beautiful landscape. We have ruined so much forest already by running transmission lines to faraway places. Furthermore, ruining the natural world surrounding Vanwick might make this a less desirable place to live. I'm worried this change to Vanwick might decrease my home's property value, and I could lose money.



### VALUES

- creating jobs
- maintaining beautiful views
- keeping value of home

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## THOMAS CHO

OFFICE WORKER

At the office, I see the energy bill for our building when it comes in. I know how much natural gas we burn in the furnaces all winter just to keep our large building heated. When I think about all the buildings in the area that all emit a lot of fossil fuels with our heating systems, it feels like we are just burning up our future! Project REV can change that, so I am thrilled it is happening. My high-rise building has a beautiful view of the Distant Hills Open Space Preserve, so I don't want to disrupt that because I see it every day. I feel lucky because I have friends who will need new jobs when the coal plant is closed. I hope Project REV will give them at least short-term work helping build everything for the new energy system.



### VALUES

- reducing greenhouse gases
- maintaining beautiful views
- creating jobs

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## DIYA KHAN

VANWICK HISTORICAL SOCIETY MEMBER

I go hiking every week in the Gentle Hills area, and I heard that they are thinking of installing wind turbines or solar panels for Project REV there. What a horrible idea! Solar panels will take up so much room in that area that the hiking trails could be ruined. I am not so sure I want to hike the trails anyway if I am just looking at a sea of black panels. I think it is important to not have any changes to the land so we can preserve our history and way of life in Vanwick. Plus, I've heard from a family member that solar panels and wind turbines only work when the weather is sunny and windy. We might use all our resources to install these huge devices, and they may not even work when the weather conditions aren't right. I don't understand why Project REV wants to replace a reliable energy source with one that doesn't work all the time. This Project REV is not the answer!



### VALUES

- maintaining beautiful views
- preserving historical places
- reliability of supply

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## ROMAN KOZLOV

FARMER

I run a small farm, and I was born and raised in Vanwick. As someone who works on the land, I want to help take care of it. My family and I love this place and want to help move it into a good future. I have started lowering our greenhouse gas emissions on the farm in other ways, so I support Project REV. I'd be willing to have renewables installed on my land, especially wind turbines installed in my fields. I think wind turbines are the coolest, and I wonder if we could run the whole city off of them! I'm looking forward to someday replacing my diesel-powered tractors with electric versions. If I could get the electricity for the electric tractors from renewable energy, that would really help bring down the greenhouse gas emissions from my farm. Plus, I think it will support my business because the changes I'm willing to make for Project REV will reduce my overall energy costs for the farm to help keep expenses down.



### VALUES

- reducing greenhouse gases
- supporting business
- not increasing energy bills

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## JACKSON MOORE

HIGH SCHOOL STUDENT

I'm a student at Vanwick High School. I really care about what happens to our environment in the future, and I completely support Project REV. It is about time we worked together to address this issue! It has been difficult knowing that the biggest challenge of our time is lowering our greenhouse gas emissions, but as an individual, I am only able to do small things toward this goal. My mom works at the power plant that is closing down, so I am worried that she won't be able to get another job. If she can't find permanent work after the plant closes, I may have to work a lot more at my after-school job. However, I am grateful that she will no longer be subjected to the poor air quality near the plant.



### VALUES

- reducing greenhouse gases
- creating jobs
- supporting health and safety

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## MIGUEL ORTIZ

HOSPITAL WORKER

I'm a medical worker at Vanwick General Hospital. I am very happy that we are considering replacing the coal plant with renewable energy options. I have worried for a long time about the greenhouse gas emissions that coal plants put into the atmosphere. At my job, I see a lot of people with health effects from the coal plant, such as asthma that can be triggered by the air pollution. Something else that's really important to me is to make sure the new infrastructure for energy generation is quiet. The hospital setting is sometimes very hectic, and I really value quiet time at my home in Vanwick to keep a balanced lifestyle.



### VALUES

- reducing greenhouse gases
- supporting health and safety
- keeping noise down

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## FLORA SALAZAR

VANWICK CITY LIBRARIAN

I am excited that Project REV will bring money into our city, but I am most concerned about installing wind turbines. I know someone who knows someone who says that wind turbines can be very noisy. I want to make sure there aren't any devices such as wind turbines or electrical substations where I live near City Park. They could disrupt me at home. Getting solar panels instead of wind turbines sounds better to me, but how can they be reliable if they don't work at night? I don't want to close the library early when it gets dark! I have lived and worked in Vanwick for a long time, and I just love the community of readers that are here. I hope this gets worked out because I don't want friends to lose their jobs in Vanwick.



### VALUES

- keeping noise down
- maintaining jobs
- reliability of supply

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3

## AMBER WOGAN

SMALL BUSINESS OWNER

I own a restaurant in downtown Vanwick that has been in my family for three generations. As someone who has lived and worked in Vanwick my whole life, I hope that Project REV is good for all the small businesses in town. My biggest concern about Project REV is if there will be an increase in the cost of electricity for consumers due to the change in electrical systems. I am not sure my business could afford to pay more for electricity that runs the restaurant. We already pay a lot to keep the lights, heat, stoves, and ovens running. I hope that Project REV doesn't stop tourists from visiting the town to enjoy the Nature Forest, City Park, and Gentle Hills Open Space Preserve because they are full of unattractive solar panels and wind turbines.



### VALUES

- supporting businesses
- not increasing electric bills
- maintaining beautiful views

SCIENTIFIC THINKING FOR ALL: A TOOLKIT  
UNIT 6: Group Decision-Making, Activity 3