

Sustainability Teachers' Academy Lesson Plan

Sustainable Neighborhoods for Happiness

Topics Covered

Sustainability
Happiness
Urban Systems
Water, energy, waste, &
food management

Grades

6-8

Duration

55 Minutes

Sustainability Competencies

Values Thinking
Systems Thinking
Collaborative Thinking

Key Questions

What makes a sustainable neighborhood? What is the relationship between happiness and sustainability? What makes a happy neighborhood?

Objectives

Students will be able to:

- Identify components of a (un)sustainable neighborhood
- Analyze neighborhood practices and structures in terms of sustainability
- Critically reflect upon 'real estate brochures' for each neighborhood
- Justify ratings for each measure of the Sustainable Neighborhood for Happiness Index
- Articulate the difference between a neighborhood that has a high SNHI score and one that has a low SNHI score

Overview

In this activity we are going to explore neighborhood systems and evaluate neighborhoods according to a youth-friendly version of the Sustainable Neighborhoods for Happiness Index (SNHI). According to research by Arizona State University, Sustainability Scientist Dr. Scott Cloutier, a sustainable neighborhood is often also a happy neighborhood. Dr. Cloutier writes:

"Research indicates that sustainable development requires no sacrifices in happiness, but that design strategies can improve happiness and sustainability simultaneously (Zidansek, 2007). In addition, positive associations have been found between happiness levels and sustainable development (Leyden et al., 2011; Florida, 2010; O'Brien, 2001; Schimmel, 2009; Zidansek, 2007)."

But what constitutes a happy and sustainable neighborhood? For that we turn to the Sustainable Neighborhoods for Happiness Index. This index includes 9 different components and each of the components is evaluated based on indicators. The 9 components of the SNHI are: 1. Community Governance; 2. Water Management; 3. Energy Management; 4. Urban Design; 5. Food Management; 6. Business & Economic Development; 7. Waste Management; 8. Transportation; 9. Buildings & Infrastructure.

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We have streamlined these 9 components to 7 components with two indicators for each component. In the below table, we list each component with some prompts for what this looks like in a neighborhood.

Neighborhood Component	What does this look like?
1. Community Involvement	You can see announcements about community meetings and invitations to join sustainability groups and initiatives.
2. Water Management	You can see desert landscaping and native plants and the residents are happy with their tap water.
3. Energy Management	You can see solar panels or other renewable energies present in the neighborhood and the public lighting is energy efficient.
4. Community Design	You can see parks, preserves, and/or community gardens that are open to all community members and the services you use (such as grocery stores) are within walking/biking distance.
5. Food Management	You can see gardens in residents' yards, there are farmers markets held in the community, and/or there is a community garden.
6. Waste Management	You can see blue recycling bins in front of residents' houses on 'recycling day' and you can see household composting systems and/or the community garden has composting, and/or the neighborhood has a bin/pick-up system for composting that is similar to the recycling program.
7. Transportation	You can see large sidewalks, separated bike lanes, and shaded bus/light rail stops.

Materials

Per student group:

- 1 "Neighborhood Evaluation" worksheet
- 1 "Neighborhood Happiness Diagram" worksheet
- 1 "Neighborhood Promotion" (there are 3 different neighborhood promotions provided)

Each student should be given an exit ticket

Teacher Preparation

Review the Evaluation worksheet and be prepared to facilitate responses to indicators that the class is unlikely to be able to score based on the neighborhood brochures. The three neighborhood descriptions are written in a positive light, as though the students are reading real-estate brochures. However, that does not mean that all aspects described or shown in the photographs are positive. To help you facilitate a discussion that will enable the students to score the indicators, we have provided some information to link the descriptions and photographs to the measurements. Below are some key points for each neighborhood:

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In Downtown Tempe Students should notice

- Flood irrigation (mentioned in the narrative): Positively impacts shade and mitigates urban heat island but negatively impacts water usage and native landscaping
- Shade: look at the photo with the pedestrian and bike lane, does there appear to be adequate shade? Even though the neighborhood has parks and green space, there is not sufficient shade for all the bike lanes and sidewalks
- Street lighting: photo of house & of street, are there street lights? The lack of street lighting may make the neighborhood more energy efficient but also impacts the safety
- Sidewalks: there are sidewalks on some of the streets but not all. Notice in the photo of the house that there is not a sidewalk in front of that house

In Midtown Phoenix students should notice:

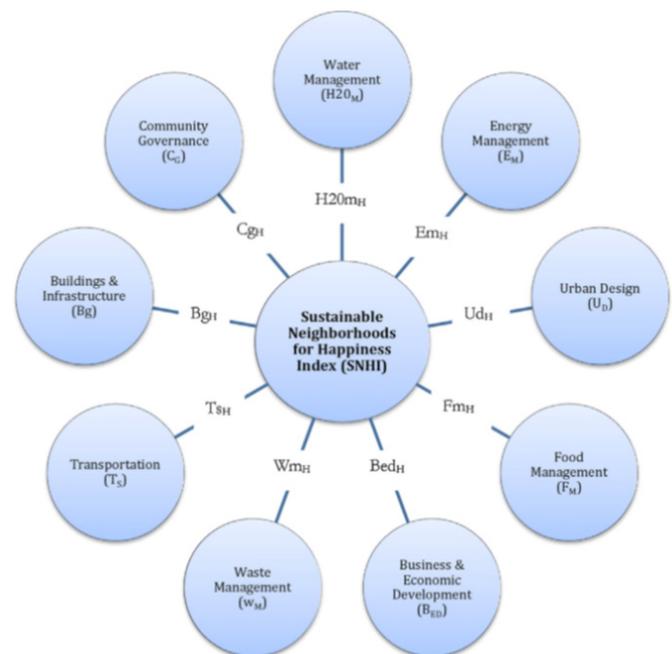
- Bike lanes are present on some streets, but not others. In fact, in one picture a bicyclist can be seen riding on the sidewalk where there is no bike lane—so there are not enough bike lanes, even on major streets such as the one pictured
- The large number of businesses along the central corridor all use most of their electricity during “peak hours” when demand is at its highest
- Although most of the streets have trees, how much shade do they actually provide to residents? Palm trees for example are trees but they do not provide sufficient shade

In Dobson Ranch students should notice:

- When the description says, “left behind its agricultural roots” this means that it does not allow any form of agriculture—no chicken raising or front yard gardens
- The neighborhood has some bike lanes but was designed to be convenient for people driving personal vehicles because buses and rail systems are not accessible in the community
- The HOA does not allow for composting or unsightly landscaping, which includes front-yard vegetable gardens.
- There is nothing said about shade because there is little shade along the roads because the neighborhood is designed for car-use.
- There is no mention of a farmers market or community gardens because there are none and there have not been attempts to provide greater access to resources through programs such as WIC or Foodstamps.

Background Information

The Sustainable Neighborhoods for Happiness Index (SNHI) is meant to serve as a means for assessing and comparing how well individual cities, towns, neighborhoods and communities address sustainability issues associated with residential happiness (Cloutier, et. al, 2014). This diagram (right) was developed for the article by Cloutier, et. al on the components that make up the SNHI.



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Recommended Procedures

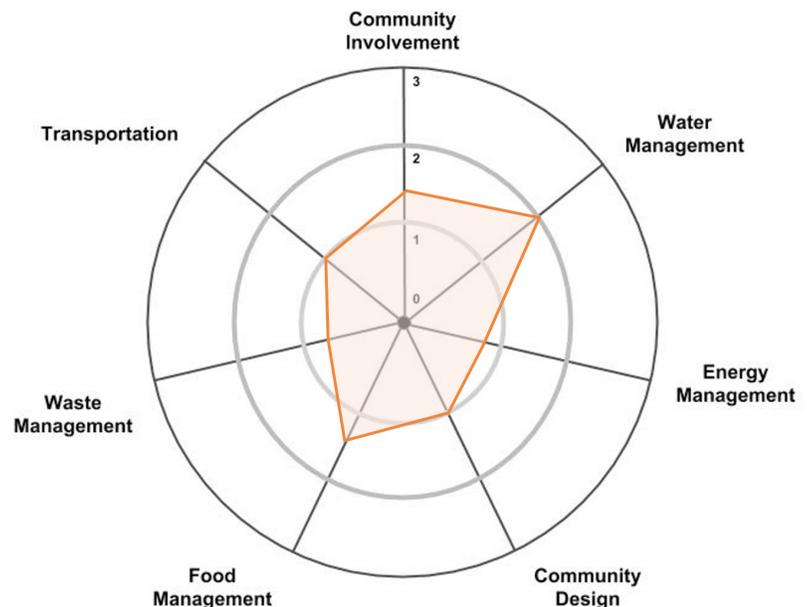
1. Engagement: This activity will focus students on the topic

Brainstorming: Ask your students to list components of a neighborhood or community? Probe them to think about where they get their water, food, how they move about the neighborhood, and even what the boundaries of their neighborhood are. Based on the list that the students have generated, try to group them by the components we are using to evaluate neighborhoods or fill in gaps as need. For example, students may say that their neighborhood has a basketball court, a park, a school, and a grocery store—those are all components of Community Design.

2. Exploration: A student-led activity with guidance

Break the students into groups and provide each group with an evaluation worksheet, a diagram worksheet, and a neighborhood description. The group should review the description of the neighborhood they have been assigned. Based on the description and photos they should discuss each of the indicators and provide a rating (1 to 3) for each indicator and write a brief justification for that score.

Once the students have scored all the indicators, they will plot the average scores for each measure on the Diagram worksheet. They should connect all the points so that they have an ameba shape (graph at right).



3. Explanation: Students discuss their understanding of the concept

A representative from each neighborhood group will now join a new group so that each new group has at least one representative from each neighborhood. They will discuss why they scored the various measures as they did, and show their diagram to their group.

Once all the groups have shared their diagrams and scores with each other, they will discuss the pros and cons of each neighborhood. What are some of the key differences between the three neighborhoods evaluated in this activity? How can one neighborhood learn from another neighborhood.

4. Elaboration: Students apply the idea in a new context

Have the students create recommendations for their neighborhoods to increase their community happiness and sustainability.

Now that the students have explored 3 different neighborhoods and have gained an understanding of the SNHI, ask them to discuss how the neighborhood around their school would fair

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in terms of this rating scheme. Ask them to describe things they see around the school and how those components impact the SNHI for the school neighborhood.

If time permits, take the students outside and explore the neighborhood, looking for components found in the SNHI.

5. Evaluation: Students assess their knowledge, skills, abilities

Each group should turn in their Evaluation workshop and each student should complete the Exit Ticket for this activity. Review the exit tickets for student comprehension and revisit and redirect as needed.

Extensions

If you want to further challenge your students, have them research the neighborhood around the school and evaluate the neighborhood based on the SNHI. We also recommend following-up this lesson with the Visioning a Sustainable Neighborhood for Happiness activity in which they design a sustainable neighborhood based on the SNHI.

Vocabulary

Sustainability: The ability to meet the needs of the future, without compromising the ability of future generations to meet their needs.

Homeowners association: A corporation formed by a real estate developer for the purpose of marketing, managing, and selling of homes and lots in a residential subdivision. It grants the developer privileged voting rights in governing the association. Membership in the homeowners association by homeowners is typically a condition of purchase; a buyer isn't given an option to reject it and is required to pay monthly or yearly fees to be in the Homeowners Association.

Down Lighting: Lights that do not cast any upward light is a part of the dark-sky movement to reduce light pollution. The advantages of reducing light pollution include an increased number of stars visible at night, reducing the effects of unnatural lighting on the environment, and cutting down on energy usage.

Composting: The process of turning your organic waste (food scraps, landscape trimmings, soiled napkins, coffee grounds, etc.) into nutrient-rich soil that can be used in gardens.

Sustainable Neighborhood for Happiness Index: A method of measuring how neighborhood design and use contribute to sustainability and the happiness of the residents in the community. These scores were created by sustainability scientists in order to compare neighborhoods, understand where the major problems are, and develop solutions to improve the sustainability of the community and happiness of the residents in the community.

References

Cloutier, S., Jambeck, J., & Scott, N. (2014). The Sustainable Neighborhoods for Happiness Index (SNHI): A metric for assessing a community's sustainability and potential influence on happiness. *Ecological Indicators*, 40, 147-152.

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Next Generation Science Standards

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and using models	Human impacts on Earth systems	Systems and system models
Analyzing and interpreting data	Interdependent relationships in ecosystems	Structure and function
Obtaining, evaluating, and communicating information		

Common Core English Language Arts

Reading: Informational Text	Writing	Speaking & Listening	Language
RI.6.2, RI.6.4, RI.6.7, RI.7.2, RI.7.4, RI.7.7, RI.8.2, RI.8.4, RI.8.7	N/A	SL.6.1, SL.6.2, SL.6.4, SL.7.1, SL.7.2, SL.7.4, SL.8.1, SL.8.2, SL.8.4	N/A

Common Core Mathematics

6 through 8	9 and 10

Other Common Core

Science	History/Social Studies
CCSS.ELA-LITERACY.RST.6-8.2, CCSS.ELA-LITERACY.RST.6-8.4, CCSS.ELA-LITERACY.RST.6-8.7	CCSS.ELA-LITERACY.RH.6-8.2, CCSS.ELA-LITERACY.RH.6-8.4, CCSS.ELA-LITERACY.RH.6-8.7