

Lesson Objective:

How do planners use mathematical tools to help them plan a community that accounts for various needs? By surveying and analyzing the needs of the people who live in the community, planners can determine the buildings and spaces that can create a vibrant place to live.

Lesson Description:

Students survey classmates and family about their needs in a community. Then students analyze the results of the survey to determine the types of buildings and spaces necessary.

Lesson Goals & Assessment Criteria:

Target: Students connect function and design of buildings and/or spaces with the emotion they elicit.

Criteria: Students write emotions associated with building and space visited.

Target: Students determine the needs that a building or space can serve.

Criteria: Students classify and sort the types of buildings into “cultural universal” categories.

Target: Students survey others about their needs in a city and use mathematical tools/strategies to analyze results.

Criteria: Students ask survey questions, tally answers and make conclusions based on responses to survey questions.

Target: Students graphically display results of survey and verbally articulate analysis of the survey.

Criteria: Students create pie charts, bar graphs or other symbolic representations of data to communicate results of survey; present results orally to the class.



Robert Purser

Integrated Subjects:

Math
Social Studies

Suggested Grade Levels:

3rd-5th
(See Lesson Adaptations section for use with Upper and lower grades)

Essential Academic Learning Requirements (EALRS):

Social Studies: History 2.2
Social Studies: Geography 1.1

Social Studies: Geography 3.1

Math 1.4.3

Math 1.4.4

Math 1.4.5

Lesson Duration:

Up to six class periods

MATERIALS:

- paper
- pencils
- tape recorder (for interviews)
- Sample Planning Communities Survey questions (optional)
- Planning Communities Survey Results Chart (optional)
- Check Your Work for Students worksheet
- graph paper
- colored markers
- poster board

THE LESSON:**Suggested Pre-Lessons:**

- Ask students to take notes about what they did over the weekend and all the different places they went and how they got there. You could also discuss various modes of transportation available in Seattle (car, bus, bike, walk, train, ferry, streetcar, monorail, light rail, vanpool, car share). How many can they name?
- Have students identify the neighborhoods where they live and go to school, and then find these neighborhoods on a map.

DAY 1 – Brainstorming About Your Community

Teacher: Guides a brainstorming session about what kinds of places we need in our communities.

Prompts: *Think about what you did over the weekend. What buildings did you use? Your home, the library, the YMCA, the grocery store, your friend's house. Try to remember everything you did and list all the buildings you and your family used.*

How did you get around? Did your parents drive you anywhere; did you take the bus, or ride your bike? Think about the spaces you used, like the street, the sidewalk, parking lots, soccer fields.

Students: Participate in brainstorming by responding from personal experience and writing down responses.

Teacher: Leads students in considering how each of these places made them feel, introducing the idea that cities can be designed not just to fulfill needs but also to elicit feelings.

Prompts: *Where did you feel comfortable? Where did you want to stay for a while and where did you want to leave right away? What made these places feel comfortable or uncomfortable for you? Was it how the places looked, for example? Shows students images of general places they might encounter in their daily lives, such as parking lots, parks, highways, etc.*

Let's look at some examples of specific places in Seattle that have been designed for a lot of people to use. How do you use these places, and how do they make you feel? Shows students images of Seattle Center, Harbor Steps, Fremont, Downtown office buildings.

Students: Write down associated feelings next to the buildings or spaces that they listed in step 1, as well as the places shown in the images.

TEACHER NOTES:

Alan Dodson/SAF

Day Two – Organizing Community Data

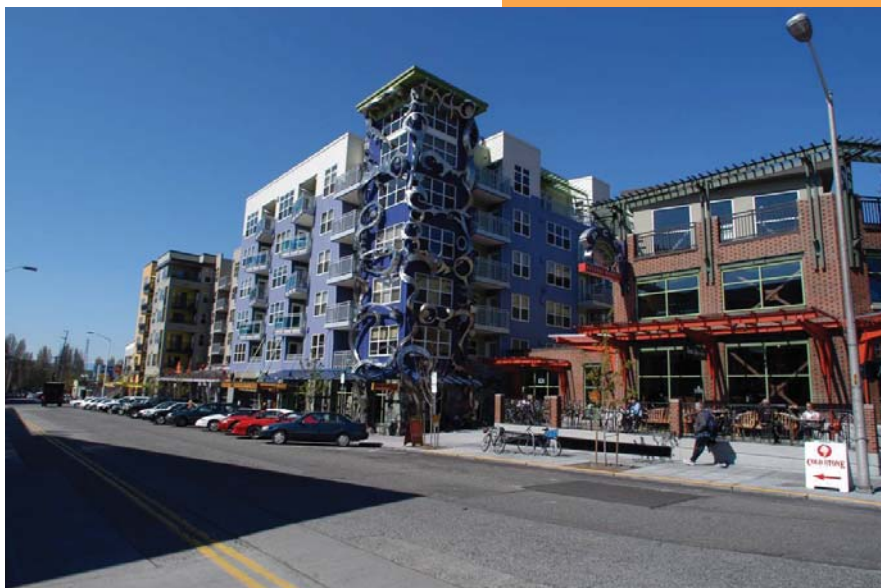
Teacher: Asks students to think beyond just the places they visited over the weekend, including all the different types of places in their neighborhood, and to make an “inventory” of their neighborhood.

Introduces the “cultural universal” list as categories of basic services that every community needs. Provides these categories for the students (Family Life, Jobs, Food, Shopping, Transportation, Government, Safety, Health, Arts, Recreation, and Religion) or leads them in brainstorming what these categories could be. Then hands out blank cards and asks the students to write the names of the places from their neighborhood inventory on one side and the appropriate “cultural universal” categories on the other.

Students: Classify and sort buildings and spaces by “cultural universal” category.

Teacher: Guides the students in creating a bar graph using the cards by lining up all the cards in the same category. This gives students a visual sense of what places currently exist in their neighborhood under each category.

Students: Collect all cards of the same category and line them up one on top of the other. Make an initial analysis of the services that their neighborhood has a lot of (such as shopping) and the services their neighborhood may need more of (such as recreation).



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Day Three – Writing a Community Survey

Teacher: Explains to the students that they have taken the first steps toward being neighborhood planners. They have determined what services their neighborhood currently has to offer. Now they must survey, or ask questions, of other people about what other services they want in their neighborhood. Do the current services fit the needs of the community?

Prompts: *Communities are places used by many different people at many different times. Let's find out what people need in their community by asking questions. Some things that planners consider are how often people use a particular place or a space; how they get to and from that place or space; and whether a place or space is important to them—in other words, could they live without it? Finally, how does this place or space make them feel, comfortable or uncomfortable?*

Models writing questions for each category. (Teachers can use the questions on the Sample Planning Communities Survey worksheet as a model.) Demonstrates developing questions that help students to know the importance of the place or space to the person they are interviewing. Pairs students to have them work on developing questions together.

Prompts: *For example, under the category of “Food”, you might ask if they like to buy food at a grocery store to cook at home, or if they prefer going out to eat in restaurants (or a little of both). How often do they use a grocery store? How do they get there? How do they want to feel when they are in the grocery store? Is it important to them to have more than one grocery store to shop at?*

Students: With partners, develop questions under each category to discover the types of buildings and spaces people would like to use and experience.



Erin Silva/SAF

Day Four – Conducting the Survey in the Community

Teacher: Once survey questions have been written for each category, instructs students to interview at least five students from a different class (arranged with the other teacher in advance) or family members and neighbors.

***Prompts:** When you begin the survey, explain that you are interested in their ideal city, what kinds of buildings and spaces they would like to use and experience, not just what already exists.*



Erin Silva/SAF

Students: Conduct survey.

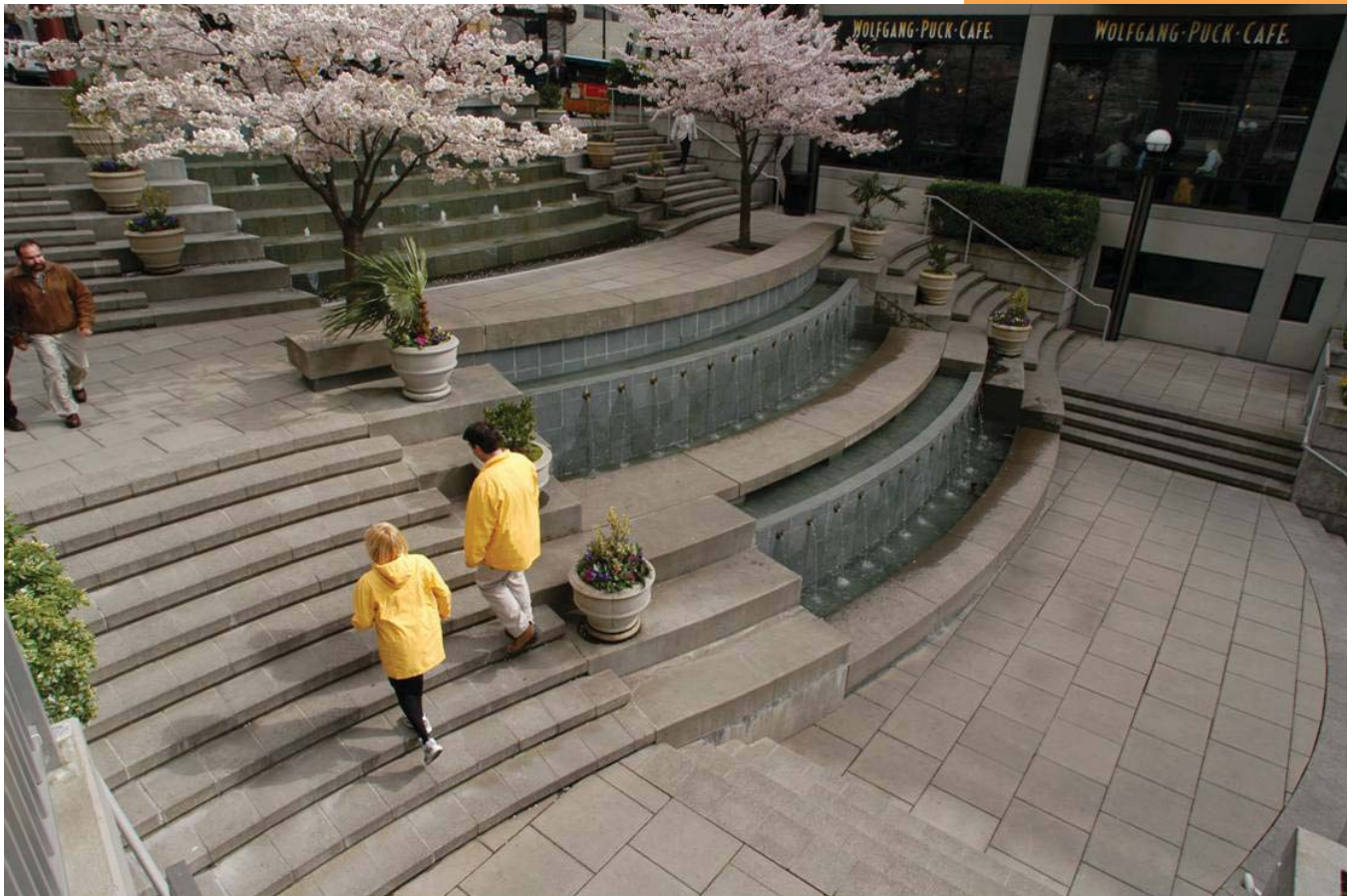
TEACHER NOTES:

Day Five – Organizing and Analyzing Survey Results**TEACHER NOTES:**

Teacher: Guides students in tallying their results. Asks students to look for similar answers in each category and to highlight them.

Prompts: *When answering your questions, people may say similar things but use different words. For example, if you asked about what kinds of places people need for “Food,” one person might have said “restaurant” and someone else “café” - these are similar answers and can go in the same category. If they said “grocery store,” though, that is a place that serves a different function from a “restaurant” and should go in another category. You may want to color code similar answers.*

Students: Organize subcategories and tally the number of answers for each subcategory.



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Day Six – Drawing Conclusions from the Survey Results

Teacher: Facilitates creation of graphs of the information the students have tallied. Demonstrates how to create a horizontal axis that represents the different subcategories of places and a vertical axis that represents the number of answers. (Show example: Planning for Community Survey Results Chart.) Encourage students to be creative and use images that represent the responses on their graphs. For example, to represent the number of people who said parking was needed in their city, use that number of cars instead of graph bar. Ask the students to review the answers and consider how the people felt about each of the places they mentioned.

Prompt: *How do people's needs for particular places correspond to their feelings about the buildings?*

Students: Draw a graph with a horizontal axis representing response sub-categories and a vertical axis representing amount.

Teacher: Guides students in comparing their charts with classmates and drawing conclusions from the data. Asks students to consider the following questions and present their conclusions to the class.

Prompts: *What were the top three types of places that everyone has on their charts? What can that tell us about what people want in their community? If you were to start a city from scratch, what might you build first? Does your community currently have everything that people need, or do you sometimes need to go somewhere else?*

Students: Find similarities and differences between their charts and those of their classmates. Determine how a future city might be planned according to the results presented in their chart.

Teacher: Asks students to take what they have learned from the results of their survey and draw two different versions of the kind of community people are asking for. (See adjacent Creative Solution! on Problem Solving.) For both versions, have the students change one or two aspects. For example, one drawing could include more trees along the street, while another could include a train instead of a street for cars. Then students can conduct a second survey based on responses to the two different pictures.

Students: Draw two different views of the same location in the community based on the survey results. Conduct survey on responses to these views. Complete *Check Your Work for Students* worksheet.

**CREATIVE
SOLUTION
!****Problem Solving**

Having students take the results of the survey and design an ideal community based on that data allows them to bring in their own personal creativity, while working within the expressed needs of the community. By asking students how different places in their community make them feel, you can help them become aware of how the aesthetics of places affect them and why we want to preserve things that make places more pleasant, such as trees along a road, or landscaping in a parking lot. Encourage students to incorporate these elements into their final drawings.

LESSON ADAPTATIONS:

For students grades K – 2

Brainstorming about community: Provide laminated pictures of various standard places and spaces students might encounter, such as parks, parking lots, houses, swimming pools, or shopping malls. Ask them to write or talk about how those places are used, and how they make them feel. You can have the students cut out pictures from magazines of different places and spaces instead of providing them.

Categorizing community needs: Lead the students in categorizing the different types of places and spaces as a class activity.

Asking survey questions: Provide a sample survey form. (Teachers can use the Sample Planning Communities Survey worksheet.) Guide students in filling out the survey themselves and then have them ask two family members to complete the survey.

Presenting results of survey: Students can incorporate the places and spaces that the people they interviewed said were most important into a drawing/plan of their ideal neighborhood.

For students grades 6 – 8

This lesson is applicable to upper grades as well. Some ways to offer students more choice at certain points of the lesson include:

Brainstorming about community: Tell students about the focus of this lesson a week early and ask them to take pictures of a typical day and the different places they use. If cameras are not available, ask students to take notes about where they went and to include details about what the places looked like, how they are used, and how the places or spaces made them feel.

Developing survey questions: Divide the students into teams to develop questions for each category. Guide them to balance between questions that require yes or no answers and questions that are more open-ended.

Presenting results of survey: Offer students choices about how they would like to present the information (a graph, a pie chart or some other visual display). Have them calculate the percentage for each answer to each question and integrate the percentages into their visual display.

SHAPING YOUR COMMUNITY:

- Students can find out about local projects that encourage community involvement by checking in the Help Shape Your Communities sheet.
- They can learn how citizens give feedback about projects, such as attending public meetings or writing to their City or County council members. People can have very different opinions about public projects - as in the case of Seattle's Monorail Initiative or the Alaskan Way Viaduct replacement. Ask students to read newspaper opinion articles, letters to the editor, or ask family and neighbors and then decide what their opinion is on these issues.

ADDITIONAL LESSON OPTIONS:

- Students could contact a city planner to see if any new additions (shopping center, road, public transportation) are being planned for their community and how this addition will fit the needs of the community.
- Consider how students would revise their current neighborhood according to the survey results.
- Create a "Visioning" project by drawing two different pictures of the ideal city and then ask which image people like best. Write stories about the people and their lives in the ideal city they have planned.
- Research the various roles needed to create the different elements of the city, (landscape architects, transportation planners, community activists, businesspeople, etc.). Invite one of these professionals to speak in the classroom.

BACKGROUND INFORMATION:**Harbor Steps**

Located downtown between First and Western Avenues, Harbor Steps is a neighborhood comprising four towers that house apartments, an inn, restaurants, shops, office space and a day care center. The towers surround a large open public space called Harbor Steps Park. This park connects the waterfront to downtown and also offers a community gathering place where residents, locals and visitors can relax. This project helped renovate a part of First Avenue which had become run down in the early 70's.

Fremont

Fremont is a neighborhood that has gone through many changes to fit the shifting needs of its community. Fremont historically has been a crossroads – a place where rail lines, roads and water met. At the turn of the twentieth century, electric street cars connected Fremont with downtown and surrounding Seattle neighborhoods. Then it became a major stop on the Interurban rail line from Seattle to Everett. Today, the center of Fremont is where many cars and pedestrians meet, and you can find a sign post declaring directions to destinations including Noogie (top of the head) to the Bermuda Triangle. Fremont's main industry was originally the Bryant Lumber and Shingle Mill. The town quickly developed with housing, groceries, hardware stores, schools and churches to fill the needs of the mill workers. The site of the town's first saw mill, now the Lake Union Center near the Fremont Bridge, is home to Fremont's newest industry, high technology housing software maker Adobe Systems and Getty Images, a leader in digital imaging.

List of Images

- Downtown Seattle
- Seattle Monorail: Transportation alternative
- Fremont: Neighborhood
- Seattle Waterfront
- Natural Park
- Harbor Steps: Pedestrian walkway

Images for each unit can be found on the SAF website @ www.seattlearchitecture.org

Related Lesson Plans

Comparing Edible Communities, Web Curriculum, Center for Understanding the Built Environment (CUBE), <http://www.cubekc.org/>.

City People, City Stories, Web Curriculum, Center for Understanding the Built Environment (CUBE), <http://www.cubekc.org/>.

Land Use Planning, Seventh Grade Math lesson, Schoolyards to Skylines: Teaching with Chicago's Amazing Architecture. Chicago Architecture Foundation, 2002

Downtown Seattle

Downtown Seattle's first European settlers established farms and a steam mill in the area now known as Pioneer Square. In the mid-1800's, the city was a hub for the lumber and salmon fishing industries. With the arrival of the railroad, downtown grew, but on June 6, 1889, the city center burned to the ground in a great fire. The city was rebuilt quickly with stone and brick instead of wood. With the Klondike Gold Rush, the city prospered by providing services for miners going to Alaska. Seattle eventually grew northward out of Pioneer Square. City engineers leveled steep hills to create building space. Denny Hill was lowered to become the Denny Regrade. The move of the original University of Washington from this area to northeast of downtown allowed for planned development of a new business district.

Into the twentieth century, downtown continued to grow. In 1914, Smith Tower was completed. At 42 stories, it remained the tallest building in the United States west of the Mississippi River until after World War II. After the War, construction projects such as the Alaskan Way Viaduct and Interstate 5 severed the downtown from other neighborhoods. There was also, however, a growing interest in historic preservation. Pioneer Square and Pike Place Market were saved from demolition. Downtown today continues to mix old and new. Smith Tower, Pioneer Square and Pike Place Market remain, while new shops, restaurants, condos and apartments continue to be added. Several cultural organizations such as the Seattle Art Museum and Seattle Symphony have moved downtown, making it a vibrant center for retail, recreation, culture and jobs.

Websites:

Cultural Universals: <http://www.teachtheteachers.org/projects/PWalker2/culture.htm>

http://www.asor.org/outreach/Teachers/History/culture_universals.htm

VOCABULARY:

Analyze – To break into parts for individual study.

Axis – A reference line on a chart.

Chart – A visual form presenting statistical information.

Cultural Universals – Broad categories of needs found in most cultures, such as food, shopping, shelter, family life, jobs, transportation, government, safety, health, arts, recreation, religion.

Demographics – The study of the characteristics of human populations.

Function – The purpose for which something exists.

Graph – A drawing, chart or diagram that shows relationships among a set of things.

Inventory – A detailed, itemized list of goods and materials. The process of making a list of items.

Statistics – The collection, organization, analysis and interpretation of numerical data.

Survey – A series of questions used to gather information on a topic.



Date: _____

Student Name: _____

Scale

- 1 - Well below target
- 2 - Approaching target
- 3 - Meeting Target
- 4 - Exceeding Target

Teachers: Indicate assessment in each target area by circling the number that best describes student's participation.

Personal Response				
Writes emotions associated with buildings and space visited	1	2	3	4
TEACHER'S COMMENTS:				

Categorization				
Classifies and sorts buildings and spaces into "cultural universal" categories	1	2	3	4
Verbally articulates analysis of the survey	1	2	3	4
TEACHER'S COMMENTS:				

Analysis & Presentation				
Surveys, tallies, and makes conclusions based on responses to survey questions	1	2	3	4
Graphically displays survey results	1	2	3	4
TEACHER'S COMMENTS:				

Lesson Goals & Assessment Criteria

Target: Student connects function and design of buildings and/or spaces with the emotions it elicits.

Criteria: Student writes emotions associated with building and space visited.

Target: Student determines the needs that a building or space can serve.

Criteria: Student classifies and sorts the types of buildings into "cultural universal" categories.

Target: Student surveys others about their needs in a city and uses mathematical tools/strategies to analyze results.

Criteria: Student asks survey questions, tallies answers, and makes conclusions based on responses to survey questions.

Target: Student graphically displays results of survey and verbally articulates analysis of the survey.

Criteria: Student creates pie charts, bar graphs, or other symbolic representations of data to communicate results of survey; presents results orally to the class.

CHECK YOUR WORK!

Student Name: _____ Date: _____

Give yourself a check, if you completed the tasks below to the best of your ability.

Did I?



Write about my emotions about buildings and spaces I visited?	
Classify and sort buildings and spaces into “cultural universal” categories?	
Discuss the analysis of the survey with the class?	
Survey, tally, and make conclusions based on responses to survey questions?	
Make a chart or other visual display of the survey results?	
Vote on a decision?	

These tasks were the most challenging for me:



Writing about my emotions about buildings and spaces I visited.	
Classifying and sorting buildings and spaces into “cultural universal” categories.	
Discussing the analysis of the survey with the class.	
Surveying, tallying, and making conclusions based on responses to survey questions.	
Making a chart or other visual display of the survey results.	
Voting on a decision.	

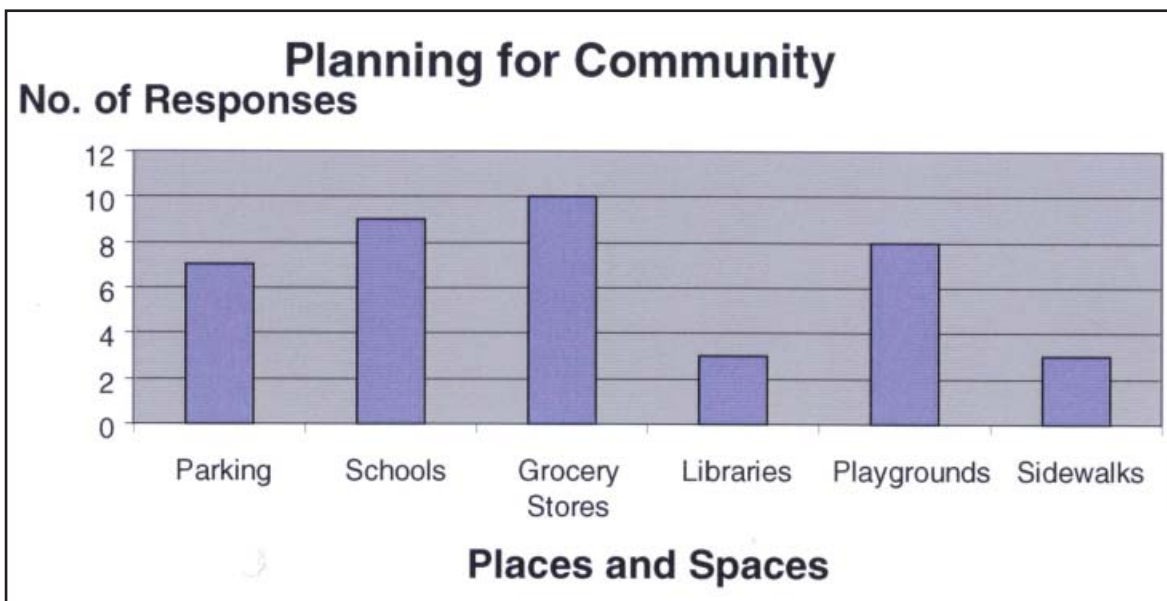
CHECK YOUR WORK! - (continued)

These tasks were easy for me:



Writing about my emotions about buildings and spaces I visited.	
Classifying and sorting buildings and spaces into “cultural universal” categories.	
Discussing the analysis of the survey with the class.	
Surveying, tallying, and making conclusions based on responses to survey questions.	
Making a chart or other visual display of the survey results.	
Voting on a decision.	

Planning Communities Survey Results Chart -EXAMPLE-



Planning Communities Survey

QUESTIONS

Add your own questions & record your answers on a separate page.

Family Life

1. What kind of home does your family live in (apartment, house, condo)?
2. Is your home close to where you work or go to school?
3. How do you feel about where you live, what do you like or dislike?

4. _____

5. _____

6. _____

Jobs

1. Is your workplace near to or far from your home?
2. How do you get to work?
3. Would you want to live closer to or farther away from where you work?

4. _____

5. _____

6. _____

Food

1. Do you prefer to cook at home or go out to eat?
2. How often do you go to the grocery store? What kind of grocery store, big or small?
3. If you tend to eat in restaurants, are they close to or far away from your house?

4. _____

5. _____

6. _____

Planning Communities Survey QUESTIONS - (continued)

Shopping

1. Where does your family like to shop?
2. When you go shopping, do you typically go for a specific item or do you like to browse?
3. Do you like to shop in stores along a street or do you prefer to shop in a mall?
4. How does shopping make you feel?
5. _____
6. _____
7. _____

Transportation

1. What is the main way you get around (car, bus, bicycle, train, walk)?
2. When do you use another way of getting around?
3. How does your main way of transportation make you feel?
4. _____
5. _____
6. _____

Recreation

1. Where do you like to play?
2. Is this place close to or far from your home?
3. How do you get there?
4. Would you like to have more places like this to play or do you feel there are enough?
5. _____
6. _____
7. _____