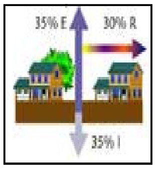


Lesson Plan for Teachers: Applications to the Schoolyard

Objectives: Students will learn to calculate the area of pervious and impervious surfaces in their schoolyard in order to describe the hydro-ecology of their schoolyard, and the impact of its' runoff on the Chesapeake Bay.

Content Standard(s): Please see the "Background" section of the handbook and pick out standards that are appropriate for your grade level.

Read Aloud: Swan Dive: Could our harbor become a haven for recreation? (attached)

Context of Lesson: Students have been learning about schoolyard hydro-ecology, and now get the chance to study their specific schoolyard in detail so that they can describe the movement of water after a rainfall.

Warm Up: If one inch of rain fell on your schoolyard, how many gallons of rain do you think that would be? (think of a gallon in terms of a gallon of milk, if you need help seeing this in your head)

Background information: see attached

Materials:

1. metric conversions sheet (1 per group)
2. Data Sheet (1 per group)
3. Schoolyard Hydrology Study (either the outside version or the inside version, one per group
4. ** materials for the study will depend on which version you are doing – please see the study write-up (attached) for more information

Activities:

1. Students take 5 minutes to complete the warm up, and the teacher reviews the objectives for the day with them.
2. Discuss warm-up results, write on chart paper to use later in the week once we actually get all the measurements made and calculations finished for the study
3. Introduce the study (either the outside version or the inside version)
    a. explain that we are trying to figure out how much rainfall the schoolyard gets during a 1" rain, and also where that water goes after the rain falls.
    b. Describe the activity in detail while looking at the procedure with students so they have a clear understanding of expectations – you may want to break the lab up into multiple parts so that the class stays focused on the task at hand.
4. Go outside (or stay inside, depending on the study)
5. Wrap up/review objective.

Homework: write a letter to someone who lives near the school explaining the importance of increasing the amount of pervious surfaces on the schoolyard, and how that could help the hydro-ecology of the area.

Extensions:
Graphing Exercise 1: Baltimore Public School Cover Data
Graphing Extensions
3-city comparative information (see attached)

Handout for Students: Swan Dive - reading

Swan Dive: *Could our harbor become a haven for recreation?*

By Tom Waldron (www.urbanitebaltimore.com June 2005)

The Baltimore waterfront is 52 miles long, a mostly golden ribbon curling around 7 square miles of water.

Million-dollar condos rise along the dark water, kayakers cross it to work in rehabbed warehouses, and weekend sailors sip martinis at bars overlooking the fantastic, mesmerizing maritime landscape.

But there is one thing missing from the picture. Nobody is actually going in the water. Swimming in the Baltimore harbor is simply not done. Our economic goldmine, it seems, is toxic.

Feel free to take a picture of the sailboats, and enjoy that water taxi ride, but, please, do not go in the stuff.

The Baltimore harbor has been trashed, polluted, and fouled by sewage for so long that the notion of using it for swimming remains remote to most of us. But, perhaps it does not have to be like that. What would we have to do to clean up the harbor water enough to allow swimming?

“It would take a lot of money and a lot of time,” says Beth McGee, Maryland senior scientist for the Chesapeake Bay Foundation.

To be slightly more precise, it would require at least $1 billion in capital improvements and possibly hundreds of millions of dollars more in enforcement, education, and other clean-up activities. Under the most optimistic scenario, it would take a decade.

But it was just a few years ago that city leaders seriously considered making a harbor cleanup a priority. Working with Washington, D.C., to land the 2012 Olympic games, the city proposed holding the Olympic triathlon in Baltimore, with the swimming leg to be held in the Inner Harbor.

“We wanted to clean up the Inner Harbor so that it would be swimmable,” says Clarence Bishop, the chief of staff to Mayor Martin O’Malley, and a one-time senior vice president for the regional Olympics organization. This group did not make specific plans for a cleanup, but did ask environmental scientists if the Inner Harbor triathlon scenario was feasible, Bishop says. The answer was, yes, that by 2012 the harbor could, at least in theory, be clean enough for swimming.

“It was a blue-sky idea, but we were operating on the theory that if you were going to have the Olympics, anything is possible,” Bishop says.

Indeed, anything is possible, even cleaning up the harbor.

“It could happen if we set priorities,” says Phil Lee, a waterfront engineer who is working as a volunteer on a major cleanup project in the harbor.

But, first, just how bad is the water?

“I heard you have to get your stomach pumped immediately after you go in the harbor,” offered one city employee who helps market Baltimore.

The truth is not quite so dramatic. The Baltimore police informally urge anyone who falls into the harbor to take a hot shower—and use plenty of soap. And drinking any of the water would be a bad idea.

There are three main problems. First, there’s the sewage.

Congress passed the Clean Water Act in 1972 to clean up the nation’s waterways, including the Baltimore harbor. In the more than three decades since, the city has never been in compliance, due in large part to the city’s aging sewer lines—more than 3,000 miles in all—that were first installed in the early years of the twentieth century. Connecting the pipe segments are more than a million seals that can leak sewage, which often drains into streams or storm sewers. During a heavy rain, the system is designed to divert raw sewage into the storm water system, which, of course, empties out into the harbor.

Under pressure from the federal government, the city of Baltimore signed a consent decree in 2002 requiring the city to make nearly a billion dollars’ worth of improvements in its sewer system over the next decade. Water and sewer fees have gone up significantly for city residents in the last few years to help pay for the overhaul and work is ongoing. The results could be dramatic, but will take years.

Second, the harbor holds the residue of decades of industrial activity, tons of potentially harmful chemicals resting in the sediment beneath the water.

For the Chesapeake Bay, it’s a blessing that many of these chemicals remain buried in our harbor, limiting the environmental degradation elsewhere. Of course, that’s not much comfort to those interested in improving the harbor water.

The harbor could be dredged, removing much of the contaminated sediment. There are no firm estimates for how much that would cost, but it would be expensive. A project to dredge hundreds of tons of sediment laced with chemical contaminants known as PCBs from the Hudson River in New York State will cost at least a half-billion dollars. And disposing of the Baltimore harbor’s polluted gunk would pose a major challenge.

Another option is to leave the sediment undisturbed, but ensure that future runoff is less contaminated. Over time, this cleaner sediment will create a natural barrier, minimizing the release of chemicals into the water. That approach, while less expensive, would require stricter enforcement of industrial pollution laws, and a broad education campaign to get residents throughout the watershed to avoid, for example, using excessive fertilizer on their lawns or dumping old automobile oil in the storm drains.

Finally, there’s the trash. Walk along the Canton waterfront or out on the marina docks among the expensive pleasure craft and you will find a colorful assortment of garbage—potato chip bags, empty soda bottles, candy wrappers, countless cigarette butts, and a seemingly timeless collection of Styrofoam in various stages of disintegration. Lurking just underneath the surface are semi-buoyant hypodermic needles, discarded by junkies into gutters and sewers.

Dr. John J. Dowling, a retired public health officer from Long Island who moved with his wife into a condominium in Canton in 2001, could scarcely believe the amount of trash that accumulated on the shore, particularly after a big rain.

"I remember thinking, 'What can we do to get rid of that stuff?' It's an eyesore and a nuisance," Dowling says.

People in Baltimore, he figures, are too disconnected from the harbor and simply do not realize—or care—that the trash they throw into the gutter inevitably ends up in the water.

Working with Lee, a longtime community activist, Dowling is head of the Baltimore Harbor Watershed Association, a group of environmental activists and harbor residents. One of the association's key goals is to have the city install giant nets across the openings of some two dozen outfalls—including streams and storm sewers—that flow into the Inner Harbor, depositing tons of trash.

The nets would strain out trash, and crews using cranes and dump trucks would empty them every couple of weeks. It would be a multimillion-dollar project, but one that could dramatically improve the visual appeal of the water.

Swimming in Baltimore's water used to be common. Old-timers recall diving off Fells Point piers. Sandy beaches and public bathhouses in Middle Branch were hugely popular in the late nineteenth and early twentieth centuries. And across the harbor, into the 1920s, the Maryland Swimming Club in Dundalk did a fine business where the marine terminal now operates.

Swimming came and went in other cities as well. But some have done something about it. In New York City, the rivers are once again clean enough to allow for swimming, including a series of races and distance events sponsored by the Manhattan Island Foundation. The water is safe, although the foundation does warn swimmers that "there may be random jetsam and flotsam in the waterways."

Swimming is common at beaches in Boston Harbor, which has been the focus of a major cleanup effort since 1985.

Improvement in the water quality in Boston and New York did not take place by accident. In both cases, committed advocacy groups forced the issue and won support from key politicians, who delivered government funding.

Could Baltimore follow the lead of Boston, New York, and other cities, such as Tacoma, Washington, attempting to clean up their harbors? Clearly, it won't happen here unless the people insist on it.

The hardest task might be convincing Baltimoreans to readjust their conception of the harbor. Can we embrace the primal need to be in the water, not just beside it?

Imagine the possibilities if the water were someday clean enough for swimmers.

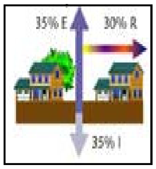
Why couldn't we redesign the harbor bulkhead near Rash Field to create a swimming area, complete with slides and swings? How about creating a sandy beach for families on the Middle Branch, complete with lifeguards and hot dog stands? Or contemplate the buzzing social scene that would emerge at a new Canton Beach, with a salsa band providing the soundtrack from a waterfront bandstand?

We can dream, but others will not wait. Once the weather heats up, there will be a few brave souls—mostly kids—who will dive into the harbor, perhaps in Canton or Locust Point, oblivious to the potential dangers (or the fact that harbor swimming is officially prohibited by the City).

Joe Stewart, a Waverly resident who has made four annual swims across the mouth of the Patapsco River to raise money for environmental groups, wanted to move last year's event closer to Baltimore to have it end at Fort McHenry. He gave up the idea after receiving a strongly worded memo from state environmental officials about the health risks.

But Stewart still looks longingly at the urban swimming going on in New York and elsewhere. "There's no reason that wouldn't happen here if we gave it high enough priority," he says.

Want Baltimore to become a swimming city? Should we make water clean-up a priority? Let us know at mail@urbanitebaltimore.com.



Lesson for Students: School Grounds Water Budget – The Outside Version

Source: Alan Berkowitz, Institute of Ecosystem Studies
Jessica Saven, Baltimore City Public Schools

Curriculum Links:
1. Calculate the area of different segments of the schoolyard
2. Analyze the impact of humans on the environment

Questions:
1. How much water enters our schoolyard ecosystem In a 1" rain?
2. What happens to the water that enters our schoolyard ecosystem following a 1" rain?
3. What determines the fate of water entering our schoolyard ecosystem?

Overview: In this study, you will explore the entire schoolyard ecosystem and figure out how much water enters different areas or parts of the ecosystem in a 1" rainfall. This will require surveying the schoolyard, identifying the different types of land cover or surfaces that might hold or transmit water differently, and then measuring these areas to come up with a budget of the amounts of water entering each part of the schoolyard. Then, each surface or cover type will be examined to figure out where water will go next and what determines these pathways.

Materials: (per group of 3-5)
- Clipboard, paper, pencil or pen
- Ball of strong string
- Long meter tape (30-50m)
- Compass
- protractor
- calculator

Procedure:

1. **Make a preliminary survey and sketch of the school grounds**
    a. Get a sense for the overall size of the school property by pacing the perimeter: have one group member measure how long their pace is (from heel to heel) and then walk with that same pace along both edges of the schoolyard. Add up all of the measurements, and record on the data sheet
    b. While one person is pacing, have the rest of the group members make a list on your data sheet of the different types of land surfaces you see on the schoolyard. Try to identify surfaces that you think will hold or transmit water differently (pervious and impervious surfaces)
    c. Come up with different categories for the land covers (for example: vegetation, cement and asphalt, etc) and record that on the data sheet
    d. Create a simple sketch of the school property showing the boundaries of each patch of each different type of land cover or surface
2. **Measure the area of each category of land cover on the school grounds**
    a. Measure the dimensions of every patch of each category (give them a name so you keep them straight, and label the name on the sketch you made: for example: asphalt 1, asphalt 2)
    b. Record the dimensions of each patch, either on your map or on a data sheet you create
3. **Examine each patch of each cover type, and determine where the water will go once the rain falls on that patch**
    a. Look for pathways of water flow: pipes, drains, holes, cracks, etc.
    b. Look for evidence of past water flow: rivulets, wet spots, channels, etc

c. Record proposed pathways on the map or on your data sheet (if doing this on the map, draw arrows, if doing this on a data sheet, describe where the water will go in words)

4. **Calculate the water input budget for whole school grounds and each cover type:**
   a. Calculate the area of all of the patches of each cover or surface you identified
   b. Calculate the amount of water represented by a 1" rainfall hitting each of these total areas
   c. Record these amounts on the data table.
5. **Speculate on the fate of the water input for each cover type**
   a. Think about the most common next steps in the movement of water once it has entered the schoolyard ecosystem (where does it go after it rains?)
   b. Estimate the amount of water moving along each of these steps from each major cover type on the schoolyard
   c. Record your speculations in the data table
6. **Present your results to the rest of the group!**

Data Sheet: *School Grounds Water Budget*

1. Perimeter of the schoolyard:_____________

2. Types of land cover observed on the schoolyard:

3. Categories our team is using for the project:
   - A:
   - B:
   - C:
   - D:
   - E:

Schoolyard DATA SHEET 1:

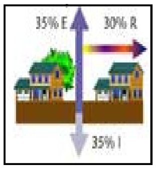
Cover Type	Patch #	Dimensions (m)	Area (m^2)	Direction of Water Flow

Schoolyard Data Sheet 2:

Cover Type	Total Area (m^2)	Amount of Water during 1" rainfall
Whole schoolyard		

Speculations About the Movement of Water:

Most common next steps for the movement of water after rainfall	Estimated amount of water (of the 1" of rain) that would go on this path



Handout for Students: Conversions for Water Budget

How to Convert Units:

To calculate the rainfall….

You already know you have 1" of rain on the schoolyard.

1 inch is the same as 2.54 centimeters.

The total area of the schoolyard is ____________________(m^2)

Because there are 100cm in 1 meter, divide the 2.54cm by 100 before you multiply it by the area of the schoolyard, so the answer stays in meters.

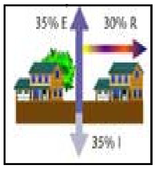
2.54 / 100 = 0.0_ _ _ m

__________ x _________ = _______________ m^3

m of rain	area of schoolyard	total volume of rain

BONUS!!!

If you want to put this in perspective for yourself, One gallon is equal to 3.7854×10^{-3} m^3. (If you haven't learned scientific notation yet, that means .0037854 m^3) You know what one gallon of milk looks like, so if you divide the total volume of rain in m^3 by .0037854, you will end up with the volume of rain in gallons. Try it below!



Lesson for Students: School Grounds Water Budget – The Inside Version

Source: Alan Berkowitz, Institute of Ecosystem Studies
Jessica Saven, Baltimore City Public Schools

Curriculum Links:
1. Calculate the area of different segments of the schoolyard using maps
2. Analyze the impact of humans on the environment

Questions:
1. How much water enters our schoolyard ecosystem In a 1" rain?
2. What happens to the water that enters our schoolyard ecosystem following a 1" rain?
3. What determines the fate of water entering our schoolyard ecosystem?

Overview: In this study, you will explore maps of the schoolyard ecosystem and figure out how much water enters different areas or parts of the ecosystem in a 1" rainfall. This will require identifying the different types of land cover or surfaces that might hold or transmit water differently on the map, and then measuring these areas to come up with a budget of the amounts of water entering each part of the schoolyard. Then, each surface or cover type will be examined to figure out where water will go next and what determines these pathways.

Materials: (per group of 3-5)
- paper, pencil or pen
- Map of the schoolyard (photocopy that can be written on, or else nice copy and an overhead to put over it and write on)
- Ruler (cm)
- protractor

- Compass
- Calculator
- Highlighters or markers to label different portions of the map

Procedure:

6. **Make a preliminary survey and sketch of the school grounds**
    a. Get a sense for the overall size of the school property by measuring the perimeter: Using centimeters, record the measurements for the schoolyard, and convert them into meters using the scale on the map. Add up all of the measurements, and record on the data sheet
    b. Make a list on your data sheet of the different types of land surfaces you see on the map of the schoolyard. Try to identify surfaces that you think will hold or transmit water differently (pervious and impervious surfaces). You will have to use your memory for some of this.
    c. Come up with different categories for the land covers (for example: vegetation, cement and asphalt, etc) and record that on the data sheet
    d. Create a simple sketch of the school property showing the boundaries of each patch of each different type of land cover or surface
7. **Measure the area of each category of land cover on the school grounds**
    a. Measure the dimensions of every patch of each category (give them a name so you keep them straight, and label the name on the sketch you made: for example: asphalt 1, asphalt 2) on the map, and convert them to meters.
    b. Record the dimensions of each patch, either on your map or on a data sheet you create
8. **Examine each patch of each cover type, and determine where the water will go once the rain falls on that patch**

a. Look for pathways of water flow: pipes, drains, holes, cracks, etc. Use your memory of what the schoolyard looks like to help you with this.
b. Look for evidence of past water flow: rivulets, wet spots, channels, etc
c. Record proposed pathways on the map or on your data sheet (if doing this on the map, draw arrows, if doing this on a data sheet, describe where the water will go in words)

9. **Calculate the water input budget for whole school grounds and each cover type:**
   a. Calculate the area of all of the patches of each cover or surface you identified
   b. Calculate the amount of water represented by a 1″ rainfall hitting each of these total areas (USE METRIC CONVERSION SHEET FOR HELP)
   c. Record these amounts on the data table.
10. **Speculate on the fate of the water input for each cover type**
   a. Think about the most common next steps in the movement of water once it has entered the schoolyard ecosystem (where does it go after it rains?)
   b. Estimate the amount of water moving along each of these steps from each major cover type on the schoolyard
   c. Record your speculations in the data table

6. **Present your results to the rest of the group!**

Lesson for Students: Graphing Schoolyard Data - Worksheet

Name:___________________________________

1. Make a list of all of up to 9 different schools in Baltimore that you know the name of in the table below.

School Name	Green-ness Rank	% Green

2. On the same list you made above, rank the schools from least green to most green (one being least green). You may not have seen the schools, but take a guess which ones you think have the highest percentage of vegetation on their schoolyards.

3. Now, using the Baltimore City Public Schoolls Cover Data tables, calculate and record the percentage of % green of each schoolyard. To do this, divide the Acres of Vegetation by the Total Property Acres.

4. Present your findings in a bar graph (schools on the x-axis, % vegetation on the y-axis) and write a summary below your graph explaining whether or not the results you found support your original ideas about how green different schoolyards were.

Lesson for Students: Baltimore City Public Schools Cover - Data Tables

Baltimore City Public Schools Cover Data:

(All measurements are in Acres)

School	Area of Each Cover Type (acres)				
	Property	Building	Schoolyard	Vegetation	Asphalt
Abbottston Elementary	36.2	3.7	32.5	23.3	7.4
Alexander Hamilton Elementary	3.5	0.5	3.0	2.3	0.7
Arlington Elementary	7.2	0.7	6.5	4.3	2.2
Armistead Gardens Elementary	8.9	1.1	7.9	6.0	1.9
Arnett J. Brown, Jr Middle	21.5	2.8	18.7	14.5	4.1
Arundel Elementary	6.5	0.9	5.5	3.3	1.8
Ashburton Elementary	3.9	1.0	2.9	1.6	1.0
Barclay Elementary/Middle	2.7	0.7	2.0	0.5	1.5
Beechfield Elementary	7.1	1.5	5.7	2.7	2.2
Belmont Elementary	3.7	0.8	2.9	1.2	1.0
Benjamin Franklin Middle	7.8	1.8	6.0	1.4	4.6
Bentalou Elementary	6.3	1.1	5.3	3.0	1.9
Booker T. Washington Middle	1.8	1.3	0.5	0.1	0.4
Brehms Lane Elementary	5.3	0.7	4.6	1.7	2.6
Callaway Elementary	4.1	1.4	2.7	1.8	0.9
Calverton Middle	13.5	4.1	9.4	3.6	5.9
Calvin Rodwell Elementary	3.3	0.4	2.9	2.2	0.5
Canton Middle	2.4	1.0	1.4	0.0	1.4
Carver Vocational-Technical Senior High	13.0	2.4	10.6	7.4	3.2
Cecil Elementary	3.0	1.0	2.0	0.7	1.3
Charles Carroll Barrister Elementary	1.5	0.6	0.9	0.4	0.4
Charles Carroll of Carrollton Elementary	2.9	1.6	1.3	0.1	1.2
Cherry Hill Elementary	11.2	1.5	9.8	4.5	4.9
Chinquapin Middle	13.4	1.9	11.4	9.4	1.8
City Springs Elementary	3.1	0.9	2.2	0.7	1.5
Claremont Special Ed.	8.6	1.9	6.7	4.5	1.6
Coldstream Park Elementary	12.7	1.7	11.1	6.2	4.5
Collington Square Elementary	3.2	1.2	2.0	1.3	0.8
Commodore John Rodgers Elementary	3.1	1.0	2.1	0.7	1.3
Cross Country Elementary	4.2	1.0	3.2	1.3	1.7
Curtis Bay Elementary	6.3	1.0	5.3	3.1	1.9
Dallas F. Nicholas, Sr Elementary	2.3	0.6	1.7	0.9	0.8
Dickey Hill Elementary	7.2	0.9	6.3	3.6	1.9
Diggs-Johnson Middle	2.9	1.2	1.7	0.5	1.1
Dr. Bernard Harris, Sr Elementary	2.4	0.9	1.5	0.3	1.2
Dr. Martin Luther King, Jr Elementary	6.5	0.9	5.7	3.8	1.1
Dr. Rayner Browne Elementary	3.7	0.6	3.2	2.4	0.7
Edgecombe Circle Elementary	7.8	2.2	5.6	3.6	2.4

School	Area of Each Cover Type (acres)				
	Property	Building	Schoolyard	Vegetation	Asphalt
Edgewood Elementary	2.9	0.9	2.1	1.0	0.9
Edmondson/Westside Senior High	26.2	2.4	23.8	17.9	2.9
Elmer A. Henderson Elementary	2.3	0.8	1.5	0.9	0.6
Eutaw-Marshburn Elementary	3.6	1.5	2.1	0.7	1.5
Fairmount-Harford Institute Alt. Learning Center	3.9	1.1	2.8	1.1	1.7
Fallstaff Middle	4.3	1.5	2.8	1.2	1.6
Federal Hill Elementary	2.9	1.0	1.9	1.0	0.9
Forest Park Senior High	12.6	1.5	11.1	8.6	2.3
Fort Worthington Elementary	3.2	1.1	2.1	0.1	2.1
Francis M. Wood Alternative Learning Center	2.5	0.6	1.9	1.4	0.5
Francis Scott Key Elementary/Middle	6.0	1.2	4.8	3.2	1.6
Frankford Elementary	11.8	1.0	10.8	7.4	2.5
Franklin Square Elementary	3.4	0.9	2.6	0.4	2.3
Frederick Douglass Senior High	26.3	2.3	24.0	18.7	4.3
Frederick Elementary	3.8	0.5	3.2	2.5	0.7
Furley Elementary	6.6	1.5	5.1	3.9	0.9
Furman L. Templeton Elementary	1.1	0.5	0.6	0.2	0.5
Gardenville Elementary	2.3	0.5	1.8	1.2	0.6
Garrett Heights Elementary	6.6	0.8	5.8	3.7	1.5
Garrison Middle	11.5	1.7	9.8	7.3	2.0
General Wolfe Elementary	0.4	0.3	0.2	0.0	0.2
George G. Kelson Elementary	0.2	0.1	0.2	0.0	0.1
George Street Elementary	3.1	0.9	2.2	0.1	2.1
George W. F.McMechen Middle-Senior	7.4	2.0	5.4	3.6	1.0
George Washington Elementary	0.7	0.5	0.3		0.3
Gilmor Elementary	3.5	1.1	2.4	0.6	1.9
Glenmount Elementary	7.8	1.1	6.7	4.6	1.5
Govans Elementary	3.5	0.6	2.9	0.9	2.0
Graceland Park-O'Donnell Heights Elementary	8.6	0.8	7.8	6.7	1.0
Greenspring Middle	18.5	2.3	16.2	7.3	4.9
Grove Park Elementary	5.2	1.2	3.9	2.3	1.1
Guilford Elementary	4.9	1.2	3.6	1.9	1.6
Hamilton Elementary/Middle	3.8	0.4	3.4	0.7	2.6
Hamilton Middle	5.5	1.5	4.0	1.0	2.9
Hampden Elementary	2.0	0.8	1.2	0.3	1.0
Hampstead Hill Elementary	1.0	0.5	0.5	0.1	0.4
Harbor City Learning Center Alt. Learning Ctr.	6.3	0.7	5.6	3.3	1.8
Harbor View Special E.	10.7	0.9	9.8	8.3	1.4
Harford Heights Elementary	12.7	2.6	10.1	6.4	3.8
Harlem Park Elementary	13.3	4.7	8.7	3.7	5.0
Harriet Tubman Elementary	1.4	0.6	0.8	0.3	0.5
Hazelwood Elementary/Middle	8.9	1.1	7.8	5.4	1.9
Highlandtown Elementary	2.7	0.7	2.0	1.9	0.7
Highlandtown Elementary	0.6	0.7	-0.2	1.9	0.7
Highlandtown Middle	1.2	1.1	0.0		0.0
Hilton Elementary	3.3	1.0	2.3	0.8	1.5
Holabird Elementary	5.9	0.9	5.1	3.3	1.7
James McHenry Elementary	3.1	1.2	1.9	0.3	1.6
James Mosher Elementary	5.9	0.9	5.0	3.8	1.3

School	Area of Each Cover Type (acres)				
	Property	Building	Schoolyard	Vegetation	Asphalt
John Eager Howard Elementary	4.6	1.5	3.1	1.0	2.0
John Ruhrah Elementary	5.0	0.5	4.5	2.1	2.5
Johns Hopkins Hospital Instructional Cen	19.7	12.9	6.8	2.9	3.9
Johnston Square Elementary	2.6	1.2	1.4	0.4	1.0
Joseph C. Briscoe Special Ed.	7.3	2.4	4.9	3.0	1.9
Kennedy Krieger Institute Hospital School	0.7	0.7	0.0		0.0
Lafayette Elementary	3.4	1.0	2.4	0.6	1.9
Lake Clifton/Eastern Senior High	45.0	5.0	40.0	26.5	11.1
Lakeland Elementary/Middle	7.6	1.3	6.2	3.1	3.2
Lakewood Elementary	1.0	0.3	0.6	0.1	0.6
Langston Hughes Elementary	2.7	0.6	2.2	1.5	0.7
Laurence G. Paquin Middle-Senior Senior High	2.2	0.7	1.6	0.6	0.7
Leith Walk Elementary	7.4	1.2	6.2	3.9	2.0
Lexington Terrace Elementary	2.3	0.9	1.3	1.3	0.8
Liberty Elementary	3.7	0.8	2.9	1.8	1.0
Lillie M. Jackson Special Ed.	4.6	0.5	4.1	3.2	0.8
Lockerman-Bundy Elementary	1.6	0.7	0.9	0.2	0.7
Lois T. Murray Special Ed.	1.5	0.5	1.0	0.4	0.5
Lombard Middle	4.9	2.9	2.1	0.4	2.0
Luther C. Mitchell Primary Elementary	0.4	0.1	0.2	0.1	0.2
Lyndhurst Elementary	6.3	1.2	5.1	2.0	2.1
Madison Square Elementary	2.6	1.2	1.5	0.4	1.1
Malcolm X Primary Elementary	1.6	0.5	1.1	0.6	0.4
Maree Garnett Farring Elementary	1.5	0.5	0.9	0.5	0.5
Margaret Brent Elementary	0.0	0.0	0.0	0.0	0.0
Mary E. Rodman Elementary	1.4	0.8	0.6	0.2	0.4
Maryland Youth Residence Alt. Learning Center	3.2	0.2	3.0	1.9	0.5
Matthew A. Henson Elementary	2.8	1.0	1.8	0.2	1.6
Medfield Heights Elementary	3.6	1.1	2.5	1.5	1.0
Mergenthaler Vocational-Technical Senior High	16.5	3.1	13.4	3.5	10.0
Mildred Monroe Elementary	1.7	0.8	0.9	0.1	0.8
Montebello Elementary	8.4	0.7	7.7	4.6	2.7
Montebello Hospital Instructional Center Hospital	20.2	2.2	18.0	6.7	10.6
Moravia Park Primary Elementary	5.7	1.5	4.2	2.8	1.6
Morrell Park Elementary	4.5	1.2	3.3	1.9	1.0
Mt. Royal Elementary/Middle	2.8	1.2	1.6	0.4	1.2
Mt. Washington Elementary	1.0	0.4	0.6	0.3	0.2
Mt. Washington Hospital School Hospital School	22.3	1.0	21.3	7.1	1.8
North Bend Elementary	1.2	0.2	1.0	0.6	0.3
Northeast Middle	12.0	1.4	10.6	6.5	1.3
Northern Senior High	15.6	3.5	12.1	9.2	2.9
Northwestern Senior High	16.2	2.4	13.7	9.6	3.3
Northwood Elementary	13.2	1.5	11.7	8.2	3.0
Park Heights Elementary	3.0	0.7	2.3	1.5	0.8
Patterson Senior High	32.5	4.7	27.8	20.1	6.9
Paul Laurence Dunbar Middle	2.5	0.8	1.7	0.5	1.2
Paul Laurence Dunbar Senior High	7.5	2.7	4.8	1.8	2.9
Pimlico Elementary	6.9	2.0	4.9	2.5	2.3
Pimlico Middle	18.9	2.2	16.8	11.9	4.3

School	Area of Each Cover Type (acres)				
	Property	Building	Schoolyard	Vegetation	Asphalt
Robert Poole Middle	6.1	1.2	4.9	2.3	2.5
Robert W. Coleman Elementary	3.1	0.6	2.6	1.6	0.9
Rognel Heights Elementary	2.9	1.0	1.9	0.9	1.0
Roland Park Elementary/Middle	7.6	1.5	6.1	2.8	1.8
Rosemont Elementary	1.7	0.7	1.0	0.5	0.6
Samuel F. B.Morse Elementary	1.4	0.7	0.7		0.7
Sarah M. Roach Elementary	2.9	0.6	2.2	1.5	0.7
School for the Arts Senior High	0.6	0.6	0.0		0.0
Sharp-Leadenhall Special Ed.	1.5	0.5	1.1	0.6	0.5
Sinclair Lane Elementary	6.4	0.8	5.6	4.1	1.5
Southeast Middle	9.8	1.8	8.0	4.7	1.1
Southern Senior High	6.8	2.2	4.7	2.6	2.0
Southwestern Senior High	0.1				
Stadium School Elementary	7.2	2.8	4.4	2.4	2.0
Steuart Hill Elementary	2.3	0.6	1.7	0.8	0.9
Tench Tilghmann Elementary	0.9	0.6	0.2	0.0	0.2
The Upton School Home and Hosptial Service	1.0	0.1	0.9	0.6	0.3
Thomas G. Hayes Elementary	2.3	1.0	1.3	0.3	1.0
Thomas Jefferson Elementary	6.9	0.9	6.0	4.7	1.0
Thomas Johnson Elementary	2.8	0.9	1.9	0.6	1.3
University Hospital Transitional Hospital School	5.8	4.2	1.6	0.0	1.6
Venable Senior Special Ed.	0.9	0.5	0.5	0.2	0.3
Violetville Elementary	5.2	1.0	4.2	3.1	1.0
Walbrook Senior High	13.3	3.0	10.3	6.5	2.9
Walter P. Carter Elementary	8.0	1.2	6.8	4.8	1.3
Walter P. Carter Hospital School Hospital School	1.6	1.2	0.4	0.2	0.3
Waverly Elementary	3.3	0.8	2.5	1.8	0.5
West Baltimore Middle	26.8	3.7	23.1	17.6	5.1
Western/Baltimore Polytechnic Institute	51.0	10.5	40.5	28.4	12.0
Westport Elementary	6.2	0.9	5.4	3.6	1.7
Westside Elementary	2.8	0.8	2.0	1.1	1.0
William H. Lemmel Middle	33.2	3.6	29.6	22.3	4.3
William Paca Elementary	1.1	0.5	0.6	0.1	0.6
William Pinderhughes Elementary	3.6	0.6	3.0	2.1	1.0
William S. Baer Special Ed.	5.8	1.7	4.0	2.4	1.1
Windsor Hills Elementary	5.7	0.4	5.2	3.0	0.9
Winston Middle	7.3	1.6	5.7	3.1	1.4
Woodbourne Day School at Thurgood Marshall	33.8	4.4	29.3	18.9	7.0
Woodhome Elementary	6.1	1.8	4.3	2.3	1.0
Yorkwood Elementary	8.0	1.3	6.7	3.4	2.1

Background for Teachers: Baltimore City Public Schools Cover - Data Tables with % Green

The following pages are an expanded version of the data given to your students, including the % Vegetation at each of the schools, which they calculated and graphed in the previous assignment. Use this as a starting point to create future assignments, and also to check their work finding the % vegetated area for each of the schools.

Baltimore City Public Schools Cover Data:

(All measurements are in Acres)

	Area of Each Cover Type (acres)					%
School	Property	Building	Schoolyard	Vegetation	Asphalt	green
Abbottston Elementary	36.2	3.7	32.5	23.3	7.4	64.3%
Alexander Hamilton Elementary	3.5	0.5	3.0	2.3	0.7	65.4%
Arlington Elementary	7.2	0.7	6.5	4.3	2.2	59.4%
Armistead Gardens Elementary	8.9	1.1	7.9	6.0	1.9	66.6%
Arnett J. Brown, Jr Middle	21.5	2.8	18.7	14.5	4.1	67.3%
Arundel Elementary	6.5	0.9	5.5	3.3	1.8	51.7%
Ashburton Elementary	3.9	1.0	2.9	1.6	1.0	40.5%
Barclay Elementary/Middle	2.7	0.7	2.0	0.5	1.5	17.7%
Beechfield Elementary	7.1	1.5	5.7	2.7	2.2	38.4%
Belmont Elementary	3.7	0.8	2.9	1.2	1.0	32.5%
Benjamin Franklin Middle	7.8	1.8	6.0	1.4	4.6	18.3%
Bentalou Elementary	6.3	1.1	5.3	3.0	1.9	48.0%
Booker T. Washington Middle	1.8	1.3	0.5	0.1	0.4	7.1%
Brehms Lane Elementary	5.3	0.7	4.6	1.7	2.6	32.0%
Callaway Elementary	4.1	1.4	2.7	1.8	0.9	45.2%
Calverton Middle	13.5	4.1	9.4	3.6	5.9	26.4%
Calvin Rodwell Elementary	3.3	0.4	2.9	2.2	0.5	66.1%
Canton Middle	2.4	1.0	1.4	0.0	1.4	0.5%
Carver Vocational-Technical Senior High	13.0	2.4	10.6	7.4	3.2	57.0%
Cecil Elementary	3.0	1.0	2.0	0.7	1.3	23.1%
Charles Carroll Barrister Elementary	1.5	0.6	0.9	0.4	0.4	29.9%
Charles Carroll of Carrollton Elementary	2.9	1.6	1.3	0.1	1.2	1.8%
Cherry Hill Elementary	11.2	1.5	9.8	4.5	4.9	40.4%
Chinquapin Middle	13.4	1.9	11.4	9.4	1.8	70.1%
City Springs Elementary	3.1	0.9	2.2	0.7	1.5	23.5%
Claremont Special Ed.	8.6	1.9	6.7	4.5	1.6	51.6%
Coldstream Park Elementary	12.7	1.7	11.1	6.2	4.5	49.0%
Collington Square Elementary	3.2	1.2	2.0	1.3	0.8	39.2%
Commodore John Rodgers Elementary	3.1	1.0	2.1	0.7	1.3	23.3%
Cross Country Elementary	4.2	1.0	3.2	1.3	1.7	30.4%
Curtis Bay Elementary	6.3	1.0	5.3	3.1	1.9	50.1%
Dallas F. Nicholas, Sr Elementary	2.3	0.6	1.7	0.9	0.8	40.4%
Dickey Hill Elementary	7.2	0.9	6.3	3.6	1.9	49.9%
Diggs-Johnson Middle	2.9	1.2	1.7	0.5	1.1	16.4%

School	Area of Each Cover Type (acres)					% green
	Property	Building	Schoolyard	Vegetation	Asphalt	
Dr. Bernard Harris, Sr Elementary	2.4	0.9	1.5	0.3	1.2	11.4%
Dr. Martin Luther King, Jr Elementary	6.5	0.9	5.7	3.8	1.1	58.3%
Dr. Rayner Browne Elementary	3.7	0.6	3.2	2.4	0.7	63.4%
Edgecombe Circle Elementary	7.8	2.2	5.6	3.6	2.4	45.5%
Edgewood Elementary	2.9	0.9	2.1	1.0	0.9	33.9%
Edmondson/Westside Senior High	26.2	2.4	23.8	17.9	2.9	68.3%
Elmer A. Henderson Elementary	2.3	0.8	1.5	0.9	0.6	39.9%
Eutaw-Marshburn Elementary	3.6	1.5	2.1	0.7	1.5	19.9%
Fairmount-Harford Institute Alt. Learning Center	3.9	1.1	2.8	1.1	1.7	27.0%
Fallstaff Middle	4.3	1.5	2.8	1.2	1.6	27.3%
Federal Hill Elementary	2.9	1.0	1.9	1.0	0.9	34.4%
Forest Park Senior High	12.6	1.5	11.1	8.6	2.3	68.0%
Fort Worthington Elementary	3.2	1.1	2.1	0.1	2.1	2.5%
Francis M. Wood Alternative Learning Center	2.5	0.6	1.9	1.4	0.5	55.4%
Francis Scott Key Elementary/Middle	6.0	1.2	4.8	3.2	1.6	53.5%
Frankford Elementary	11.8	1.0	10.8	7.4	2.5	62.6%
Franklin Square Elementary	3.4	0.9	2.6	0.4	2.3	10.9%
Frederick Douglass Senior High	26.3	2.3	24.0	18.7	4.3	71.0%
Frederick Elementary	3.8	0.5	3.2	2.5	0.7	66.9%
Furley Elementary	6.6	1.5	5.1	3.9	0.9	59.9%
Furman L. Templeton Elementary	1.1	0.5	0.6	0.2	0.5	21.5%
Gardenville Elementary	2.3	0.5	1.8	1.2	0.6	51.8%
Garrett Heights Elementary	6.6	0.8	5.8	3.7	1.5	57.0%
Garrison Middle	11.5	1.7	9.8	7.3	2.0	63.8%
General Wolfe Elementary	0.4	0.3	0.2	0.0	0.2	0.7%
George G. Kelson Elementary	0.2	0.1	0.2	0.0	0.1	13.8%
George Street Elementary	3.1	0.9	2.2	0.1	2.1	2.4%
George W. F.McMechen Middle-Senior	7.4	2.0	5.4	3.6	1.0	48.0%
George Washington Elementary	0.7	0.5	0.3		0.3	0.0%
Gilmor Elementary	3.5	1.1	2.4	0.6	1.9	16.6%
Glenmount Elementary	7.8	1.1	6.7	4.6	1.5	59.0%
Govans Elementary	3.5	0.6	2.9	0.9	2.0	25.0%
Graceland Park-O'Donnell Heights Elementary	8.6	0.8	7.8	6.7	1.0	78.7%
Greenspring Middle	18.5	2.3	16.2	7.3	4.9	39.7%
Grove Park Elementary	5.2	1.2	3.9	2.3	1.1	45.6%
Guilford Elementary	4.9	1.2	3.6	1.9	1.6	38.3%
Hamilton Elementary/Middle	3.8	0.4	3.4	0.7	2.6	18.3%
Hamilton Middle	5.5	1.5	4.0	1.0	2.9	17.8%
Hampden Elementary	2.0	0.8	1.2	0.3	1.0	12.7%
Hampstead Hill Elementary	1.0	0.5	0.5	0.1	0.4	12.6%
Harbor City Learning Center Alt. Learning Ctr.	6.3	0.7	5.6	3.3	1.8	52.6%
Harbor View Special E.	10.7	0.9	9.8	8.3	1.4	78.2%
Harford Heights Elementary	12.7	2.6	10.1	6.4	3.8	50.4%
Harlem Park Elementary	13.3	4.7	8.7	3.7	5.0	27.6%
Harriet Tubman Elementary	1.4	0.6	0.8	0.3	0.5	19.5%
Hazelwood Elementary/Middle	8.9	1.1	7.8	5.4	1.9	60.4%

School	Area of Each Cover Type (acres) Property	Building	Schoolyard	Vegetation	Asphalt	% green
Highlandtown Elementary	2.7	0.7	2.0	1.9	0.7	68.4%
Highlandtown Elementary	0.6	0.7	-0.2	1.9	0.7	337.7%
Highlandtown Middle	1.2	1.1	0.0		0.0	0.0%
Hilton Elementary	3.3	1.0	2.3	0.8	1.5	23.8%
Holabird Elementary	5.9	0.9	5.1	3.3	1.7	56.0%
James McHenry Elementary	3.1	1.2	1.9	0.3	1.6	9.4%
James Mosher Elementary	5.9	0.9	5.0	3.8	1.3	64.1%
John Eager Howard Elementary	4.6	1.5	3.1	1.0	2.0	22.4%
John Ruhrah Elementary	5.0	0.5	4.5	2.1	2.5	41.2%
Johns Hopkins Hospital Instructional Cen	19.7	12.9	6.8	2.9	3.9	14.5%
Johnston Square Elementary	2.6	1.2	1.4	0.4	1.0	16.3%
Joseph C. Briscoe Special Ed.	7.3	2.4	4.9	3.0	1.9	41.1%
Kennedy Krieger Institute Hospital School	0.7	0.7	0.0		0.0	0.0%
Lafayette Elementary	3.4	1.0	2.4	0.6	1.9	17.5%
Lake Clifton/Eastern Senior High	45.0	5.0	40.0	26.5	11.1	58.9%
Lakeland Elementary/Middle	7.6	1.3	6.2	3.1	3.2	40.5%
Lakewood Elementary	1.0	0.3	0.6	0.1	0.6	5.9%
Langston Hughes Elementary	2.7	0.6	2.2	1.5	0.7	54.6%
Laurence G. Paquin Middle-Senior Senior High	2.2	0.7	1.6	0.6	0.7	28.5%
Leith Walk Elementary	7.4	1.2	6.2	3.9	2.0	52.6%
Lexington Terrace Elementary	2.3	0.9	1.3	1.3	0.8	57.8%
Liberty Elementary	3.7	0.8	2.9	1.8	1.0	49.6%
Lillie M. Jackson Special Ed.	4.6	0.5	4.1	3.2	0.8	70.6%
Lockerman-Bundy Elementary	1.6	0.7	0.9	0.2	0.7	12.1%
Lois T. Murray Special Ed.	1.5	0.5	1.0	0.4	0.5	29.6%
Lombard Middle	4.9	2.9	2.1	0.4	2.0	7.8%
Luther C. Mitchell Primary Elementary	0.4	0.1	0.2	0.1	0.2	22.0%
Lyndhurst Elementary	6.3	1.2	5.1	2.0	2.1	31.7%
Madison Square Elementary	2.6	1.2	1.5	0.4	1.1	13.5%
Malcolm X Primary Elementary	1.6	0.5	1.1	0.6	0.4	38.8%
Maree Garnett Farring Elementary	1.5	0.5	0.9	0.5	0.5	31.2%
Margaret Brent Elementary	0.0	0.0	0.0	0.0	0.0	20.0%
Mary E. Rodman Elementary	1.4	0.8	0.6	0.2	0.4	13.0%
Maryland Youth Residence Alt. Learning Center	3.2	0.2	3.0	1.9	0.5	59.4%
Matthew A. Henson Elementary	2.8	1.0	1.8	0.2	1.6	6.4%
Medfield Heights Elementary	3.6	1.1	2.5	1.5	1.0	42.4%
Mergenthaler Vocational-Technical Senior High	16.5	3.1	13.4	3.5	10.0	21.0%
Mildred Monroe Elementary	1.7	0.8	0.9	0.1	0.8	7.5%
Montebello Elementary	8.4	0.7	7.7	4.6	2.7	55.2%
Montebello Hospital Instructional Center Hospital	20.2	2.2	18.0	6.7	10.6	33.2%
Moravia Park Primary Elementary	5.7	1.5	4.2	2.8	1.6	50.0%
Morrell Park Elementary	4.5	1.2	3.3	1.9	1.0	41.9%
Mt. Royal Elementary/Middle	2.8	1.2	1.6	0.4	1.2	15.1%
Mt. Washington Elementary	1.0	0.4	0.6	0.3	0.2	26.5%
Mt. Washington Hospital School Hospital School	22.3	1.0	21.3	7.1	1.8	31.7%

School	Area of Each Cover Type (acres) Property	Building	Schoolyard	Vegetation	Asphalt	% green
North Bend Elementary	1.2	0.2	1.0	0.6	0.3	46.6%
Northeast Middle	12.0	1.4	10.6	6.5	1.3	54.0%
Northern Senior High	15.6	3.5	12.1	9.2	2.9	59.2%
Northwestern Senior High	16.2	2.4	13.7	9.6	3.3	59.6%
Northwood Elementary	13.2	1.5	11.7	8.2	3.0	61.9%
Park Heights Elementary	3.0	0.7	2.3	1.5	0.8	50.1%
Patterson Senior High	32.5	4.7	27.8	20.1	6.9	61.9%
Paul Laurence Dunbar Middle	2.5	0.8	1.7	0.5	1.2	19.9%
Paul Laurence Dunbar Senior High	7.5	2.7	4.8	1.8	2.9	23.7%
Pimlico Elementary	6.9	2.0	4.9	2.5	2.3	37.0%
Pimlico Middle	18.9	2.2	16.8	11.9	4.3	62.7%
Robert Poole Middle	6.1	1.2	4.9	2.3	2.5	38.6%
Robert W. Coleman Elementary	3.1	0.6	2.6	1.6	0.9	52.6%
Rognel Heights Elementary	2.9	1.0	1.9	0.9	1.0	30.9%
Roland Park Elementary/Middle	7.6	1.5	6.1	2.8	1.8	37.0%
Rosemont Elementary	1.7	0.7	1.0	0.5	0.6	27.1%
Samuel F. B.Morse Elementary	1.4	0.7	0.7		0.7	0.0%
Sarah M. Roach Elementary	2.9	0.6	2.2	1.5	0.7	50.3%
School for the Arts Senior High	0.6	0.6	0.0		0.0	0.0%
Sharp-Leadenhall Special/Exceptional/Severely Hand	1.5	0.5	1.1	0.6	0.5	40.1%
Sinclair Lane Elementary	6.4	0.8	5.6	4.1	1.5	63.7%
Southeast Middle	9.8	1.8	8.0	4.7	1.1	48.3%
Southern Senior High	6.8	2.2	4.7	2.6	2.0	37.7%
Southwestern Senior High	0.1					0.0%
Stadium School Elementary	7.2	2.8	4.4	2.4	2.0	33.8%
Steuart Hill Elementary	2.3	0.6	1.7	0.8	0.9	34.2%
Tench Tilghmann Elementary	0.9	0.6	0.2	0.0	0.2	0.2%
The Upton School Home and Hosptial Service	1.0	0.1	0.9	0.6	0.3	62.1%
Thomas G. Hayes Elementary	2.3	1.0	1.3	0.3	1.0	13.7%
Thomas Jefferson Elementary	6.9	0.9	6.0	4.7	1.0	67.3%
Thomas Johnson Elementary	2.8	0.9	1.9	0.6	1.3	21.6%
University Hospital Transitional Hospital School	5.8	4.2	1.6	0.0	1.6	0.7%
Venable Senior Special Ed.	0.9	0.5	0.5	0.2	0.3	19.3%
Violetville Elementary	5.2	1.0	4.2	3.1	1.0	59.1%
Walbrook Senior High	13.3	3.0	10.3	6.5	2.9	49.1%
Walter P. Carter Elementary	8.0	1.2	6.8	4.8	1.3	60.4%
Walter P. Carter Hospital School Hospital School	1.6	1.2	0.4	0.2	0.3	10.8%
Waverly Elementary	3.3	0.8	2.5	1.8	0.5	55.0%
West Baltimore Middle	26.8	3.7	23.1	17.6	5.1	65.6%
Western/Baltimore Polytechnic Institute	51.0	10.5	40.5	28.4	12.0	55.7%
Westport Elementary	6.2	0.9	5.4	3.6	1.7	57.4%
Westside Elementary	2.8	0.8	2.0	1.1	1.0	37.6%
William H. Lemmel Middle	33.2	3.6	29.6	22.3	4.3	67.2%
William Paca Elementary	1.1	0.5	0.6	0.1	0.6	7.1%
William Pinderhughes Elementary	3.6	0.6	3.0	2.1	1.0	57.2%
William S. Baer Special Ed.	5.8	1.7	4.0	2.4	1.1	41.9%

School	Area of Each Cover Type (acres)					% green
	Property	Building	Schoolyard	Vegetation	Asphalt	
Windsor Hills Elementary	5.7	0.4	5.2	3.0	0.9	53.6%
Winston Middle	7.3	1.6	5.7	3.1	1.4	43.4%
Woodbourne Day School at Thurgood Marshall	33.8	4.4	29.3	18.9	7.0	56.0%
Woodhome Elementary	6.1	1.8	4.3	2.3	1.0	37.6%
Yorkwood Elementary	8.0	1.3	6.7	3.4	2.1	42.2%

Lesson Plan for Teachers: Data Graphing Extensions

GRAPHING EXTENSIONS!!!!

For teachers --

The following pages take the same schools used for the graphing exercise, and break them down into watersheds and neighborhoods. If you would like to extend what students have done with graphing data about schools in the last activity, you could have them compare different neighborhoods, and see which neighborhoods have the greenest schoolyards, or compare different watersheds, and see which watersheds have the greenest schoolyards. The possibilities are endless!

3 City Schoolyard Comparative Study – A. Schulman

	Size (mile^2)	Populations (1000s)	Density (persons/ mile^2)	Median Income	Park Area (acres)	# Public Schools	# Public Schools (Elem, middle)	SY Area (acres)
Baltimore	80	650	8,058	30,000	6,000	184	139	809
Boston	48	590	12,165	39,000	2,200	133	75 (96)	212
Detroit	139	951	6,855	29,000	6,000	365	44 (281)	1950

This information can serve as a starting point for practicing graphing with your students. Given the information below, you can have students construct graphs comparing income and schoolyard acres, density and schoolyard acres, etc. This is not meant to be a formal activity, just additional information for you to use, if desired, in your classroom.