



Thinking Global, Educating Local:

Introduction to Sustainability Education

Tuesday, March 12

3:30 - 4:30pm

TEACHERS COLLEGE

COLUMBIA UNIVERSITY

A Graduate School of Education, Health & Psychology

Sustainability Webinar Series

Spring 2019

Tuesday, March 12th, 3:30 - 4:30 p.m.

Thinking Global, Educating Local:
An Introduction to Sustainability Education

Monday, April 8th, 3:30 - 4:30 p.m.

Educators Creating a Climate for Change

Tuesday, May 7th, 3:30 - 4:30 p.m.

School Climate and Student Learning:
Thinking Outside the Box.

Monday, June 10th, 3:30 - 4:30 p.m.

Food Matters: Teaching Ecological Sustainability
Through What We Eat

For more information, go to
www.tc.columbia.edu/sustainability

Thinking Global, Educating Local

Dr. Oren Pizmony-Levy
op2183@tc.columbia.edu

What do “sustainability” and
“sustainable development”
mean to you?

Type your definition in the textbox

How NYC educators define “sustainability” and “sustainable development”

- Fall 2016 Sustainability Plan Survey
- Sample = 1,418 responses
- Data analysis

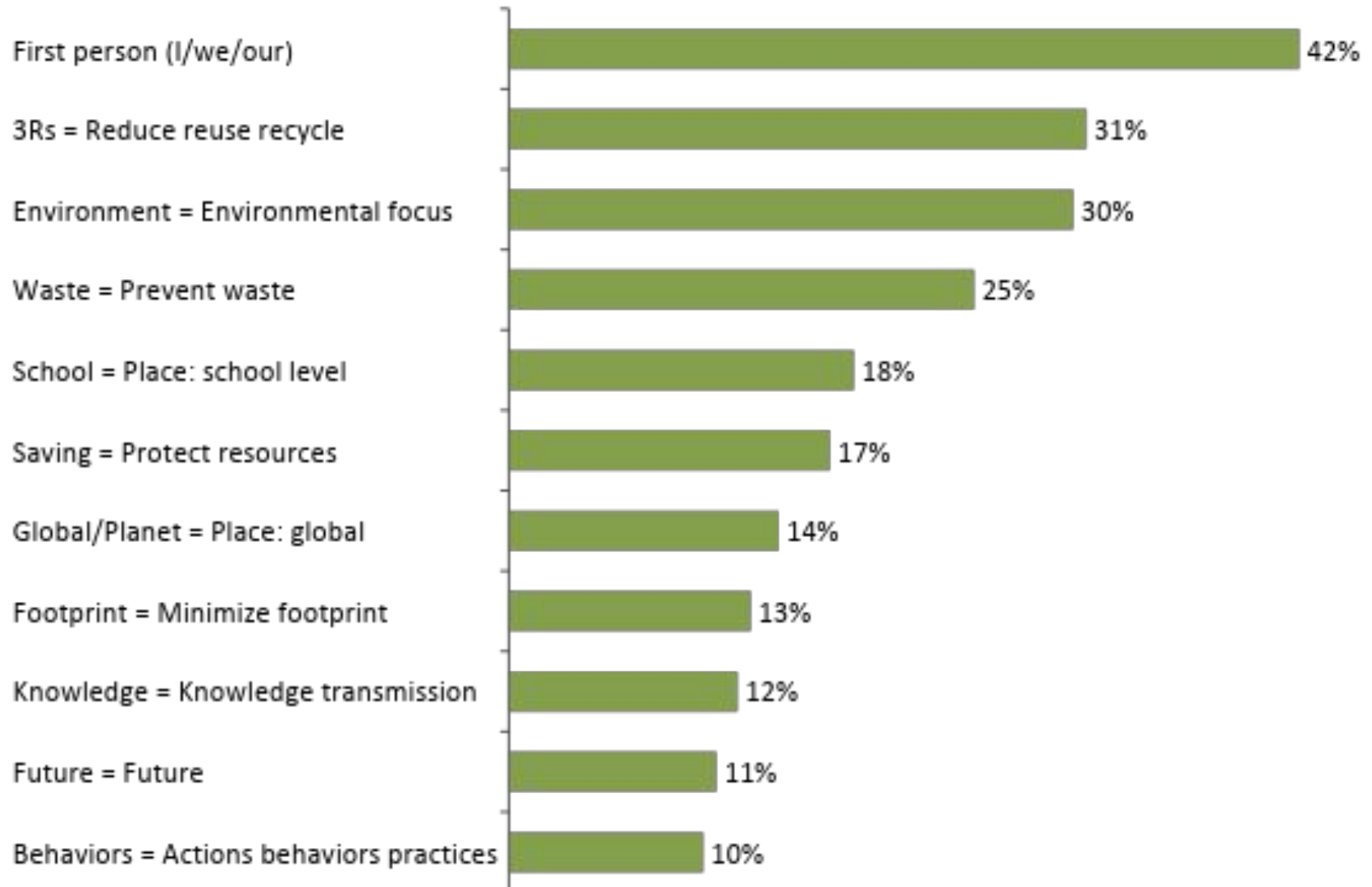
Examples

- “Ensuring a good recycling, reusing program, to impart knowledge on students and staff on conserving energy...” (ID 308)
- “...To always act in the best interests of protecting existing resources and extending the longevity of the planets re-usable resources...” (ID 404)

Examples

- “It means civic responsibility to our planet!”
(ID 1025)
- “To be "sustainable" is to have endless viability - not only as a society or a physical city, but as an integrated ecosystem, working in tandem with the world around us”
(ID 1075)

Common themes in definitions of “sustainable development”

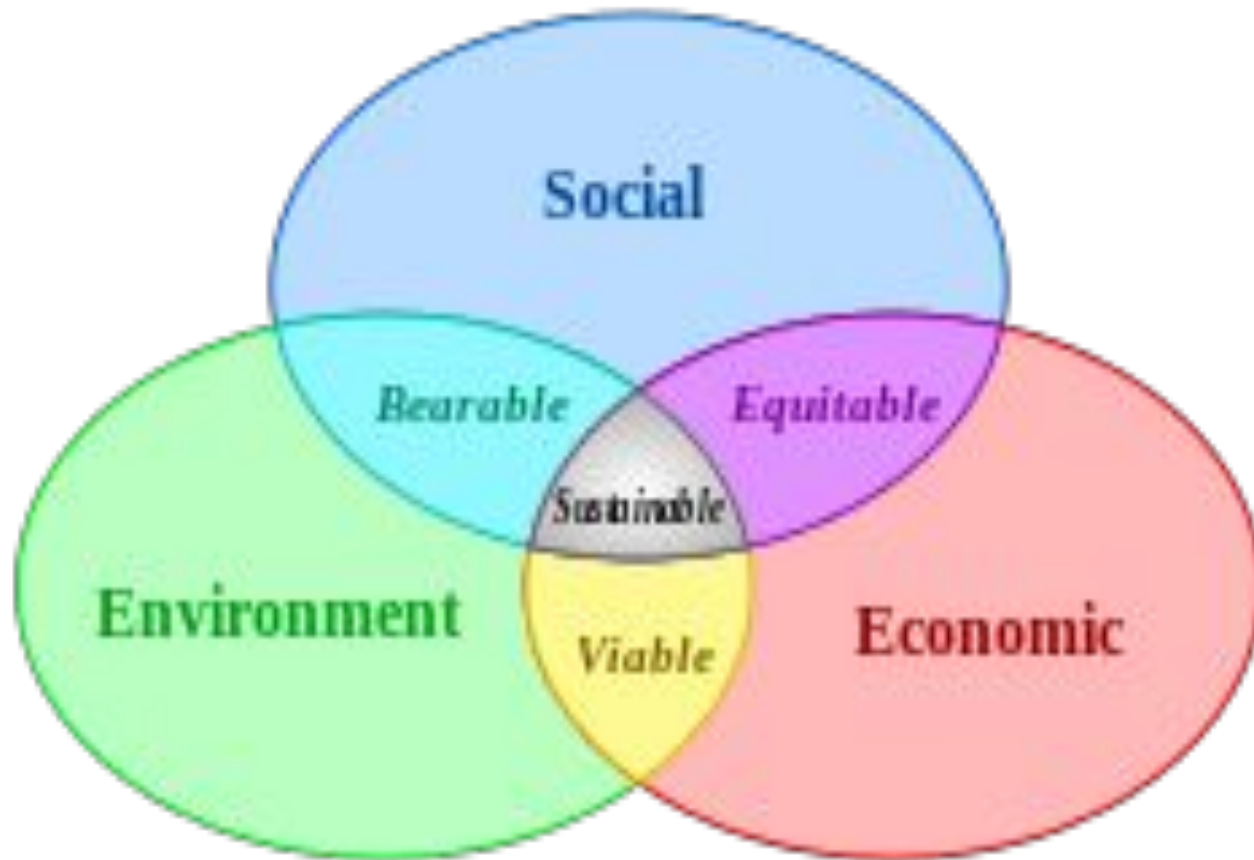


Sustainable Development

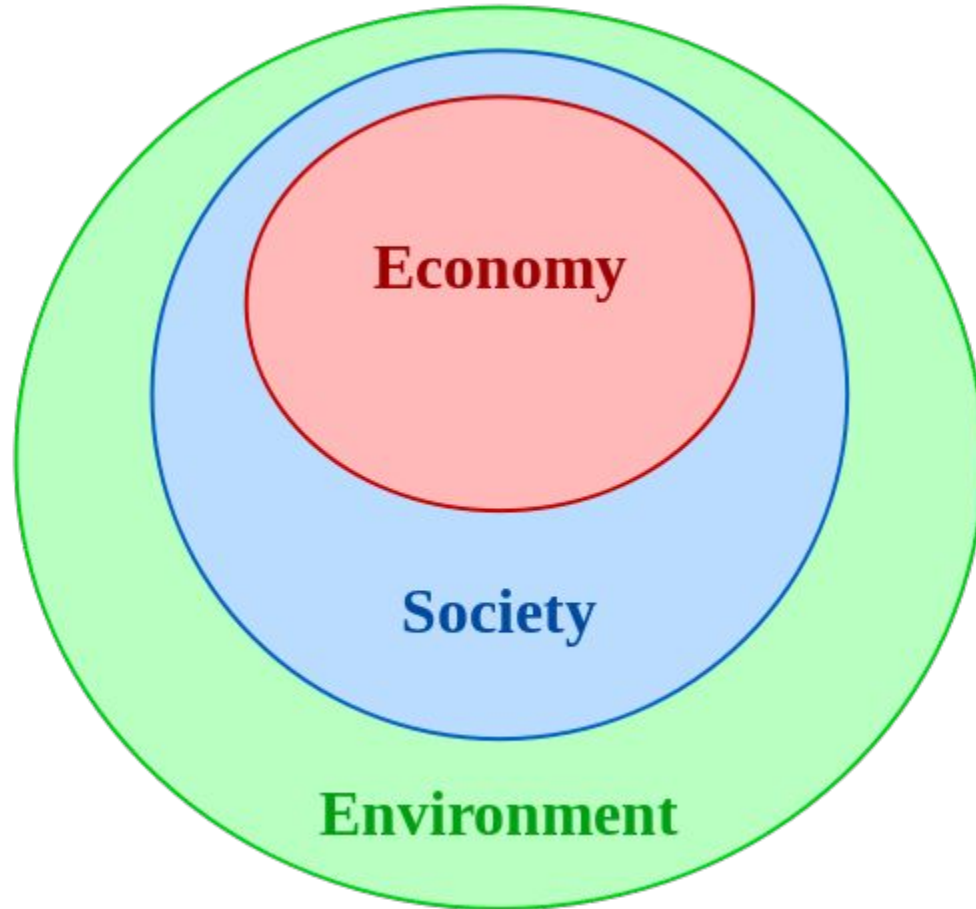
“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

(Brundtland Report 1987)

Sustainable Development

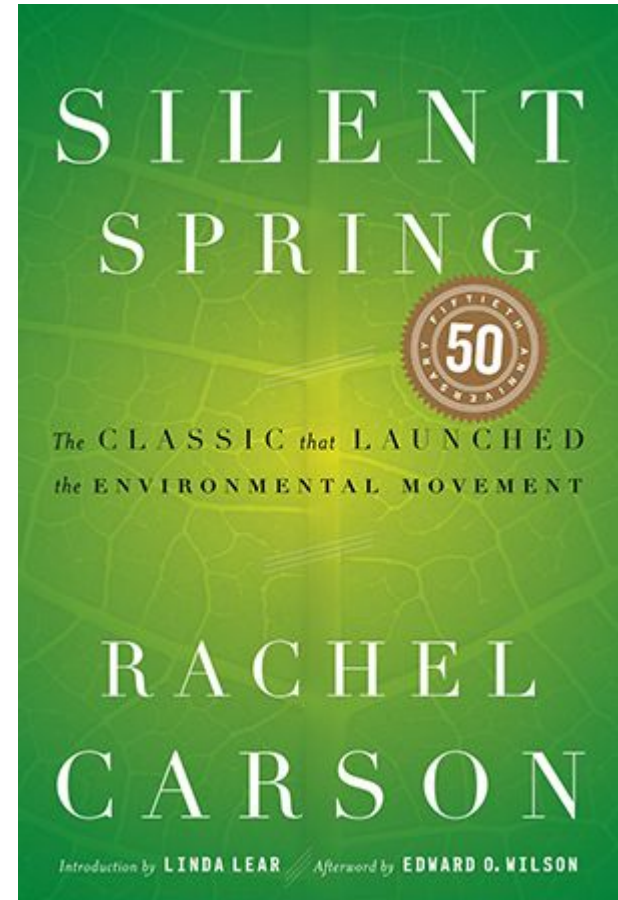


Sustainable Development



Short History of Environmental & Sustainability Education

Rachel Carson





“Earthrise” taken in 1968 by the crew of the Apollo 8 mission



"The Blue Marble" is a famous photograph taken in 1972 by the crew of the Apollo 17

The emergence of global environmentalism

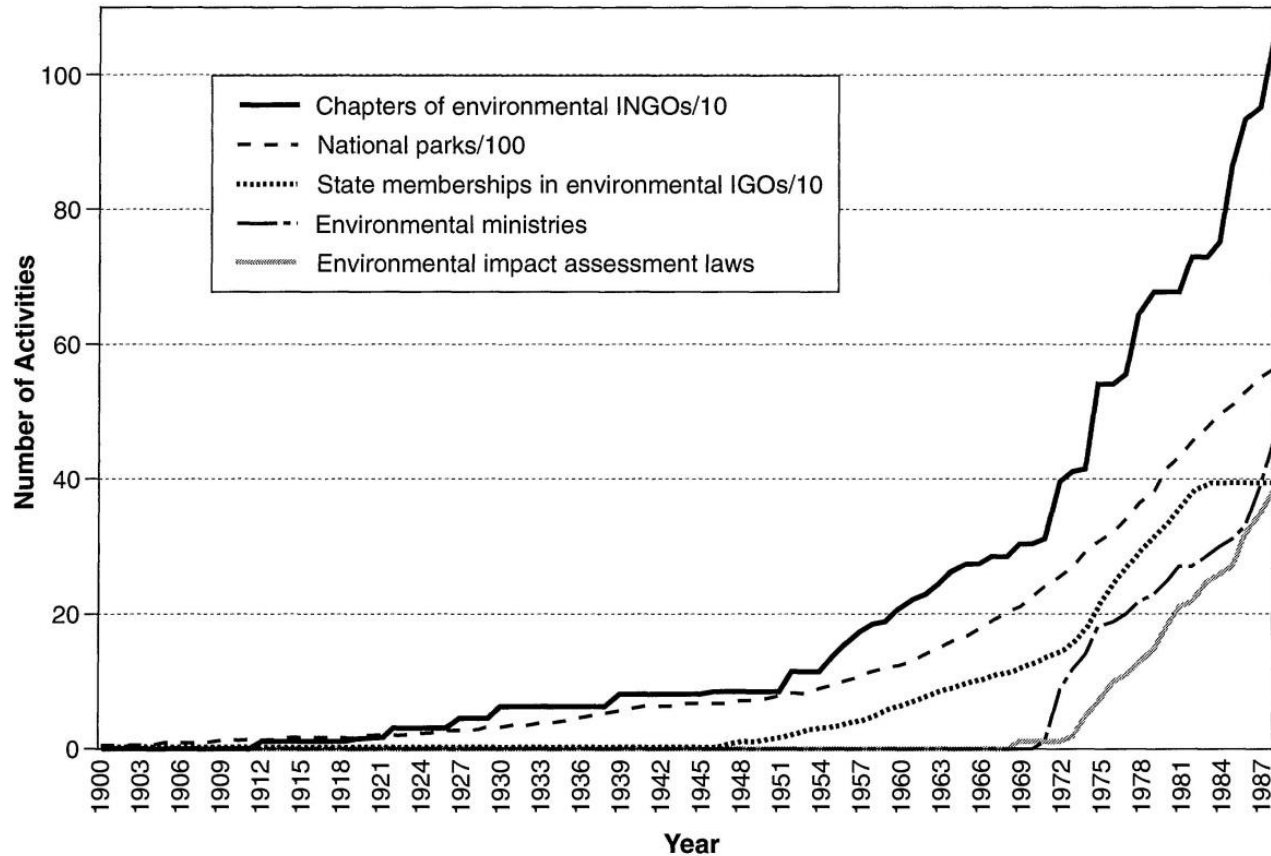


Figure 1. Cumulative Numbers of Five National Environmental Activities, 1900 to 1988

Source: Frank, David John, Ann Hironaka, and Evan Schofer. "The nation-state and the natural environment over the twentieth century." *American sociological review* (2000): 96-116.

Environmental & Sustainability Education: Milestones

- **1970:** International Working Meeting on Environmental Education and the School Curricula (Nevada, USA)
- **1975:** International Workshop on Environmental Education (Belgrade)
- **1977:** Intergovernmental Conference on Environmental Education (Tbilisi)
- **1987:** International Congress for International Strategy for Action in Environmental Education for the 1990s (Moscow)

Environmental & Sustainability Education: Milestones

- **1992:** UN Conference on Environment and Development (Rio de Janeiro)
 - Agenda 21 is published
- **1997:** International Conference on Environment and Society (Thessaloniki)
- **2002:** World Summit on Sustainable Development (Johannesburg)
- **2005-2014:** UN Decade of Education for Sustainable Development

Environmental & Sustainability Education: Milestones

- **2007** - International Conference on Environmental Education (Ahmedabad)
- **2012** - UN Conference on Sustainable Development (Rio de Janeiro)
- **2015** - UN Sustainable Development Goals

Environmental & Sustainability Education: Milestones



1992



2002



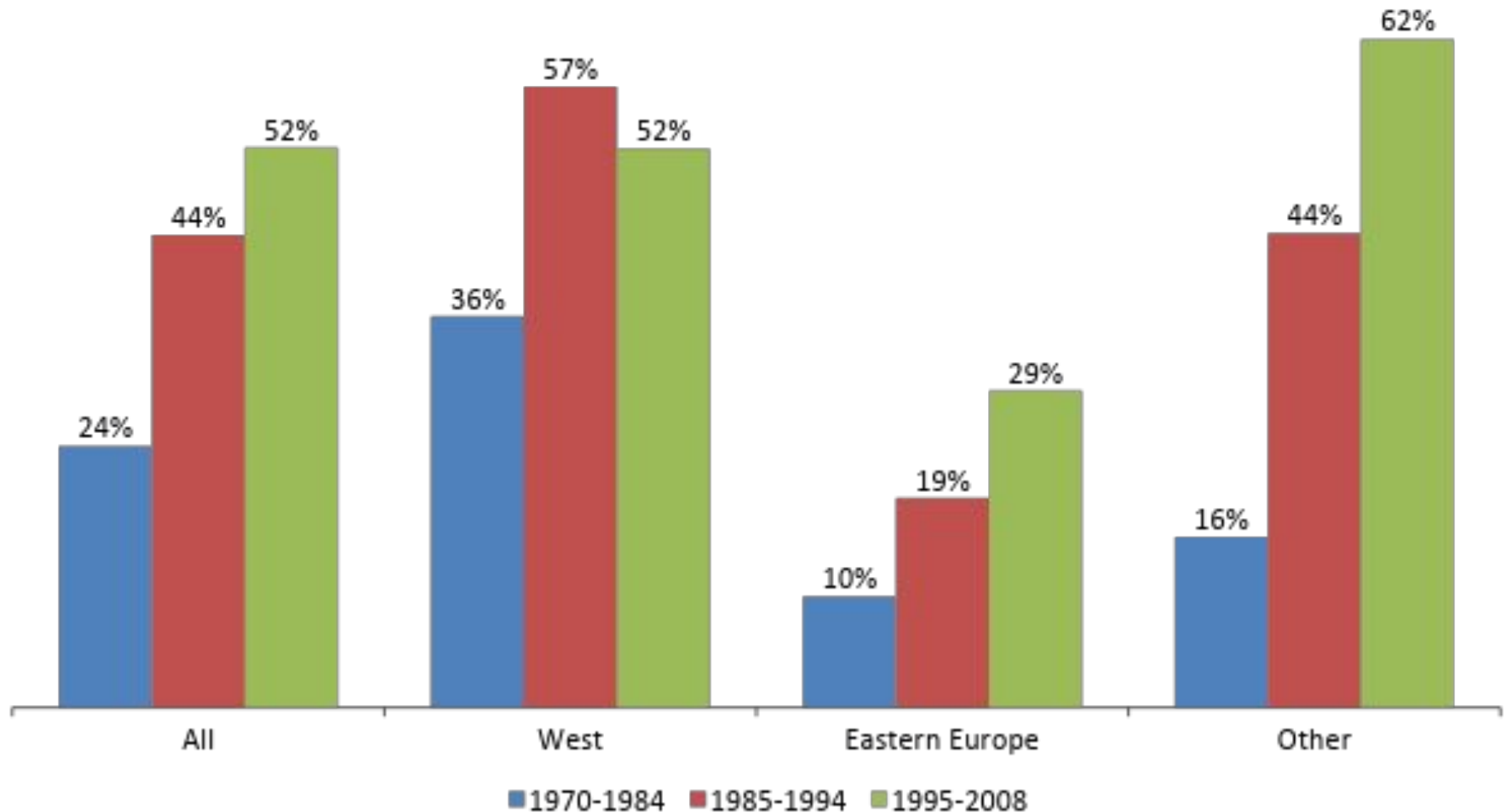
2012

Agenda 21 (1992)

“There is a need to increase people’s sensitivity to, and involvement in, finding solutions for environment and development problems. Education can give people the environmental and ethical awareness, values and attitudes, skills and behavior needed for sustainable development. To do this, education needs to explain not only the physical and biological environment, but the socio-economic environment and human development.”

Environmental & Sustainability Education: Going Global

Percent of social studies textbooks with any discussion of the environment

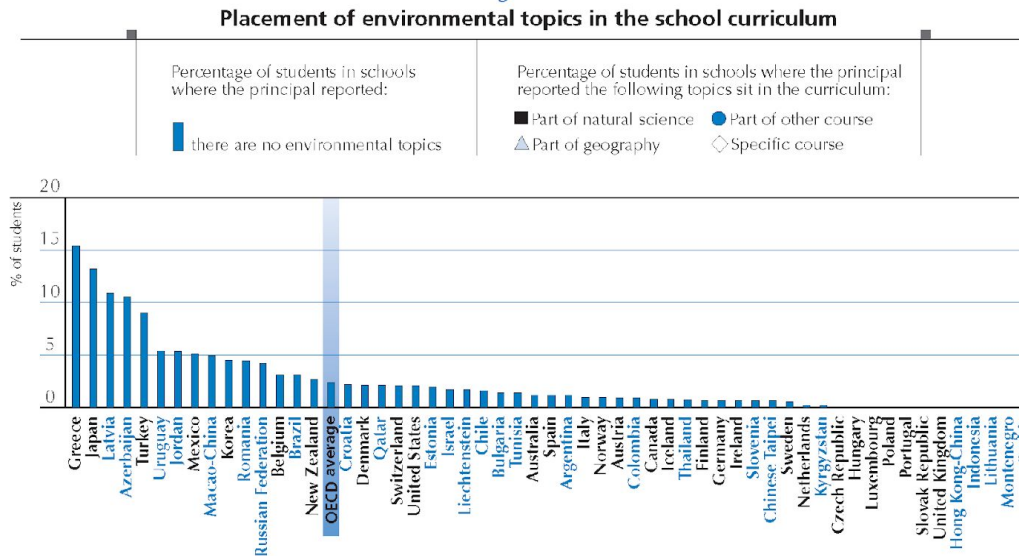


Environmental & Sustainability Education: Going Global

UNITS	LESSONS	STRUCTURES	FUNCTIONS	VOCABULARY	SKILLS	LEARNING STRATEGIES
SIX. MONEY 83-97	History of money	Verbs + <i>ing</i> vs verbs + infinitive (with <i>to</i>)	Talking about history of money	Things used as money	Reading Speaking	Analyzing information
	Borrowing and lending	<i>Can / could</i>	Making requests	Borrowing and lending	Listening Speaking	Asking and answering questions
	Using ATM banking	Verbs with two objects	Understanding instructions	Words related to ATM banking	Reading Speaking	Working with information
	Buying and paying	Comparative and superlative forms of adverbs	Comparing things	Shopping words	Reading Speaking	Working on a diagram
SEVEN. HISTORY AND TRADITIONS 98-112	Self-check	Reviewing		Unit words and expressions	All skills	Self-questioning Self-assessing
	Historical figure	Past simple Relative clauses with <i>who</i>	Talking about a well-known person	Biography	Reading Speaking	Analyzing information
	Discoveries	Past simple vs present perfect	Talking about discoveries	Words related to discoveries	Reading Writing	Comparing
	Traditions around the world	<i>which vs who</i>	Talking about celebrations	Celebrations	Listening Speaking	Identifying people and things
EIGHT. CHANGING TIMES 113-127	Superstitions	1 st conditional	Discussing superstitions	Superstitions	Listening Speaking	Listening for main and detailed ideas
	Self-check	Reviewing		Unit words and expressions	All skills	Self-questioning Self-assessing
	Life then and now	<i>were to</i> (positive)	Talking about changes in social life	Changes in social life	Reading Speaking	Comparing
	New York in the past and now	<i>used to vs past simple</i>	Talking about changes in city life	Words related to a city	Reading Writing	Comparing
NINE. THE ENVIRONMENT 128-142	Did you use to ... ?	<i>used to</i> (question forms)	Talking about changes in personal life	Changes in personal life	Listening Speaking	Interviewing
	I am different now	<i>used to</i> (all forms)	Discussing changes in people's lives	Changing lives	Listening Writing	Comparing
	Self-check	Reviewing		Unit words and expressions	All skills	Self-questioning Self-assessing
	Green nature	Past simple vs present perfect	Talking about nature	Words related to nature	Listening Writing	Drawing
TEN. SCIENCE AND TECHNOLOGY 143-157	Nature protection	<i>Should / shouldn't vs must / mustn't</i>	Talking about nature protection	Words related to nature protection	Reading Speaking	Working on a diagram
	Marmots in danger	Present simple (facts)	Talking about endangered animals	Words related to animals	Listening Speaking	Interviewing
	Recycling	Active / passive modals	Talking about recycling	Words related to recycling	Reading Speaking	Problem solving
	Self-check	Reviewing		Unit words and expressions	All skills	Self-questioning Self-assessing
TEN. SCIENCE AND TECHNOLOGY 143-157	Science facts	Present passive (positive)	Talking about scientific facts	Scientific words	Reading Writing	Analyzing
	What is it used for?	Present passive (questions) <i>For + ing</i> verb form	Identifying and describing things	Electrical appliances	Listening Speaking	Asking and answering questions Playing a guessing game
	Inventions	Past participle	Talking about inventions	Inventions	Reading Writing	Reading for main and detailed ideas
	When was it done?	Past passive (questions)	Asking for information	More inventions	Listening Speaking	Gap filling and comparing
Self-check	Reviewing		Unit words and expressions	All skills	Self-questioning Self-assessing	

Environmental & Sustainability Education: Going Global

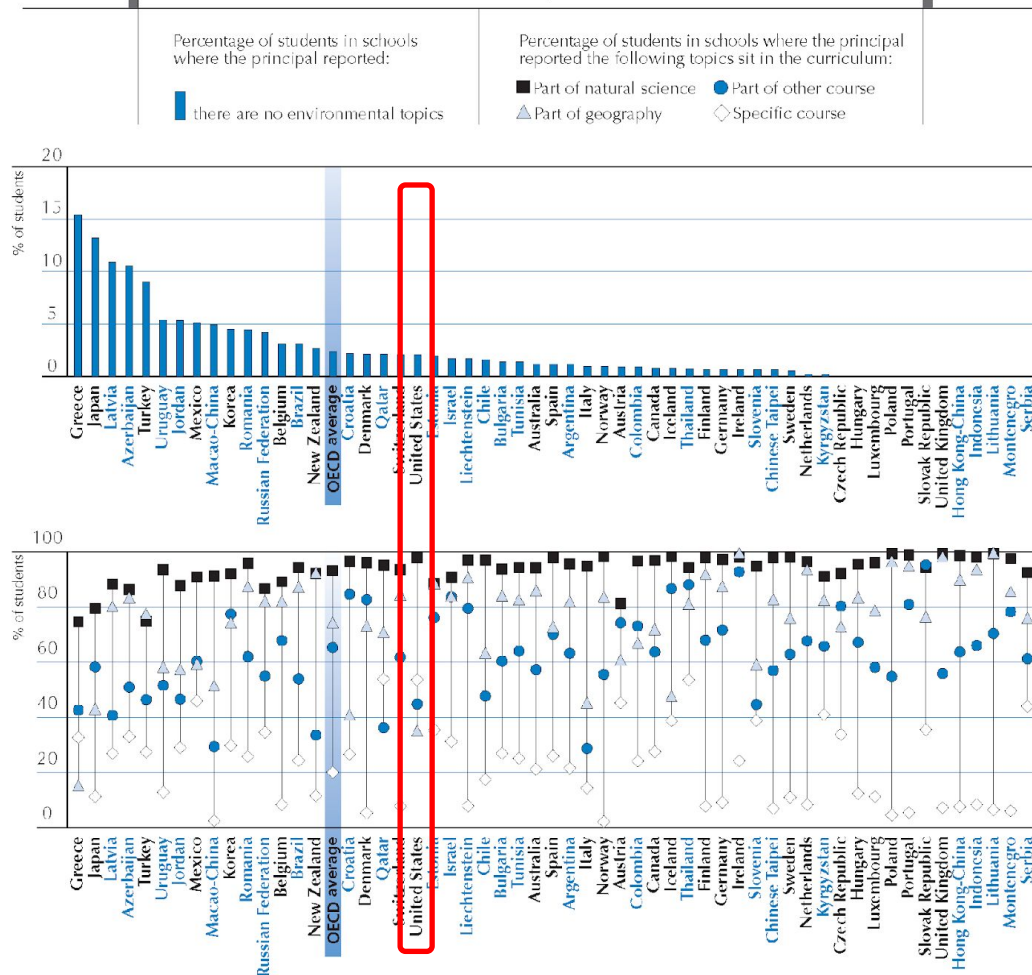
Figure 4.1



Environmental & Sustainability Education: Going Global

Figure 4.1

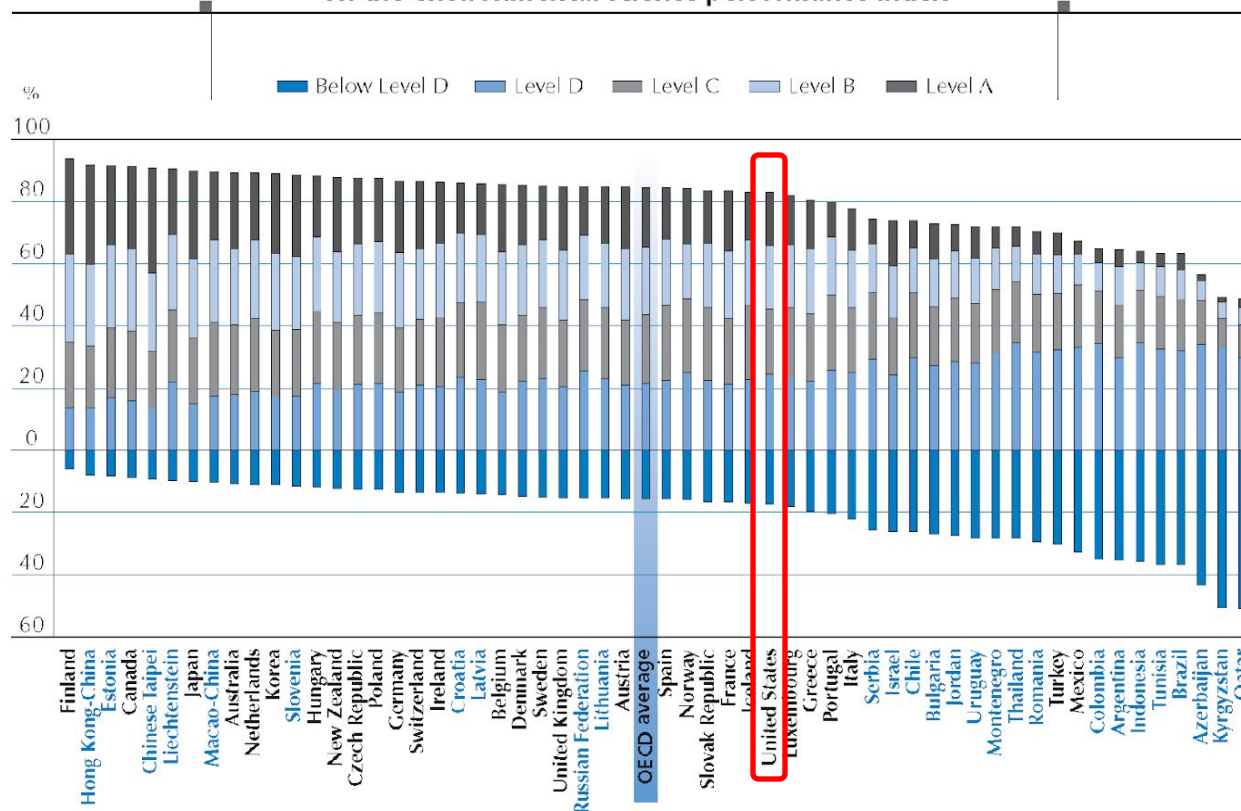
Placement of environmental topics in the school curriculum



Environmental & Sustainability Education: Going Global


Figure 2.1

Percentage of students at each proficiency level on the environmental science performance index



Countries are ranked in ascending order of percentage of 15-year-olds below Level D.

Source: OECD PISA 2006 Database, Table A2.1.

StatLink  <http://dx.doi.org/10.1787/562200685357>

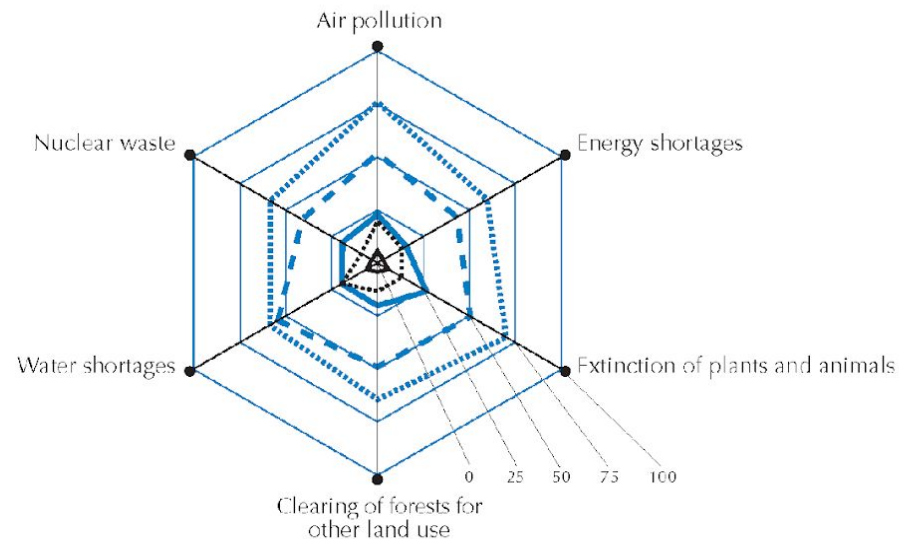
Environmental & Sustainability Education: Going Global

Figure 4.3


Main sources for students to learn about environmental issues in the OECD

OECD average percentages for sources where students mainly learnt about the environmental issues

..... School
 - - - - TV, Radio, Newspaper or magazines
 — Friends
 Family
 — Internet or Books



Source: OECD PISA 2006 Database, Table A4.5.

StatLink  <http://dx.doi.org/10.1787/562235784260>

Back at home: New York City

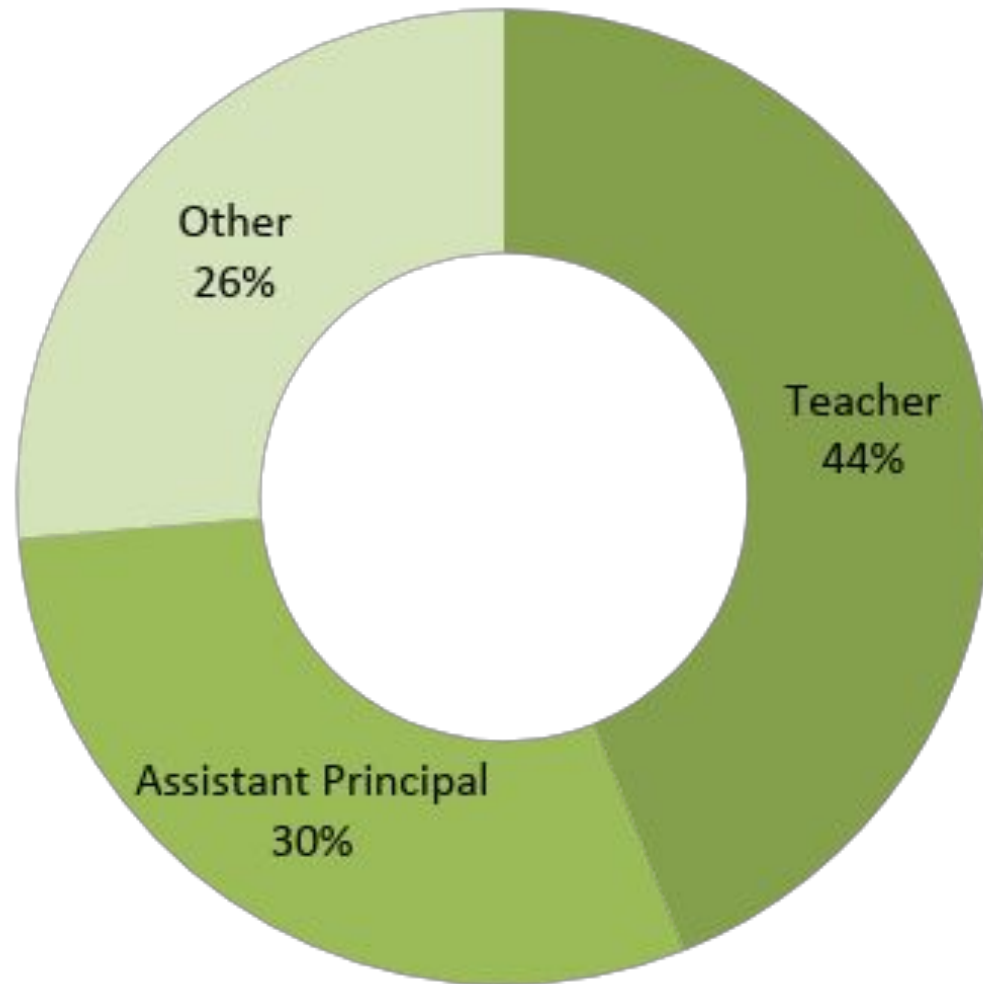


How do NYC schools engage with
Environmental & Sustainability
Education?

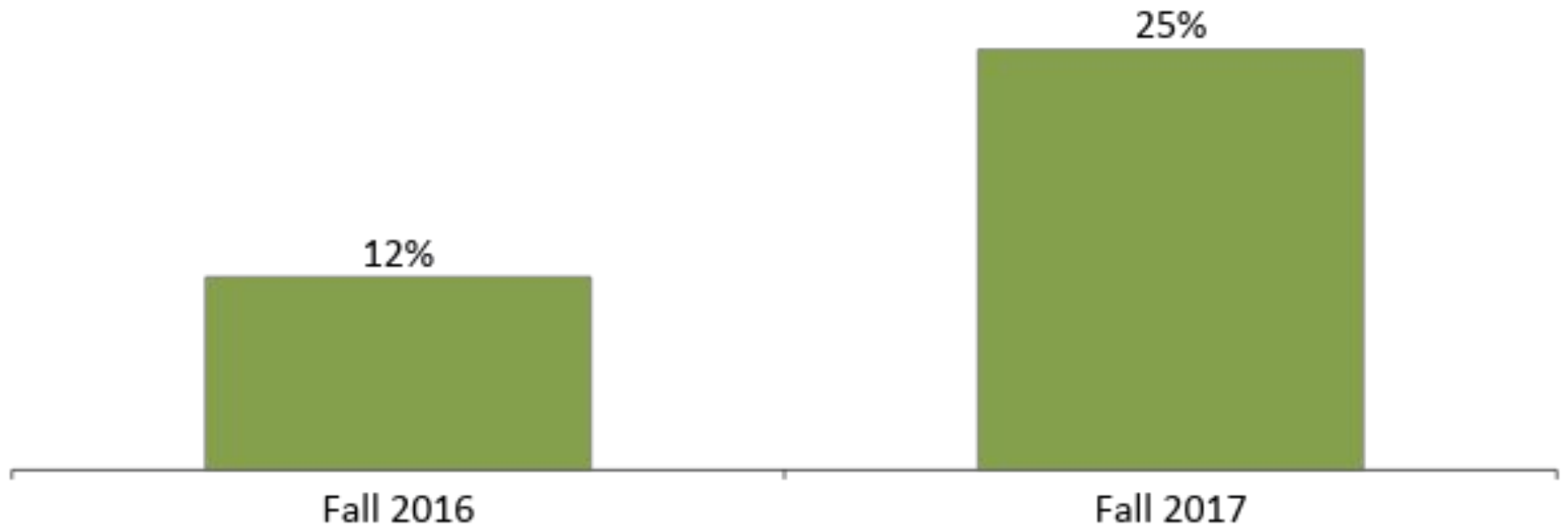
Chancellor's Regulation A-850

- Part of PlaNYC 2030
- Established the Office of Sustainability within the Division of School Facilities (2009). Focal areas:
 - Recycling
 - Energy conservation
 - Green curriculum initiatives
- Policy instrument: Requiring every public school to appoint a Sustainable Coordinator

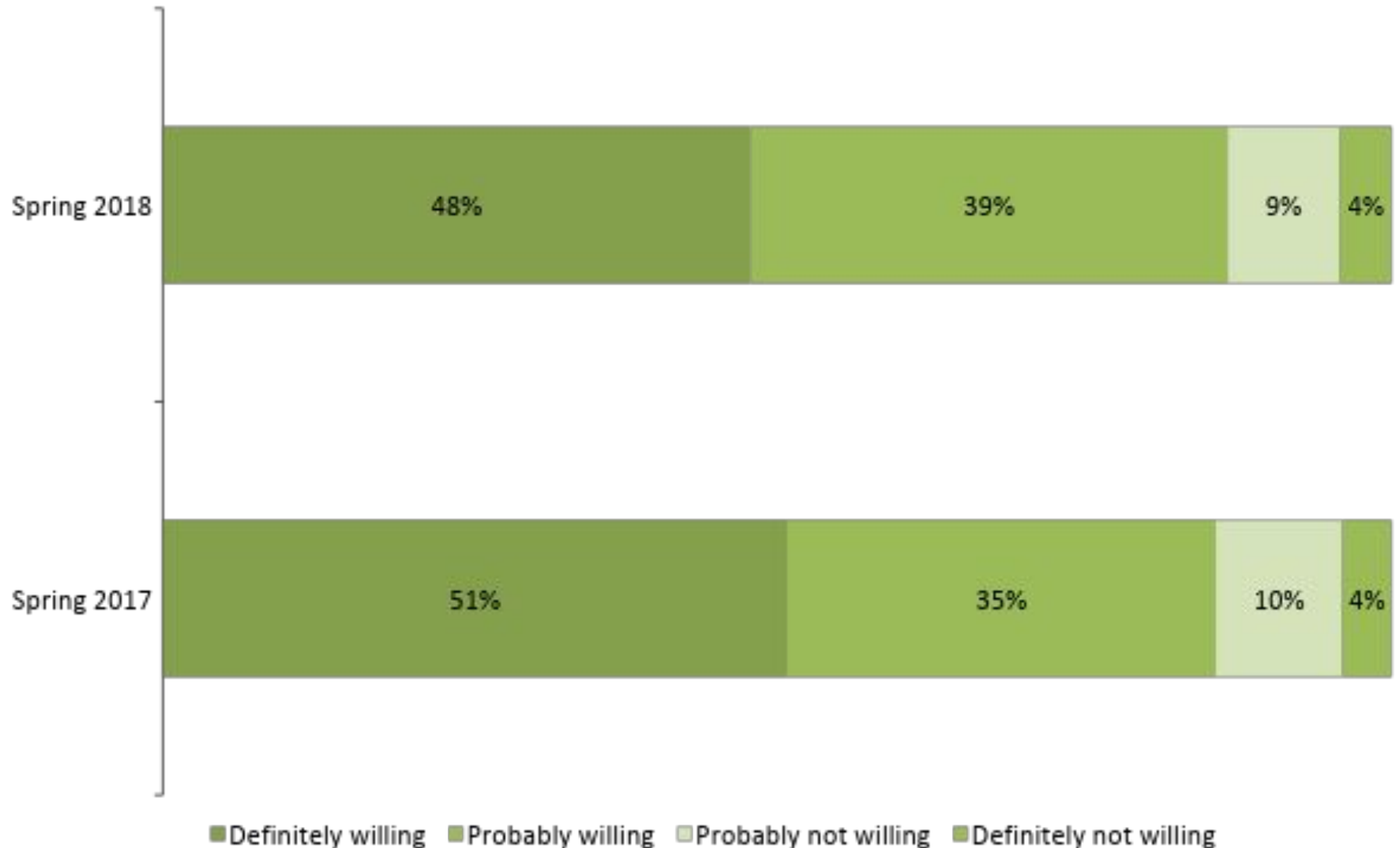
Sustainability Coordinators, Main Position in School



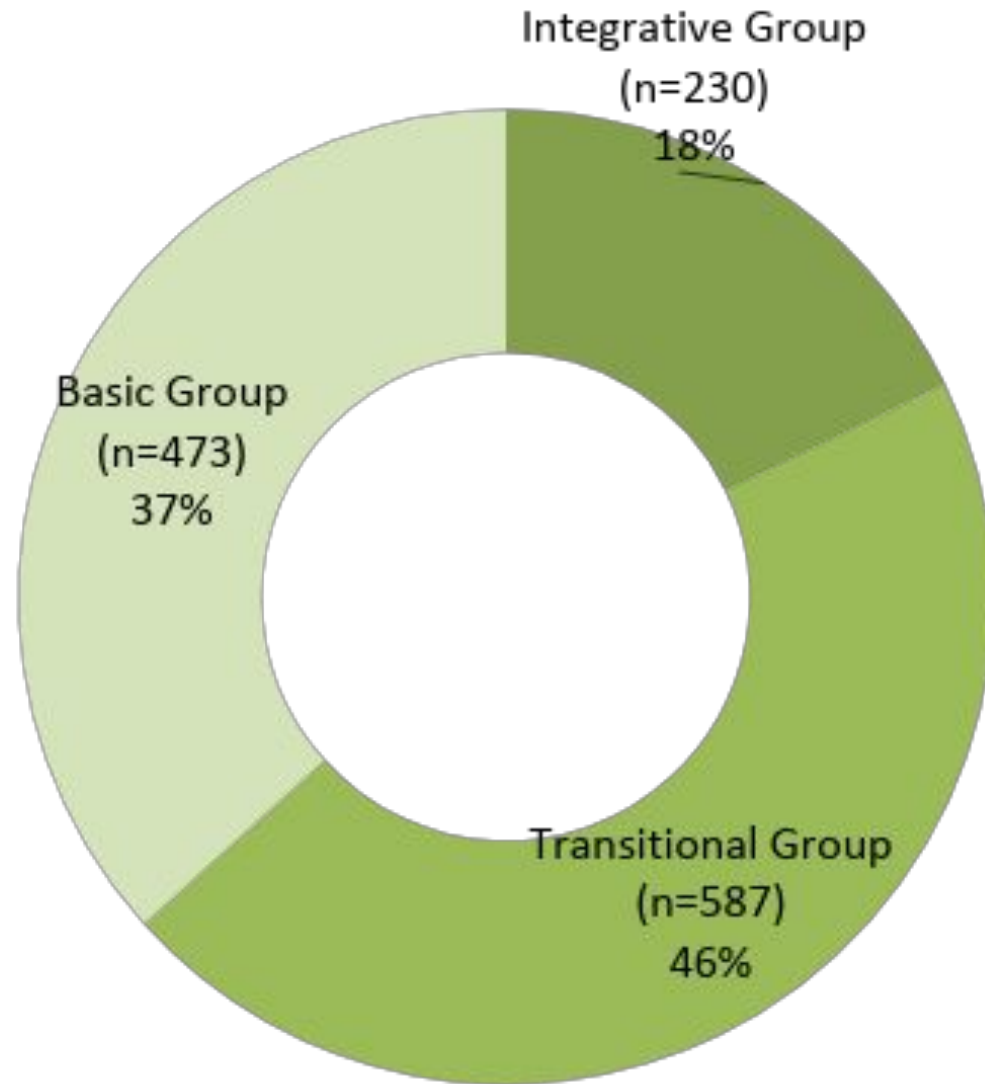
Share of Sustainability Coordinators who volunteered for the role



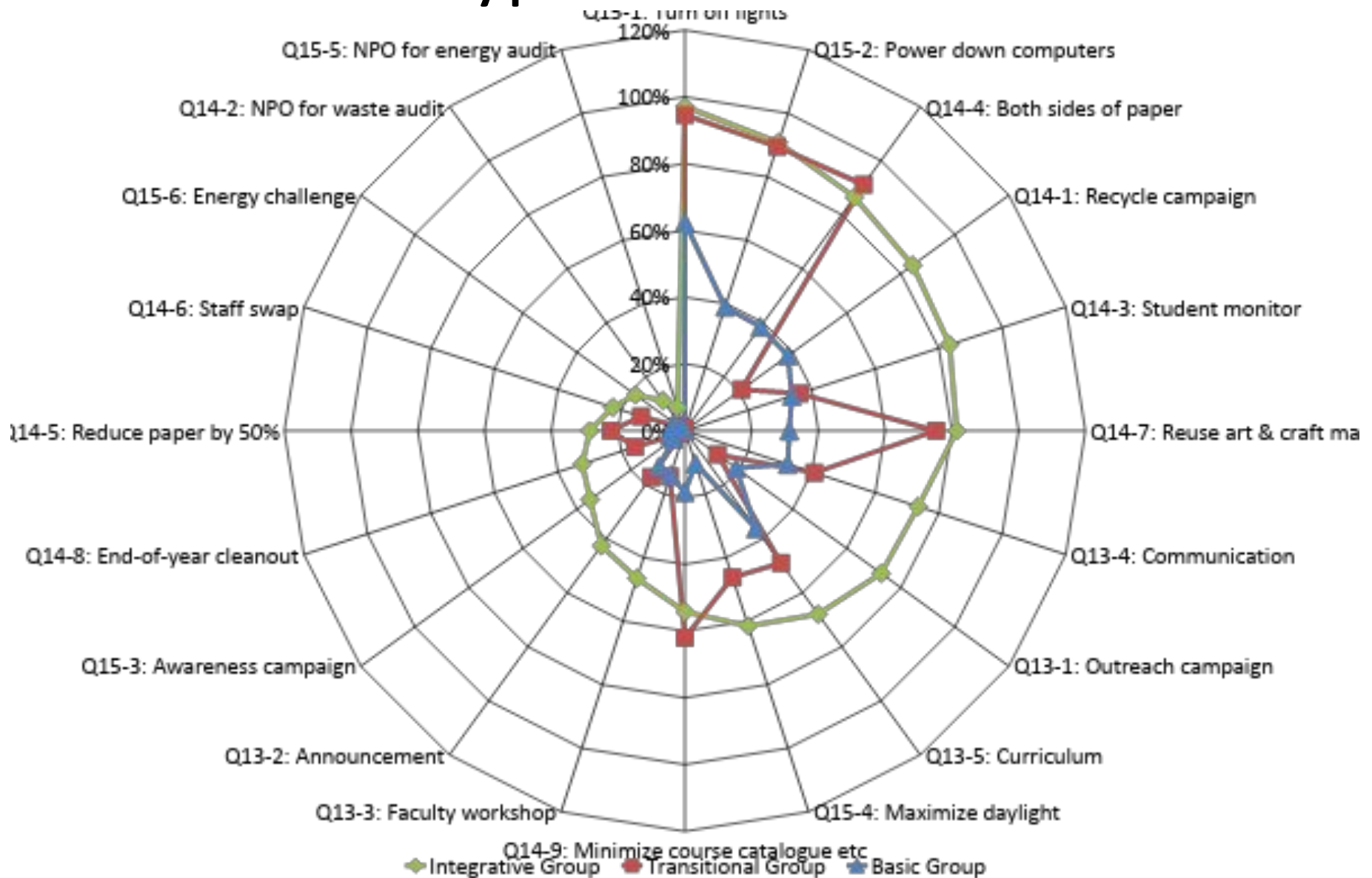
Would you be willing to continue serving as your school's Sustainability Coordinator next year?



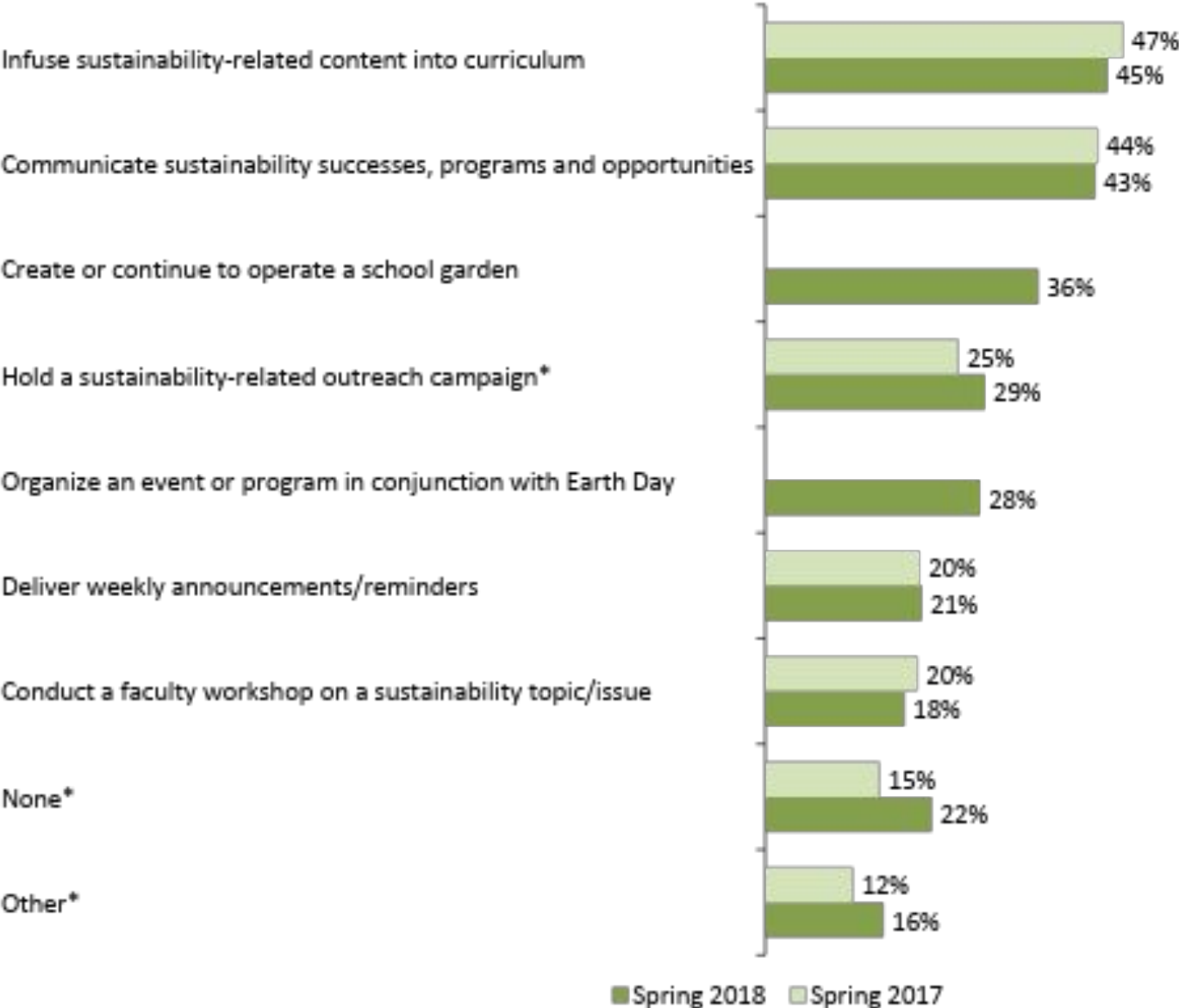
Three Types of Sustainability Coordinators



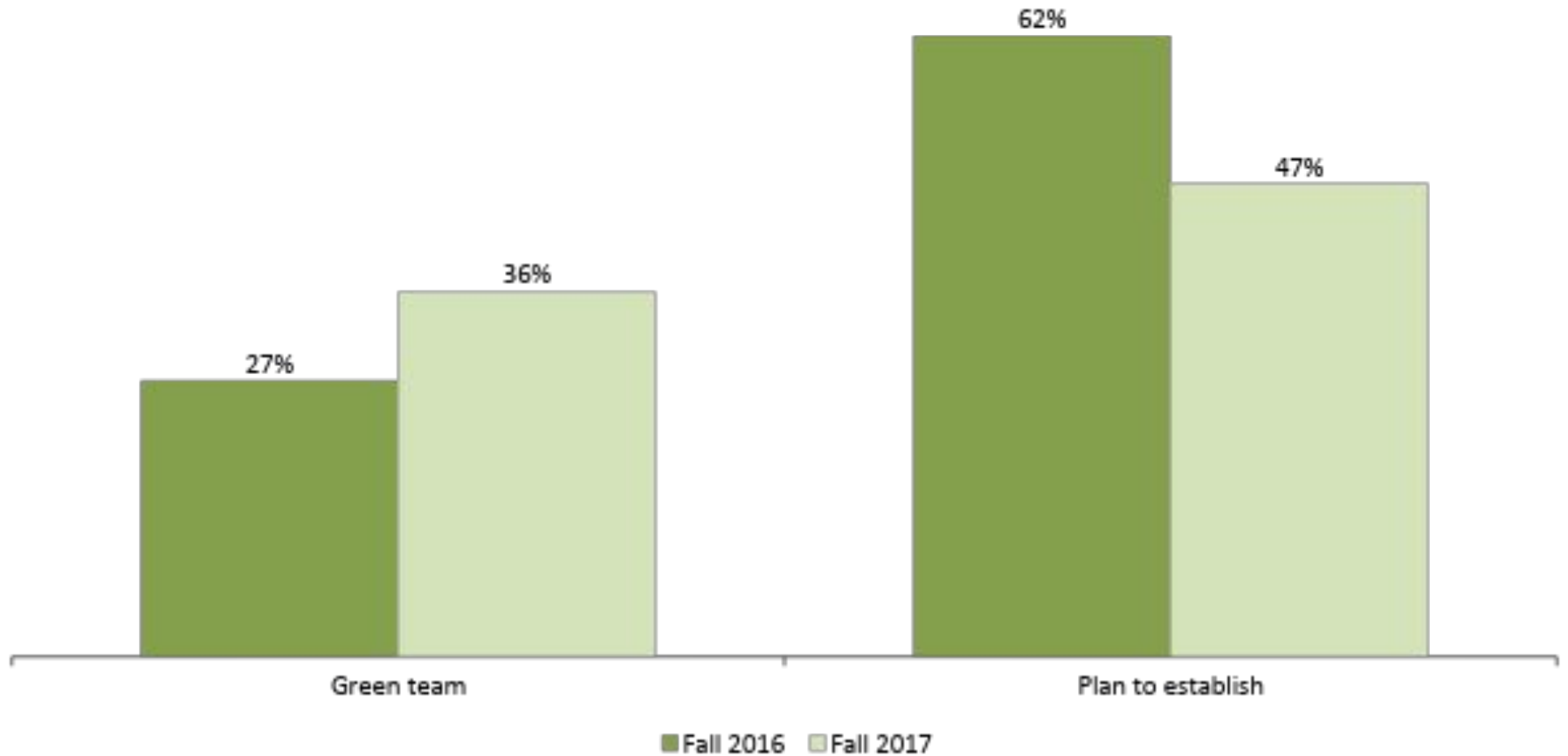
Three types of coordinators



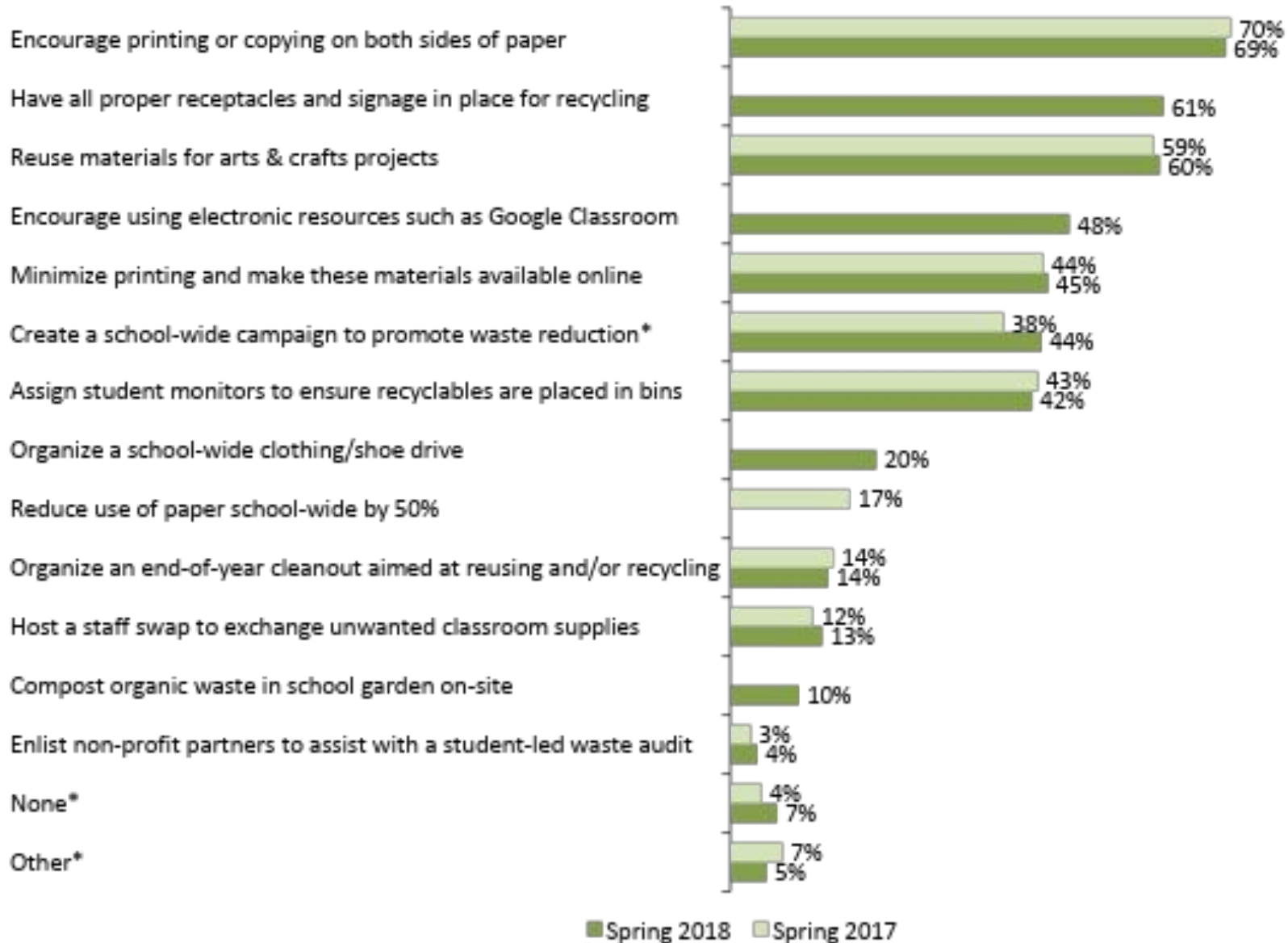
Communication & Education



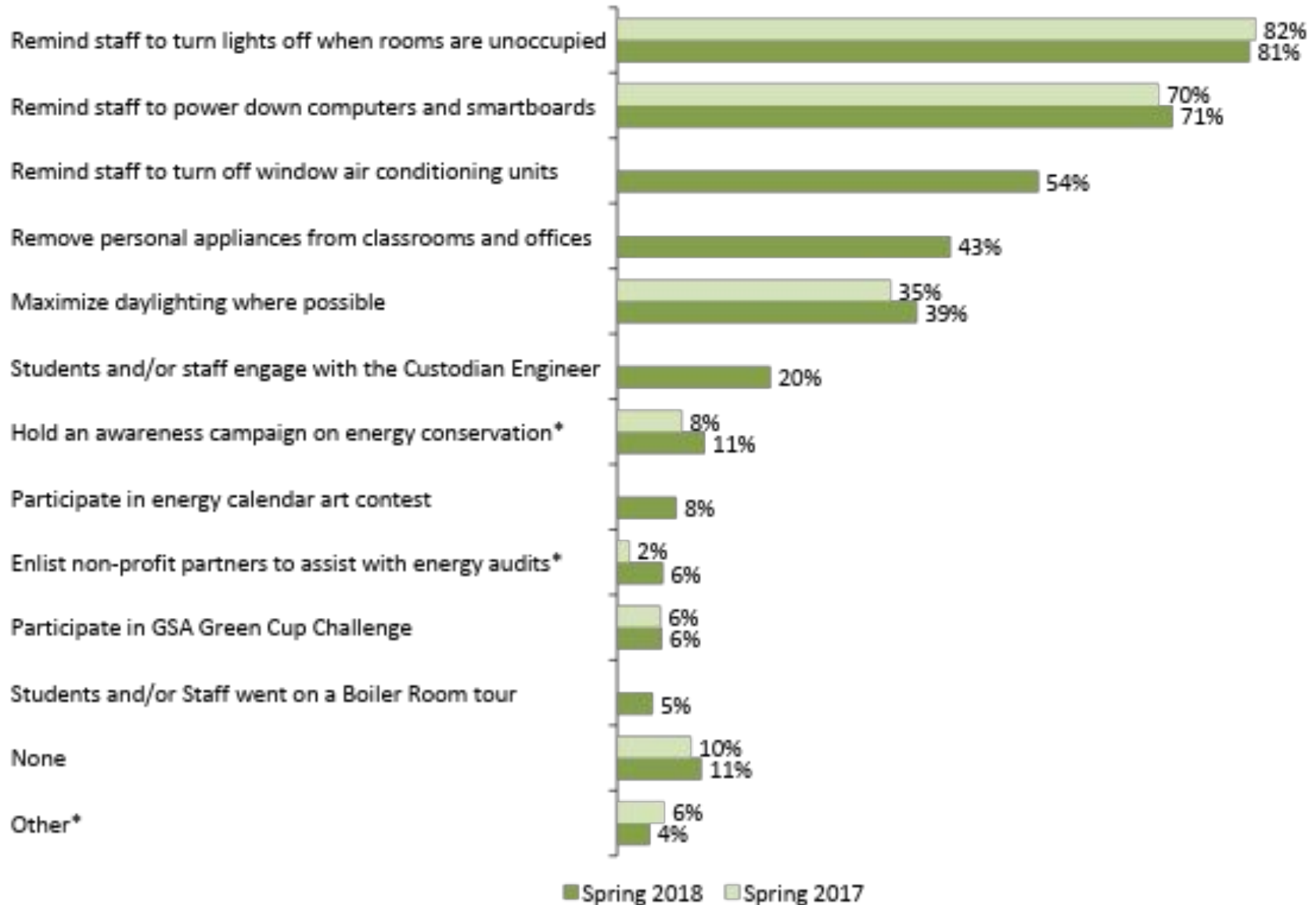
Student green team



Recycling and ONE NYC Plan



Energy



Thinking Global, Educating Local

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Green at Fifteen?

HOW 15-YEAR-OLDS PERFORM
IN ENVIRONMENTAL SCIENCE
AND GEOSCIENCE IN PISA 2006

Programme for International Student Assessment



ESE as a Fundamental Challenge to Education and Schools

- more than the sheer transmission of knowledge
- does not resonate with the cultural landscape of modern schooling
- does not fit the common disciplinary boundaries, it is multidisciplinary and interdisciplinary
- does not fit the common practice of teaching in class
- emphasizes issues that transcend national borders and associates with world citizenship, thus counter the nation state narrative

Environmental & Sustainability Education

“Environmental education is aimed at producing a citizenry that is knowledgeable concerning the bio-physical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution”

(Stapp et. al 1969)

Environmental & Sustainability Education

“Education for sustainable development aims to help people to develop the attitudes, skills, perspectives and knowledge to make informed decisions and act upon them for the benefit of themselves and others, now and in the future. It helps the citizens of the world to learn their way to a more sustainable future.” (UNESCO, 2005)



Thaddeus Copeland
Deputy Director of Sustainability
tcopeland@schools.nyc.gov



ABOUT: Located within the Division of School Facilities (DSF), the DOE Office of Sustainability engages with staff and students to integrate sustainability practices and programs into DOE operations, curricula, and culture.

Impact of NYC DOE



Katherine Grimm School for Sustainability – Staten Island

DOE SUSTAINABILITY GOALS



ENERGY & CLIMATE:

- Reduce greenhouse gas emissions from DOE Buildings 80% by 2050 from a 2005 baseline.
- Reduce greenhouse gas emissions from DOE buildings 35% by 2025.



WASTE:

- Send zero waste to landfills by 2030.
- Increased compliance with DSNY waste collection protocol.



OFFICE OF SUSTAINABILITY STRATEGY:

- **Layered Approach:**
 - Integrate across all layers of DOE
- **Confluence of Facilities + Education**
 - Connect Educational Opportunities to Building Assets
 - Internal and External Partnerships
- **Citywide Engagement**
 - Internal and External Partnerships
- **Create Robust Programs Around Goals:**
 - Case Study: NYC Solar Schools
 - Case Study: Zero Waste Schools

DOE SUSTAINABILITY GOALS



ENERGY & CLIMATE:

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CASE STUDY: NYC Solar Schools

A key goal set forth in the *OneNYC* is to install 100 MW of solar on City-owned buildings by 2025

- Schools are the largest portfolio of city owned buildings
- Schools consume over 25% of NYC's municipal energy
- Solar is economical, environmental, and most of all, educational!



CASE STUDY: NYC Solar Schools



Leveraging Facility Assets for Sustainability Education

- Professional development training opportunities for educators
- Educator access to real-time solar production dashboards and data
- Display monitors, posters and banners

CASE STUDY: NYC Solar Schools



Layered Approach: Solar Career Tech Education Pilot Program

- Internal DOE Partnerships with STEM, Career Technical Education
- External Partnership with Solar One
- Integrated solar into high school electrical vocational programs, expanding job-training and workforce development opportunities with solar
- 11 CTE high schools

DOE SUSTAINABILITY GOALS



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CASE STUDY: Zero Waste Schools

Goal: Maximize Landfill Diversion from 100 schools within 5 years; make all schools Zero Waste Schools by 2030.

Facility Resources:

- Uniform Classroom Bins
- Uniform Cafeteria Sorting Stations
- Uniform Hallway/Common Space Bins
- Dual Bin Dollies
- Creation of Waste Storage Areas

Educational Resources:

Customized Programming & Support



CASE STUDY: Zero Waste Schools

Support Facility Infrastructure with Educational Programming

- Support from DOE Sustainability Specialist
- Outside Partners: GrowNYC Recycling Champions Program
- Creation of New Programs:
 - “Race Against Waste”
 - Zero Waste Pledge Schools



A Collaboration Between

OFFICE OF SUSTAINABILITY
and
SERVICE IN SCHOOLS

reduce & reuse

Green Teams get to the root of the problem.

Rethink **Reduce** Reevaluate.
Repurpose **Reuse** Regenerate.

Join the Race Against Waste!

The logo for 'Race Against Waste' is a circular emblem. It features a green silhouette of a person running towards the right, with a recycling symbol (three chasing arrows) behind them. The text 'RACE AGAINST WASTE' is written in a circular path around the top of the emblem.

CITYWIDE ENGAGEMENT:

- **Raise Awareness through Growing Network**
 - City Agencies, non-profits, advocacy groups
 - Outreach events
- **Maintenance and Growth of Partner Network**
 - 46 External Partners, 6 Internal Partners
 - Biannual partner meetings
 - Citywide trainings for all DOE Staff

Sustainability at P721K

Erin Laraway, Sustainability Coordinator
Roy Campanella Occupational Training
Center
Brooklyn, NY

Schoolwide Programs Developed

- Edible Garden
- Native Species Garden
- Pollinator Habitat
- Recycling Initiatives
- Indoor School Farmer's Markets
- Garden to Café Events
- Outdoor Learning Environment



Local Partnerships

- Wild Bird Fund NYC
- Eco Schools
- NYC Department of Sanitation Compost Project
- New York Restoration Project
- Garden to Café
- Grow to Learn
- Green Thumb
- Project Butterfly NYC
- Student Volunteer Park Maintenance Program at Floyd Bennett Field

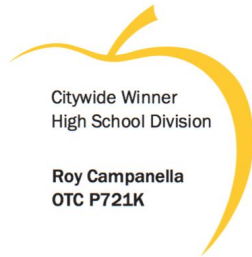
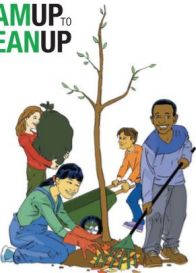


Awards, Recognitions & Grants

- Citation from Brooklyn Borough President, Eric Adams
- New York Restoration Project Rose Award (citywide winner)
- Golden Apple Award
- \$12,000 in Grants and donations for school garden initiative



**TEAMUP
TO
CLEANUP**



Citywide Winner
High School Division

Roy Campanella
OTC P721K

2015 GOLDEN APPLE AWARDS

This certificate is awarded with the sincere appreciation and esteem of a grateful Department and City in recognition of your school's efforts to help make New York City shine.



City of New York
Department of Sanitation
Bureau of Recycling and Sustainability
ny.gov/recycle



Lessons Learned

- Students benefit from outdoor, hands on learning experiences.
- Spending time in nature reduces stress for staff and students.
- Students are motivated and happy to learn outdoors.
- Increased student engagement.

BEFORE PHOTOS



AFTER





Sustainability 2019

P77K @ 62 Park Place

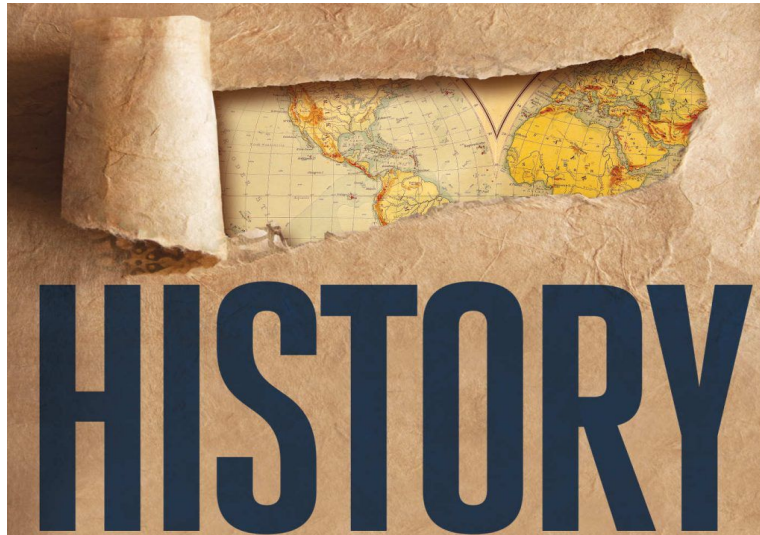
Jazzmen Murphy, Teacher/Sustainability Coordinator

Ellyn Kerr, Teacher

Sarah McDowell, Teacher

Marisa Beharry-Vanzie, Assistant Principal

The History of P77K's Sustainability Efforts



P77K's Garden (2003)

- In the past, the P77K School Garden was a beautiful floral garden. It was a floral garden because it was assumed by the Botany Teachers that it might have a high concentration of lead due to the age of the building.



P77K's Garden (2003)

- Teachers and students worked in the garden and attended daily classes at Brooklyn Botanical Garden to further their Botany skills. Eventually, fruits and vegetables were planted in large containers located on the side of school building. The containers were placed on the concrete walkway and never were placed in the soil garden.



Fast Forward to 2018 and RAGS!

- Mrs. Kim Velez who was an integral part of Project RAGS insisted that a soil test be completed for possible contamination. I agreed as some staff members felt that we should plant vegetables in the soil garden.
- The test showed that the lead content was 408 ppm which is above the acceptable limit for planting any type of edible plants.

The Urban Soils Lab @ Brooklyn College
Soil Test Submission and Report Form

Sample ID	S0418-8	Date Received	
Name		Phone	* Email (to receive results)
Ellyn Kerr		718-789-1191	ekerr@schools.nyc.gov
Test Requested (check box)	<input type="checkbox"/> Lead and pH (\$20) <input type="checkbox"/> Basic soil quality test (\$55)	<input checked="" type="checkbox"/> Lead test with XRF (\$10) <input type="checkbox"/> pH (\$10) <input type="checkbox"/> Soil class (jar test) (\$10) <input type="checkbox"/> Soluble salts (\$10) <input type="checkbox"/> Organic content (\$12) <input type="checkbox"/> NPK kits (\$10)	
Total cost:	\$	\$10	
Mailing Address		Garden Address (if different from mailing address)	Sample Description (optional)
62 Park Place Brooklyn, NY 11217		Home garden [Y/N]? <input type="checkbox"/> School garden	

SOIL TEST RESULTS			
Lead (ppm)	408	Organic Content (%)	
pH		NPK Kit	N
Soluble Salts (ppm)			P
Soil Texture			K

Please check for general interpretations of data at our website <http://testmysoil.brooklyn.edu>. Send a message to soil@brooklyn.cuny.edu if you have further questions.

Project RAGS

- P77@902 co-located with another school in Sheepshead Bay for two years while the building was being renovated. We assumed that parts of the school grounds would not be in great shape upon our return and we were correct. The school garden was over grown with English Ivy. Garbage and construction debris was scattered throughout it, too.
- We were devastated and were wondering how would we get our Floral School Garden back to it's splendor.
- Ellyn Kerr, the former Sustainability Coordinator wrote a \$5000 NYCDOE Office of Sustainability grant which she was awarded. Thus we began to clean up and beautify the school garden.



The Clean Up!

- Students worked together to make RAGS a success. I was amazed at how well they all enjoyed working in the garden.



Some construction items found in the garden

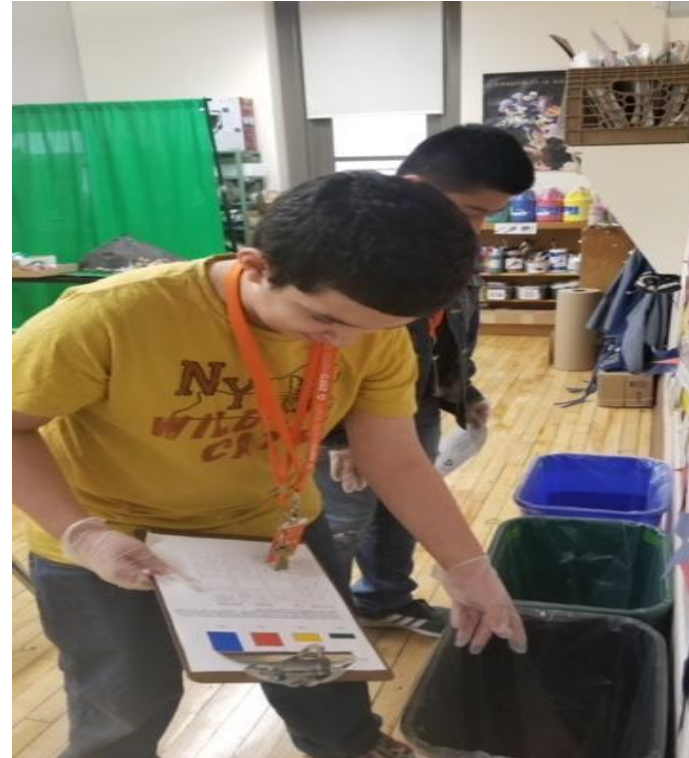


Students and staff working together!

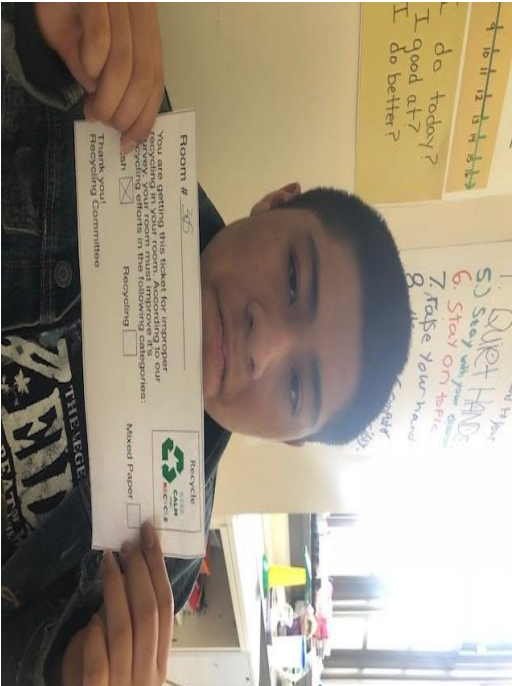


Recycling at 77K

- Students were given a tally sheet which was broken down into 3 categories using the following percentage which were color coded: 25%, 50%, 75% and 100%.
- Each class had a final tally and even ticket was issued for improper recycling.



Finally, then a possible ticket!



- Students from Mrs. Velez's class decided while recycling that they wanted to give classes that were not recycling correctly a ticket. A ticket was issued for any category that scored 50% or under.. The tickets were made out of index cards in the beginning. However, later on, a formal one was designed by Ms. Ellyn Kerr, the former Sustainability Coordinator.
- Criteria for the ticket was determined by the students.

Kudos's to all who participated in the 2017-2018 Sustainability Initiative

- Mrs. Kim Velez
 - Ms. Aleida Ward
 - Ms. Dawn Kerhonsen
 - Ms. China Brown
 - Ms. Chanel Lindsay
 - Mr. Jason Corley
 - Danielle Boree
 - All of the P77K students and staff who participated in the garden and recycling projects.
- P.77K Administrators
 - Mrs. Ebony Russell, Principal
 - Assistant Principals
 - Ms. Carmela Montanile
 - Mrs. Marisa Beharry-Vanzie
 - Mrs. Allison Nadage

What is Happening at P77K Now?



Team DOPE

- Classes X03 and X04 have joined forces to create a mini Sustainability Team named Team DOPE (Defending Our Planet and Environment).
- Team DOPE was created to continue bringing environmental awareness to our school, monitor recycling efforts, and stress the importance of reducing the use of plastic.



Say **No** to Plastic Pledge

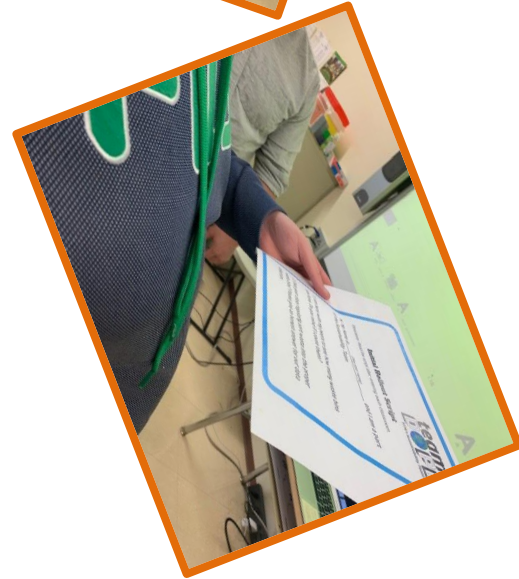
- The students of class X03 and X04 have taken a pledge to say “No” to plastic water bottles and “Yes” to refillable water bottles.
- We have taken this pledge to assist in reducing the amount of plastic we use in our everyday lives in order to help save our ecosystem and marine life.



Garbage Check



- As a part of our initiative to reduce plastic water bottle use, Team DOPE (Defending Our Planet and Environment) has revamped our garbage checking system.
- Team DOPE evaluates each of the three garbage bins (Trash, Mixed Paper/Cardboard, and Metal/Plastic) located in every classroom, biweekly, to determine if the garbage disposed in those classrooms has been sorted appropriately.
- To record their findings, the team uses a data sheet that tracks how well the citizens of each class have sorted their trash with a special focus on plastic water bottle use/disposal.
- Lastly, the team members evaluating the bins ask the classes to promise that they will start/continue to recycle correctly.



Data Collection

- All of the data that has been collected will be closely evaluated by Team DOPE.
- The members of the team will compare and contrast the data collected to determine the progress each participating class has made from January to April.
- We aim to present our data to the school during our Earth Day celebration.



Refillable Water Station

- We are excited to announce that we have been awarded the Refillable Water Station Grant funded by the Office of Sustainability!
- Team DOPE, Ms. Jazz, and Ms. Sarah committed to developing a plan to reduce plastic water bottle use and were able to convey all of our ideas in our grant proposal.
- We are thrilled that the students will be able to utilize their water bottles and refill them without difficulty in a communal area that is accessible to the entire school.
- Team DOPE is also eager to unveil the station to the entire school with their “Say No to Plastic” Campaign this spring!



Special Thanks

- We would like to give a special thanks to all who have helped P77K bring about sustainability awareness. We appreciate you all and we will continue to advocate for a more well-balanced environment.



The image features a deep blue background with a view of Earth from space, showing the curvature of the planet and the dark void of space. At the bottom, there is a white silhouette of a city skyline with various skyscrapers. The word "Questions?" is written in a large, white, sans-serif font in the center of the image.

Questions?

The background of the slide is a blue-tinted image of the Earth as seen from space, showing the curvature of the planet and the atmosphere. At the bottom of the image, there is a white silhouette of a city skyline, likely representing New York City, with various skyscrapers of different heights and shapes.

THANK YOU

Please visit www.tc.columbia.edu/sustainability