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Tending Our Common Ground, www.TendingOurCommonGround.com

Presidential Innovation Award for Environmental Educators

Sample Teaching Materials

Clean Air Unit (3rd Grade)

Focus Standards

- Science: S3L2. Students will recognize the effects of pollution and humans on the environment.
- Math: CCSS.Math.Content.3.OA.A.3. Use multiplication and divisions within 100 to solve word problems in situations involving equal groups, e.g., by using drawings and equations to represent the problem.

Engage: Connection to Current Events

“How the Bicycle Can Drive Green Development on Planet Earth”

Students will work in small groups to read “How the Bicycle Can Drive Green Development on Planet Earth” (written by Leszek Sibilski for Brookings.com on March 12, 2015 <http://www.brookings.edu/blogs/future-development/posts/2015/03/12-cycling-future-development-sibilski>). They will work together to answer the questions of how the bicycle can drive green development and why it is important to make changes. After sharing group discussions, the teacher will highlight one sentence from the article for further discussion: “One-third of U.S. carbon dioxide emissions are from motorized transport, yet half of all car trips are just 5 km or less. Such a distance takes only 15 minutes on a bike.”

Explore: Engineering Challenge

Air Quality Test (www.tryengineering.com)

<http://tendingourcommonground.com/2015/03/04/air-quality-testing-with-ms-slacks-5th-graders/>

Teams of students will work together as teams of engineers to detect the presence of pollutants in the air by constructing an outdoor air pollution detector from everyday materials such as construction paper, cardboard, plastic wrap, wax paper, fabric, felt, coffee filters, index cards, paper plates, paper cups, scissors, double-sided tape, petroleum jelly, string, etc. Their detectors must have a flat collection area of at least 5 cm x 5 cm along with having relative protection from the elements and being secured.



The groups will each place the detector they created in a different location around the school campus (playground, parking lot, etc). After 72 hours, students will examine the particulate matter collected by their devices using hand lens (or microscope). Students will record and describe all the different types of particles they see (dust, pollen, dirt, etc.) in terms of size, color, shape, and texture.

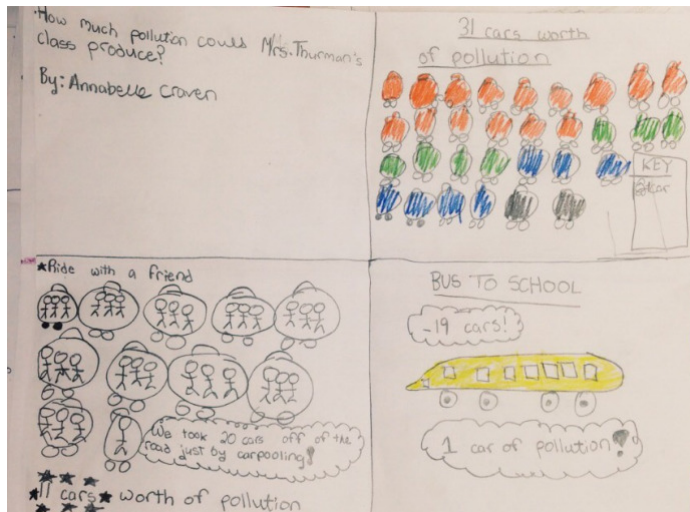
Explain: Math Integration

Division Project

<http://tendingourcommonground.com/2015/03/04/math-lessons-air-pollution/>

This project aims to show students that the small choices they make can add up to make a big difference while reinforcing their understandings of division. To begin this project, students model what it would look like if each of them individually took their cars to school (pretending to drive around the classroom). Students can determine that the choice of driving individually would create 31 “cars worth” of pollution, as an example as shown below in the class of 31 students. Then we discuss carpooling. Under the assumption of being able to fit three children in each car, students use informal division strategies to organize themselves into groups of three to

determine that they would only create 11 “cars worth” of pollution in that position in this example. They can also calculate that their choice to carpool took 20 “cars worth” of pollution off the road. In the next scenario, students model all of them getting into a school bus which would create only one “car worth” of pollution, taking a total of 30 cars off the road in this example. The teacher can also go a step further and challenge the student to think about how they can get from place to place in way that creates zero pollution - walking, biking, etc.



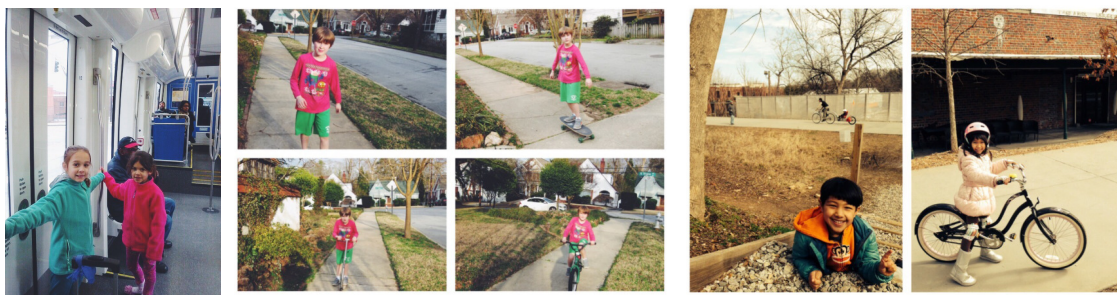
This project can be modeled as a whole class but then to assess individual students’ understanding of division and the effect of our choices on air quality, students can individually calculate how many “cars worth” of pollution would be created by the entire grade level (up to 100 students) in each scenario if each student chose to drive individually, carpool, ride a bus, or walk and bike.

Extend: Real World Connections

Home School Connections

<http://tendingourcommonground.com/2015/03/02/home-school-connection-preventing-pollution/>

Students are challenged to take the concepts that they discovered school and share the information with their family, friends, and neighbors while being a leader in creating these habits within their family and neighborhood. They are encouraged to submit photos of what they are doing to prevent air pollution to post on the website and share with their classmates.



Walk to School Day (Spring and Fall)

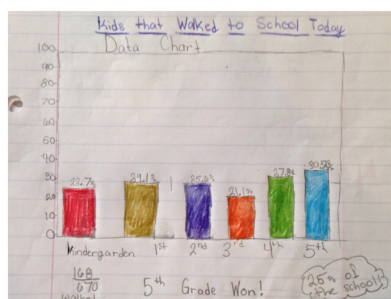
<http://tendingourcommonground.com/2015/03/06/save-the-date-walk-to-school-day-on-march-4/>

One of our community's favorite events every season is Walk to School Day. We host this event in conjunction with the Clean Air Campaign and Georgia Safe Routes to School. Last fall, our SPARK Walk to School Day was the week following the Atlanta Streets Alive event in our school's neighborhood. Atlanta Streets Alive is an event in which the streets in one neighborhood are closed to cars and open to people for one specific day to encourage community members to explore their streets in a safer, healthier, and more livable way. Our neighborhood's Atlanta Streets Alive event last October brought 106,000 attendees to the streets - almost 25% of the entire city! Our goal at Springdale Park was to beat that amount of participation and we came out at 25.1% participation throughout the school!



Kth 32 students out of 135 = 23.7% of the grade
1st 29 students out of 120 = 24.1% of the grade
2nd 29 students out of 113 = 25.6% of the grade
3rd 23 students out of 109 = 21.1% of the grade
4th 29 students out of 104 = 27.8% of the grade
5th 26 students out of 86 = 30.2% of the grade

5th grade got the highest % but lets
give a clap to everybody who walked
to school actually 168 students out of
670 walked! That's 25.1% of the school!



These events are also great opportunities to reinforce collecting and analyzing data in a way that keeps students motivated to create high quality work - they truly want to know which teacher and grade level had the highest participation and if our school beat our last record. Students start by going to each classroom to collect data on a tally chart that they then translate into percentages for the classes and grade levels. When they have finished their data collection and percentage calculations, they can publish their information in a bar graph or chart.

Evaluate: Writing Integration / Art Integration

“Young Lungs at Work” Art Competition with the Clean Air Campaign



To conclude our Clean Air Unit, students have the option of completing a submission to the “Young Lungs at Work” Art Competition sponsored by the Clean Air Campaign. Their six-frame comic must begin with a “Problem” (depicting where pollution comes from and how it is harmful) and end with a “Solution” (showing behaviors that prevent air pollution). They must show an

appropriate setting and characters that engage in meaningful dialogue. Our students have enjoyed this alternative method of assessment each year and our very motivated by the state-wide contest they can be a part of - last year our school even had a winner!

Persuasive Letter to Mayor Kasim Reed

Students can also choose to write a persuasive letter to Mayor Kasim Reed about ideas they have to reduce air pollution around Atlanta. This reinforces the skills of both persuasive writing and letter writing while evaluating students’ understanding of their science standard focused on air pollution.