

Engines Off at School Overview

In 2024, the Regional Air Quality Council (RAQC) initiated [Engines Off at Schools](#), an educational program about the negative impacts of vehicle idling targeted at elementary school communities. The RAQC developed the program by borrowing elements of the EPA's [Idle Free Schools](#) toolkit and the City of Denver's [Love My Air](#) program. The components of the RAQC Engines Off program are:

- **Observations:** With volunteers, the number of cars idling at school pick up are counted for 4 or 5 days before the program begins, and then again once it has been completed. The volunteers collect data about what types of vehicles idle and for how long to calculate the amount of emissions being produced daily.
- **Educational Messaging:** Four months of weekly email, text message, and social media templates are available for school administrative staff to copy and send to parents, teachers, and the entire school community. The messaging focuses on the contribution that vehicle idling makes to the region's ozone pollution problem, its impact on children's public health, the financial costs associated with idling, and the climate impact of idling.
- **Anti-idling Sign Design:** Art teachers or classroom teachers can lead an art activity in which the students design anti-idling signs. The activity is accompanied by an age-appropriate lesson on air pollution and idling. The finished signs can be laminated and displayed on campus. The RAQC has funding to print the signs onto weather-proof yard signs for the school.
- **Anti-idling Pledge:** Parents and guardians are asked to sign a document pledging not to idle near the school or in their community. It is recommended that these pledges are distributed by the classroom teachers like field trip permission slips and turned back in once they are signed. They can also be sent out by the office staff via email.
- **Driver Contact Event:** A select group of students leave class early one day to stand in the parking lot and approach drivers at school pick-up who are idling. The students, under supervision, can hand out information about the negative impacts of idling.

Results of Pilot Program

The first RAQC Engines Off programs were tested at Lincoln Elementary and Montessori School and Park Hill Elementary School between February and May of 2024. Both are Denver Public Schools. Park Hill serves 650 students and Lincoln has 300 students. Both schools are in relatively dense residential areas, so many students bike and walk to school. At school pick up, parents and guardians park on all four sides of the schools, often idling, and wait for the bell to ring before exiting the car and retrieving their student.

The office staff send out a weekly newsletter to all parents and guardians. The Lincoln Ledger is sent out every Thursday, and the Park Hill newsletter is sent every Friday. Neither school is very active on social media. Lincoln parents and guardians can receive messages through an app, but it is usually reserved for very timely messages.

Lincoln Results

Lincoln opted into idling observations, email messaging, the anti-idle sign design contest, and the anti-idling pledge. The principal copied the email templates into the weekly Lincoln Ledger and

used about 3/4ths of them. The art teacher facilitated the anti-idling sign design for all classes. The posters were displayed in a hallway and students voted on their favorite signs on Earth Day. The pledge was distributed in the Lincoln Ledger.

According to the school principal, the email messaging was very easy and effortless to implement. The art teacher did the greatest share of the work and in the future it would be beneficial to bring them into the loop sooner so that they can incorporate the sign-design activity into their curriculum. The school principal also recommended that the school should have one teacher be an ambassador for the program, but only if compensated with a small stipend. Anecdotally, parents were often told by their students to stop idling, which was an effective means of changing behavior.

The observations at the start and end of the program were successful due to the participation of an active school crossing guard who organized volunteers from the PTA and neighborhood. The observations were the most time-consuming aspect of the program for the RAQC and cannot be replicated at every participating school. However, the results demonstrated that the program reduced idling at Lincoln’s school pick up by 45%. On average, parents and guardians idled their vehicles for 3.2 hours every day during school pick up before the program and idled for 1.4 hours after the program. Table 1 shows the annual emissions reductions while Table 2 shows the idling time reductions, both based on the data from Lincoln Elementary.

Annual Emission Reductions			
Pollutant	Grams/year	Percentage	Balloons
NOx	387	30%	38
CO	5,252	30%	593
VOC	101	20%	4
GHG	20,457,535	30%	1,470,830

Table 1: Annual emission reductions at Lincoln Elementary before and after the Engines Off program. Emission reductions are displayed in grams/year, percentages, and the number of balloons that could be filled with the pollutants for easier visualization of the impact. Data is from observations and the EPA, greenhouse gases (GHG) emissions are well to wheel calculations.

Idling Time Reduction		
Hours idling	Percentage	Hours
Per Day	45%	2
Per Year	45%	302

Table 2: Idling time reduction at Lincoln Elementary before and after the Engines Off program.

Park Hill Results

Park Hill opted into observations, email messaging, the anti-idle sign design, and the anti-idling pledge. They introduced the program by sending an individual email to parents and guardians, followed by anti-idling email templates weekly in the newsletter. Teachers introduced the programs to students in the classrooms and then sent flyers home about the program to their parents. Office staff sent the pledge out to parents and guardians in an individual email. The art teacher facilitated the anti-idling sign design only with 4th and 5th graders. Two RAQC employees also handed out flyers and balloons advertising the program during school pick up one day in early March.

The school principal and assistant principal agreed that the messaging templates were very easy to implement, and only added a handful of hours of work in total throughout the course of the program. They also believed that the student involvement was the best part of the program, including the posters and the classroom introduction which inspired students to ask their parents to stop idling. They believe that long-term street signs would be effective reminders going forward and that a parade or some sort of demonstration by students would be impactful. RAQC staff should not table and hand out flyers at school pick up going forward because there was very little engagement from parents and guardians.

Park Hill observations were also time-consuming and required the participation of an active crossing guard and neighborhood and parent volunteers. The idling observations demonstrated that the program reduced idling at school pick up by 50%. Idling time was reduced from 5.9 hours/day on average to 2.9 hours/day at pick up. Table 3 shows the annual emissions reductions while Table 4 shows the idling time reductions, both based on the data from Park Hill.

Annual Emission Reductions			
Pollutant	Grams/year	Percentage	Balloons
NOx	973	31%	95
CO	13,345	31%	2,567
VOC	244	32%	9
GHG	51,364,671	31%	3,692,235

Table 3: Annual emission reductions at Park Hill Elementary before and after the Engines Off program. Emission reductions are displayed in grams/year, percentages, and the number of balloons that could be filled with the pollutants for easier visualization of the impact. Data is from observations and the EPA, greenhouse gases (GHG) emissions are well to wheel calculations.

Idling Time Reduction		
Hours idling	Percentage	Hours
Per Day	50%	3
Per Year	50%	516

Table 4: Idling time reduction at Park Hill Elementary before and after the Engines Off program.

Key Takeaways

- The email templates provided an effective means of educating the school community about idling and are easy for staff to implement. This element of the program may be easy for school staff to sustain without RAQC engagement. This should be a priority.
- When sent out to the school community via email, the anti-idling school pledge was not very successful. If this activity is pursued, the pledge should be printed and given to parents and guardians in another format.
- The anti-idling sign design was a success and relies on the participation of art teachers. Art teachers should be included in discussions about Engines Off at the start of each semester so that they can incorporate the activity into their lesson plan.

- Student engagement is a key component of the program's success. Introducing the program in classrooms, the sign design contest, and potentially a driver-contact event are good methods of accomplishing this.

Going forward

- Have the email messaging a permanent fixture at Park Hill and Lincoln going forward.
- Host a few driver-contact events at newly participating schools to test their efficacy.
- Introduce a survey for parents to take towards the end of the program to see if they are aware of the negative impacts of idling and if so, what outreach methods impacted them most.
- Schools that have messaging through apps or that send text reminders should be encouraged to use these modes of communication for anti-idling outreach.
- Focus more on the anti-idling sign design – including having the best posters printed as yard signs for the school – and less on the anti-idling pledge.
- Expand to schools that are more suburban and have a greater percentage of parents and guardians driving to school pick up.