

Casey's Clean Air Week

Parent/guardian/teacher guide *and*
activity book



This book was developed by the
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EXTENSION

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Parent/guardian/teacher guide

Casey's Clean Air Week helps young children and their adult caregivers understand the importance of clean air in protecting both human health and the environment. The book advises children and adults of simple steps they can take to help prevent or reduce air pollution when using automobiles.

How does air pollution from motor vehicles affect health?

In many states, the personal automobile is the single greatest air polluter. The exhaust from cars, buses, trucks, and other vehicles contains both gases and particles that are unhealthy to breathe. Children, the elderly, and people with asthma or other health problems are especially vulnerable to harm from the products in motor vehicle exhaust. According to a 2013 study by researchers at the Massachusetts Institute of Technology, motor vehicle emissions contribute to an estimated 53,000 early deaths in the United States each year.

Pollution from motor vehicles can cause nose, throat, breathing, and eye problems. It may cause or worsen such illnesses as **asthma**, other lung diseases (such as emphysema and chronic bronchitis), heart disease, lung cancer, and other forms of cancer.

Children's lungs are especially vulnerable to the harmful effects of air pollution because

- Their lungs are still developing.
- On average, children breathe faster than adults do.
- On average, children breathe more air per pound of body weight than adults do.
- Children are closer to the ground and are therefore closer to tailpipes and their exhaust.

Asthma

A serious lung disease that makes breathing difficult

The most common chronic illness in children

The cause of most school absences

Children's asthma symptoms increase from exposure to car exhaust.

Why is idling a problem?

Idling gets you nowhere

Idling occurs when a driver leaves the engine running and the motor vehicle is not moving. Every day, millions of cars and trucks idle needlessly, sometimes for hours. In fact, according to the U.S. Department of Energy, idling from personal vehicles wastes an estimated 3 billion gallons of fuel each year (enough to fill 4,500 Olympic-size swimming pools).

An idling car can emit as much pollution as a moving car, and its tailpipe spews the same pollutants that a moving car emits. The unhealthy pollutants include a long list of chemicals, such as

- Hydrocarbons, which react with other chemicals to produce ozone, which irritates the respiratory system

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- Nitrogen oxides, which irritate the lungs and weaken the body's defenses against pneumonia, influenza, and other respiratory diseases
- Carbon monoxide, which blocks oxygen from reaching the brain, heart, and other organs
- Sulfur dioxide, which reacts to form very small particles and is especially dangerous to young children and people with asthma
- Toxic chemicals like benzene, which have been linked to cancer, birth defects, and other serious illnesses
- Small particles that can penetrate deeply into the lungs
- Greenhouse gases, such as carbon dioxide, which contribute to climate change

Join the
pollution
solution

The key message in *Casey's Clean Air Week* is to avoid idling whenever safe and possible. By turning off your engine at appropriate times when your car is sitting still, you will contribute in three areas:

Health

- **Avoid damaging the lungs of both children and adults**

Air pollution is especially hard on the young, the elderly, people with asthma, and people with other serious health problems. If you sit in an idling car, you may breathe in dirty, unhealthy exhaust that leaks into the car cabin.

Money

- **Save money on fuel**

Idling a car just six minutes a day adds up to more than 30 hours (or about 10 gallons of fuel) per year, according to the U.S. Department of Energy. Keep in mind that idling gets you **zero miles per gallon**.

- **Save money by reducing wear and tear on the car**

Idling increases the costs of maintaining a car and can shorten the car's life.

- **Save money by avoiding fines**

In some locations, idling is illegal and could result in fines.

Environment

- **Avoid polluting the air**

For every 10 minutes you run your engine, your car puts one pound of carbon dioxide into the air. Carbon dioxide is a greenhouse gas that contributes to climate change.

Do your share
for cleaner air

How can drivers avoid idling?

Turn off your engine if you have to wait more than a few seconds

- Contrary to popular belief, restarting your car does **not** burn more fuel than leaving it idling. In fact, idling for just 10 seconds wastes more gas than restarting the engine.
- In modern cars, frequent restarts are not hard on a car's engine and battery.
- You can still use your audio features when your engine is off by using your car's accessory mode.
- Examples of times you should avoid idling include
 - While waiting to pick up a child from school
 - While waiting to meet a co-worker in a commuter lot
 - While waiting in the car for a friend to buy an item from a convenience store

Of course, there are times when you *should* keep your engine running for safety, such as

- While waiting at a traffic light
- While stuck in traffic on the road
- While waiting for the windshield to defrost so you can see clearly
- While waiting at a drive-through
- When you need to operate the heat or air conditioning to protect the health or safety of the driver or passengers

Warm up your car by driving it, not by idling

- Modern engines do not need to warm up by idling, even in winter.
- The best way to warm an engine is by starting to drive slowly and by avoiding revving the engine. Your vehicle is safe to drive after just a few seconds.
- The engine warms twice as fast when it is driven.
- Not only will the engine warm up faster, but the car interior will warm up more quickly as well.

Change some of your driving habits

- If you are parked and waiting, instead of idling your car to stay warm or cool, get out of your car and go inside a store or other building.
- Use the remote car starter only when necessary.
- When it's time to buy a new car, consider buying an electric car or one with stop/start technology, which automatically limits idling at traffic stops.

What are the advantages of an electric vehicle?

Consider an electric vehicle

An electric vehicle (or EV) is any vehicle that uses electricity to power the motor that moves the vehicle. The electricity often comes from a battery, which is charged by plugging the vehicle into an electrical power source, such as a typical household electrical outlet or an EV charging station.

An electric vehicle offers many advantages. Below are just a few.

An EV is frugal with fuel

- Although electricity isn't free, an EV is more efficient than a gasoline-powered car and is therefore far less expensive to run.

An EV requires less maintenance

- A vehicle powered solely by an electric motor requires no lubrication, which means no oil changes. EVs also have fewer moving parts, another feature that reduces maintenance.

An EV is convenient

- You can charge an EV anywhere and save time. Plug your car into any standard household outlet overnight, and zoom off to work or errands the next day without needing to stop at a gas station.

An EV produces no or low emissions

- Driving an EV helps you contribute to a healthier planet. Producing electricity to power a car results in less air emissions than does burning gasoline to power a car.

Many states offer rebates to reduce the cost of buying and owning an EV

With their cutting-edge technology, EVs are the cars of the future, and the future is now. Several types are now available.

Battery Electric Vehicle (BEV)	Plug-in Hybrid Electric Vehicle (PHEV)	Fuel Cell Electric Vehicle (FCEV)
<ul style="list-style-type: none">• Uses large batteries to power an electric motor; there is no gasoline-powered engine• Produces no tailpipe emissions, although the power plant that produces the electricity may produce emissions• Fuel source: electrical outlet or EV charging station	<ul style="list-style-type: none">• Contains both a battery-powered electric motor and a gasoline-powered engine• Can drive on electricity alone and will seamlessly switch from electricity to gasoline• When operating in electric mode only, produces no tailpipe emissions• Fuel source: electrical outlet, EV charging station, and/or gas station	<ul style="list-style-type: none">• Generates electricity through a chemical reaction• Produces no harmful tailpipe emissions: the only emission is water• New to the market, and technology and infrastructure are still developing• Fuel source: hydrogen refueling station

How to use this activity book

Use this activity book after you have read the story with your child. Help your child with the activities if necessary, and refer back to the story if you have any questions.

Resources

- For a national list of idling limits, see
ATRI (American Transportation Research Institute), Compendium of Idling Regulations
<http://atri-online.org/2014/10/20/idling-regulations-compedium>
- For air quality information for children, see
U.S. Environmental Protection Agency, AirNow/Kid's Air
http://www.airnow.gov/index.cfm?action=aqikids_home.index
- For information about Connecticut's environment, see
Connecticut Department of Energy and Environmental Protection
<http://www.ct.gov/deep>
- For other information about energy and idling, see
U.S. Department of Energy
www.energy.gov

Activities for Children

Safe-air Sunday

Meet the Careful family and their car, Casey

Double scramble

Casey and his family are always thinking about the air everyone breathes. Below are some of the words that help them think about clean air.

Unscramble each of the clue words. Then copy the letters in the numbered boxes to the boxes at the bottom with the same number. Then you'll see Casey's goal.

KEIB
6

REHTABE
5

SUB

ACR
1

REVDI
7

GSA
4

LEID
2

RIET
3

N
1 2 3 4 5 6 7

The answer key is at the end of this booklet.

Move-on Monday

To keep pollution out of the air, Casey doesn't idle

Pretend to be a member of the Careful family

Pretend to be one of the characters in this story: Mom, Dad, Henry, Susie, Grandma, or Casey the car.

Pretend that you are taking a trip in a car. Instead of actually driving, though, you'll be taking an imaginary trip around your room, several rooms in your home, or your classroom.

Think of several reasons you might take a car trip.

- To go to school and then to a friend's home
- To go to the library, the grocery store, and then a relative's home
- To go to the hardware store to buy an extra snow shovel, and then go to Grandma's house to shovel her sidewalk
- To go to a restaurant and then to the park

Plan a trip that involves stopping at several places. These are places where you can turn off the car and not idle.

Here are some suggested places:

- Your school
- The library
- A grocery store
- A hardware store
- The recycling center
- Grandma's home
- Friends' homes
- A restaurant
- A park
- A playground

Can you think of other places you would like to go in a car?

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Imagine that different areas in the room are places you might stop. For example, maybe a chair will stand for your school, and maybe a window will stand for the grocery store.

Move around the room, either driving (if you've chosen to be Mom, Dad, or Grandma), riding as a passenger (Henry or Susie), or moving like a car (Casey).

Each time you stop, pretend to turn off the car, so you are not idling. Each time you stop, you can say, shout, or sing: "Idling gets you nowhere!" If you like, you can do a short happy dance at this time.

Count slowly to ten, and then move to the next place on your trip.

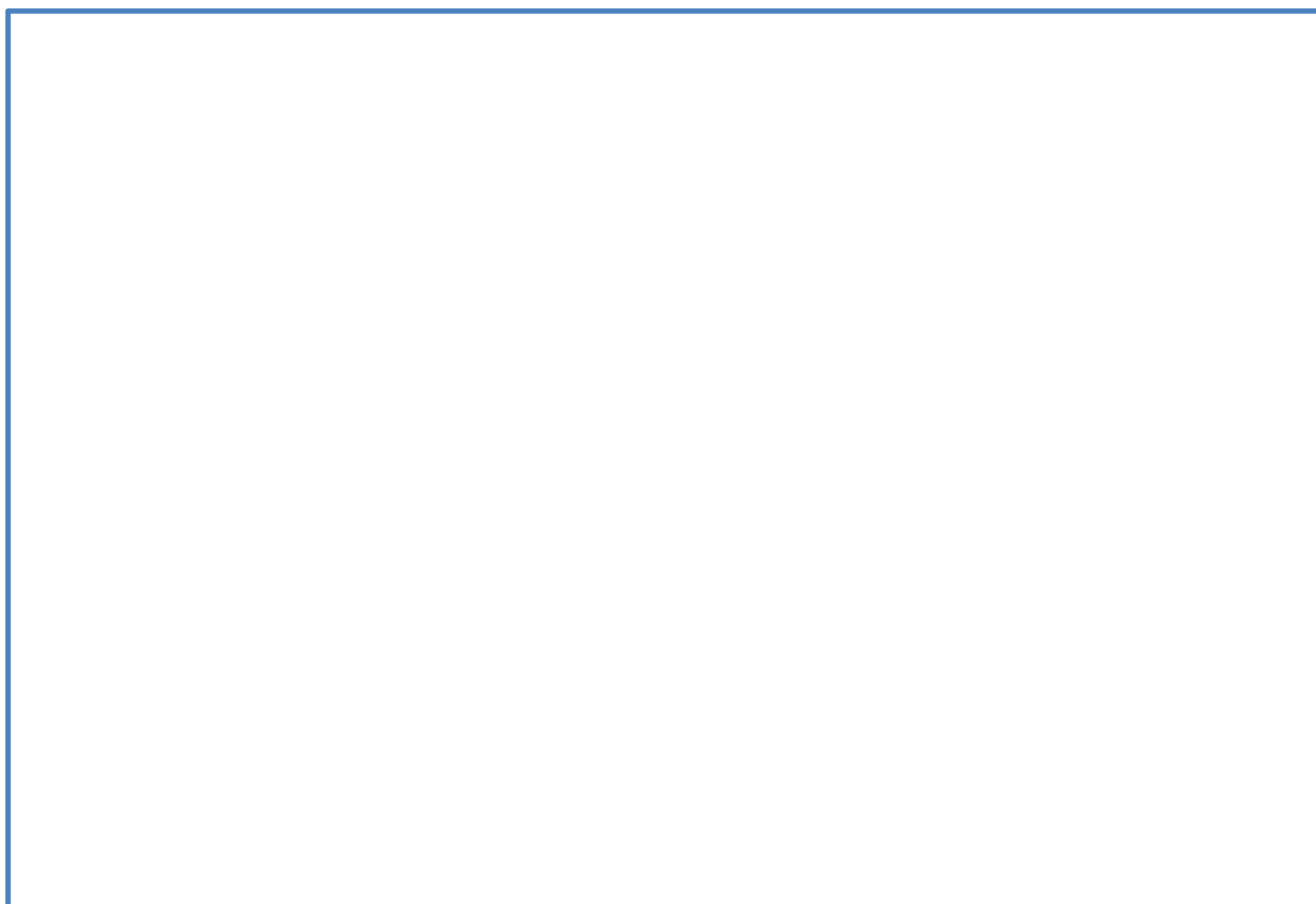
Tune-up Tuesday

To keep running clean, Casey gets a tune-up

Getting a car checked by an automobile mechanic (or another adult) is like getting your teeth checked by the dentist. Regular checkups of your car or your teeth help to make sure that everything is working well.

A tune-up (which is often called *maintenance* or *service*) makes sure that a car is running properly. Every car has an owner's manual that tells what services are needed and when they are needed. Service helps the engine use fuel efficiently (which means not wasting fuel). It also helps the engine put as little pollution into the air as possible.

Below, you can draw a picture of Casey at the garage, where a mechanic can check him.



Waste-free Wednesday

To save gas, Casey combines trips

To reduce waste, Casey recycles

Combining trips

1. What are your favorite places to travel? Below are some places that many children like to visit. Check off your favorite places, or write the names of other places that are not on the list.

- A beach
- A family member's home
- A friend's home
- A grocery store
- A hardware store
- A library
- A park
- A playground
- A restaurant
- A toy store
- Other places (write what they are): _____

2. Now write about an imaginary trip to three of your favorite places. Fill in the blank spaces below.

First, I am going to	I am going there because	The people who will go with me are	When I get there, I will

Second, I am going to	I am going there because	The people who will go with me are	When I get there, I will
Third, I am going to	I am going there because	The people who will go with me are	When I get there, I will

Recycling

1. What is recycling?

- Getting back on your bicycle after you fall off
- Making something new from something that has already been used
- Riding a bike in a circle
- Remembering to put your bicycle away

The answer key is at the end of this booklet.

2. How can you help your family to recycle? Check off all the ways you can help.

- Collect old newspapers and magazines from around the home
- Collect empty plastic food and drink containers from around the home
- Help rinse out empty plastic food and drink containers before putting them in a recycling bin
- Help flatten cardboard boxes before putting them in the recycling bin
- Make a poster listing all the things that should be recycled
- Remind everyone to recycle
- Other ways (write what they are): _____

Using an electric car

Lexie is an electric car that is powered by a battery.



1. Can you think of other things that are powered by batteries?

Below, list as many battery-powered things as you can. Then circle your favorite things.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

2. A new electric car

Can you invent your own electric car? What would it look like? How would it work? You can draw a picture or write about it in the box below.

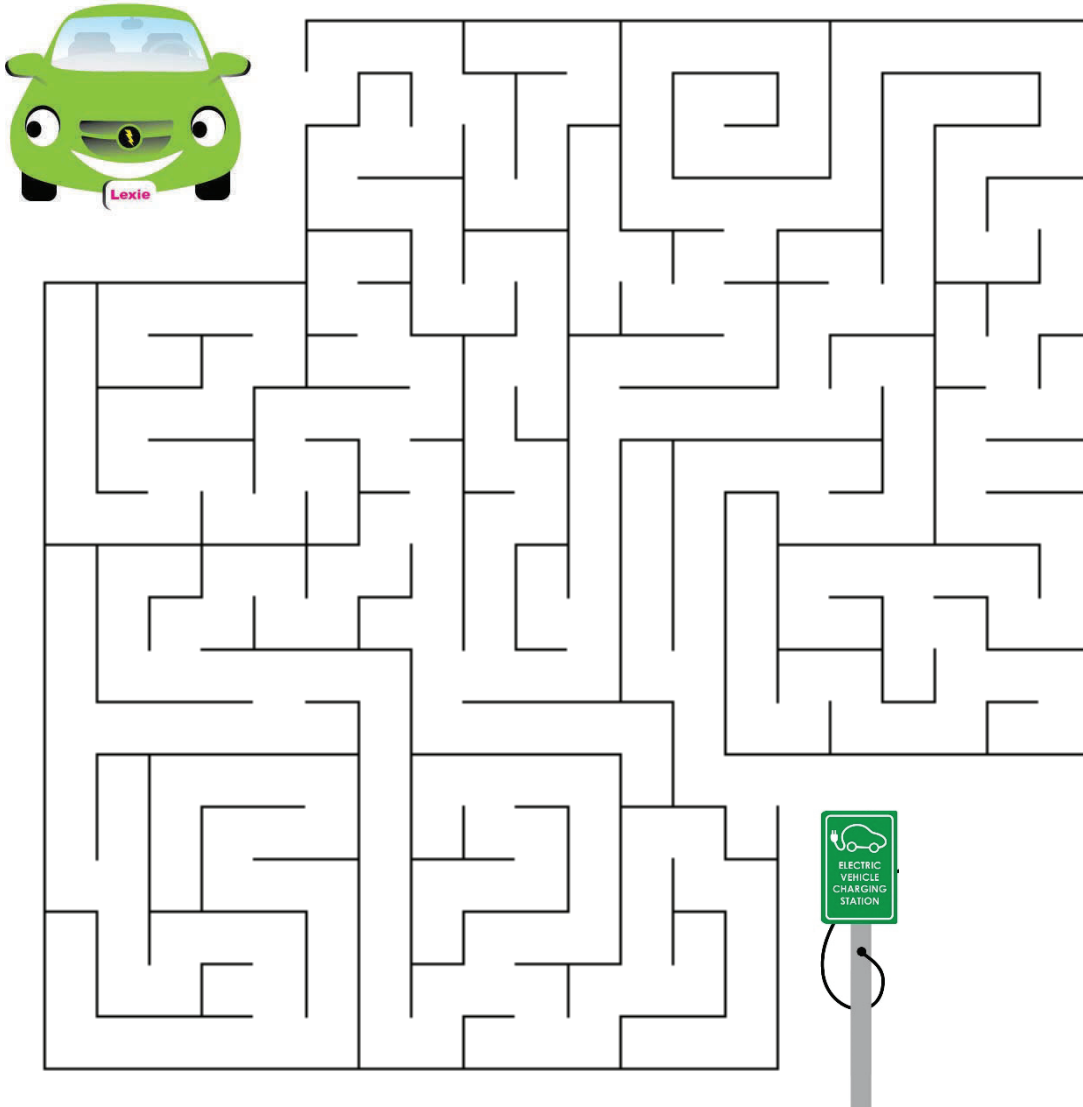
Here are some things to think about:

- What would you call your car?
- What color would your car be?
- How many people could fit inside your car?
- How far could your car travel before you needed to recharge its battery?
- Where would you plug in your car to recharge its battery?
- How will your car help to keep the air clean?

My Clean-Air Car

3. Can you help Lexie, the electric car, drive through the maze to find a place to charge her battery?

The solution to the maze is at the end of this booklet. Don't peek at the solution until you have tried to solve the maze on your own.



Thrifty Thursday
To save gas, Casey carools

1. What is a carpool?
 - A flood of cars
 - A swimming pool for cars
 - A way of sharing a car ride with other people
 - An underwater road

The answer key is at the end of this booklet.

2. With what people can you carpool and when?
For example, can you carpool with a neighbor to a friend's birthday party?
Can you carpool with a friend to a sports event?

Try to think of at least three times you can carpool. Complete the sentences below:

I can carpool with _____ to go to _____.

I can carpool with _____ to go to _____.

I can carpool with _____ to go to _____.

Car-free Friday

The Careful kids bike instead of riding in the car

Many times people have to use a car to get from one place to another. But sometimes we can find other ways to travel.

In the word search below are ten other ways to travel from one place to another:

bike

march

train

bus

run

walk

hike

skate

hop

skip

How many words can you find? Circle the words that you find. The words may go up, down, forward, or backward.

C A S E Y

S U Q J C U X Q B H O P
H K C H I K E H L W
B I K E X K X S Y A F C N
A R P S Q D K Y U X V B H R L U R V U
L Q C E T A K S X C D Q Y A K G U Z S E
B U S G T R I A I Y P N K I T W R N H F U
I H C R A M O W Y M T R A I N N N T C P H
P E F W Z K B F
F W L Y

The answer key is at the end of this booklet. Don't peek until you have tried to solve the word search on your own.

Share-the-Message Saturday

Casey shares the clean-air message with cars everywhere

Here's a song that Casey and his family sing. You can sing it too, using any tune that you like.

- Can you add any verses that will help remind you and your family to keep the air clean?
- Can you sing this song at your school and tell other children and teachers what it means?

Keep the Air Clean Song

Let's keep the air clean, Cathleen.

Turn off your engine, Benjamin.

Just turn it off now, Tao.

Don't you dare idle, Fido.

Let's keep the air clean, Dean.

Don't make us cough, McGoff.

Keep our lungs healthy, Elsie.

Keep our hearts hearty, Marty.

Let's keep the air clean, Gene.

So we'll all breathe easier, Caesar.

And beat heart disease, Louise.

And keep our whole selves healthy, Kelsey.

Let's keep the air clean, Darlene.

Help reduce asthma, Casper.

Head off the inhaler, Taylor.

Please don't make us wheeze, Jeeves.

Let's keep the air clean, Maxine.

We can save our folks cash, Nash.

By not wasting gas, Cass.

And by saving car parts, Bart.

Let's keep the air clean, Arlene.

Make soot disappear, Dear.

Make smog slip away, José.

Eliminate some ozone, Joan.

Let's keep the air clean, Pauline.

Let's keep the air safe, Rafe.

Let's lower pollution, Lucian.

Let's save the earth's air, Claire.

Answer Key

Safe-air Sunday

Double scramble

bike
breathe
bus
car
drive
gas
idle
tire

Casey's goal: Clean air

Waste-free Wednesday

What is recycling?

The correct answer is in red below.

Recycling is

- ~~Getting back on your bicycle after you fall off~~
- Making something new from something that has already been used
- ~~Riding a bike in a circle~~
- ~~Remembering to put your bicycle away~~

Thrifty Thursday

What is a carpool?

The correct answer is in red below.

A carpool is

- ~~A flood of cars~~
- ~~A swimming pool for cars~~
- A way of sharing a car ride with other people
- ~~An underwater road~~

Car-free Friday

Word search

The answer words are in red below.

C A S E Y

S U Q J C U X Q B H O P
H K C H I K E H L W
B I K E X K X S Y A F C N
A R P S Q D K Y U X V B H R L U R V U
L Q C E T A K S X C D Q Y A K G U Z S E
B U S G T R I A I Y P N K I T W R N H F U
I H C R A M O W Y M T R A I N N N T C P H
P E F W Z K B F
F W L Y
