Lesson Plan: The Science of Safe Air

Grade Level: 4–8
Time Needed: 40–50 minutes
Objective: Students will learn what carbon monoxide (CO) is, how it's produced, why it's dangerous, and what actions to take to stay safe.

Key Messages

1. Carbon monoxide is created when fuels don't burn completely (incomplete combustion).
2. It has **no color, no smell, and no taste** — making it very hard to detect without alarms.
3. CO exposure makes people **sick (headache, nausea, dizziness)** and can be deadly.
4. CO alarms and safe habits protect us at school, at home, and in the community.

Materials Needed

- A candle in a jar (or a video of flame consuming oxygen).
- Diagram or image of common CO sources (cars, stoves, furnaces, generators). You can use the CO Safe Schools sources page.
- Example CO alarm (real or photo, but preferably you're showing the ones that actually exist in your school or home).
- Large sheet of paper or whiteboard for "CO Risk Zones."
- Printable "Family Safety Checklist."

Lesson Outline

1. Invisible Trouble (5 minutes)

- Ask: “What are some things we can see that might be dangerous?” (fire, broken glass).
- Then ask: “What about things we *can’t* see?” (germs, air pollution).
- Introduce CO: *“Carbon monoxide is called the invisible gas — no smell, no taste, no color — but it can make people very sick.”*

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2. How Gases Can Hide (5–10 minutes)

- Show the candle-in-a-jar demo (flame goes out as oxygen disappears).
- Explain: *“Sometimes air can change without us seeing it. CO is a gas that sneaks in when fuels burn without enough fresh air.”*

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3. Sources and Symptoms (10 minutes)

- Show pictures of sources: cars, gas stoves, furnaces, generators, buses.
- Ask students: “Where do you think CO could show up at school?” (cafeteria, boiler rooms, buses, etc). Here’s where.
- Discuss how CO makes people feel: headaches, dizziness, nausea, tiredness. It’s all based on their unique biology and how it responds at various levels of CO toxicity.
- Reinforce: If more than one person feels sick in the same place, it could be CO.

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4. Mapping Activity: CO Risk Zones (10 minutes)

- Hand out a simple floor plan of your school (or use a whiteboard sketch).
- Students work in groups to circle/label places CO could be a risk: kitchen, bus garage, boiler room, portable classrooms, science labs.
- As a class, share findings.

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5. Safety Response (5 minutes)

- Show or play the sound of a CO alarm, preferably, the one they'd hear if the CO alarm went off in your school or classroom.
- Practice response: *"Stop what you're doing. Evacuate the building. Then call 911."*
- Reinforce that alarms = protectors, not something to ignore.

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6. Take-Home Connection (5 minutes)

- Give each student a **Family Safety Checklist**:
    - Do we have CO alarms at home?
    - Do we know the alarm sound?
    - Do we know the symptoms of CO poisoning?
- Encourage them to talk about it with their family tonight.

Assessment / Learning Outcomes

By the end of the lesson, students will be able to:

- Explain how CO is produced and why it's hard to detect.
- Identify common CO sources at home and school.
- Recognize symptoms of CO exposure.
- Demonstrate the correct response to a CO alarm.
- Share safety knowledge with their families.

Printable: Family Safety Checklist

Student Name: _____
Date: _____

Carbon monoxide (CO) is often called the **“silent killer”** — you can’t see it, smell it, or taste it, but it can make people very sick. Use this checklist at home with your family to make sure you are protected.

✅ Do We Have CO Alarms?

- We have at least one working CO alarm on every level of our home.
- We have a CO alarm near every sleeping area.
- We test our CO alarms every month.
- We know what the alarm sounds like.

✅ Do We Know the Symptoms?

- Everyone in our family knows CO can make you feel **dizzy, sleepy, sick, or confused**.
- We know that if more than one person feels sick in the same place, it could be CO.

✅ Do We Know What To Do?

- If the alarm goes off, we will: **Stop what we’re doing, leave the building, and call for help.**
- We know never to ignore the alarm, even if we don’t smell anything.
- We know to call 911 or emergency services if someone feels sick.

✅ Are We Preventing CO at Home?

- We never use grills, ovens, or generators inside our house, in our garage, or on our covered porch; nor do we use them within 20 feet of our home.
- We keep cars and other gas-powered equipment turned off when inside garages.
- We have our furnace, fireplace, and appliances checked at least once per year by a professional.

Family Pledge:
We promise to keep our home safe from the “silent killer” by checking our alarms, knowing the symptoms, and acting fast if we hear a CO alarm.

Signature: _____