

Exercise 2E

From: Texas Natural Resource Conservation Commission
<http://www.tnrcc.state.tx.us/air/monops/lessons/>

AIR POLLUTION GREMLINS MATH LESSON

BACKGROUND

Air pollution threatens the health of human beings and other living things on our planet. Smog and other types of air pollution can lead to or aggravate respiratory, heart, and other health problems. It can particularly be harmful to people with existing lung problems. The Environmental Protection Agency has established national air quality standards for six air pollutants: carbon monoxide, sulfur dioxide, nitrogen dioxide, respirable particulate matter, ozone, and lead.

The Texas Natural Resource Conservation Commission (TNRCC) created the Air Pollution Gremlins to help teach children about these air pollutants.

MATERIALS

- Cranky Carbon Monoxide Math Problem
- Nasty Nitrogen Dioxide Math Problem
- Odious Ozone Math Problem
- Pesky Particulate Math Problem
- Smelly Sulfur Dioxide Math Problem
- Lumpy Lead Math Problem

Purpose

To introduce the students to the six criteria pollutants by working math problems.

GRADE LEVEL

1st grade

OBJECTIVE

Students will develop an organized approach to problem-solving.

Students will learn the characteristics of each Air Pollution Gremlin by reading each word problem.

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PROCEDURE

The teacher will read the word problems with the students. The students will use the pictures to help them solve the word problems about the Air Pollution Gremlins.

RESOURCE

Air Gremlins Poster, GI-174, TNRCC

The TNRCC created the Air Pollution Gremlins to help teach children about these air pollutants.



Cranky Carbon Monoxide - A colorless, odorless, poisonous gas produced whenever fuels are burned without enough air and come mainly from automobile exhausts.



Smelly Sulfur Dioxide - Produced from some power plants and factories and wherever coal and fuel oil are burned.



Nasty Nitrogen Dioxide - Released into the atmosphere when fuels are burned by cars, electric power plants, and other large industries.

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Pesky Particulate - Composed of fine solid or liquid matter suspended in the air or in an emission, such as from automobile exhausts. Particulate matter varies in size and includes dust, smoke, fumes, spray, mist, and fog.



Odious Ozone - An odorless, colorless gas formed by the reaction of sunlight and hydrocarbons in the air. These chemicals come mainly from automobile exhausts, industrial smokestacks, and power plants.

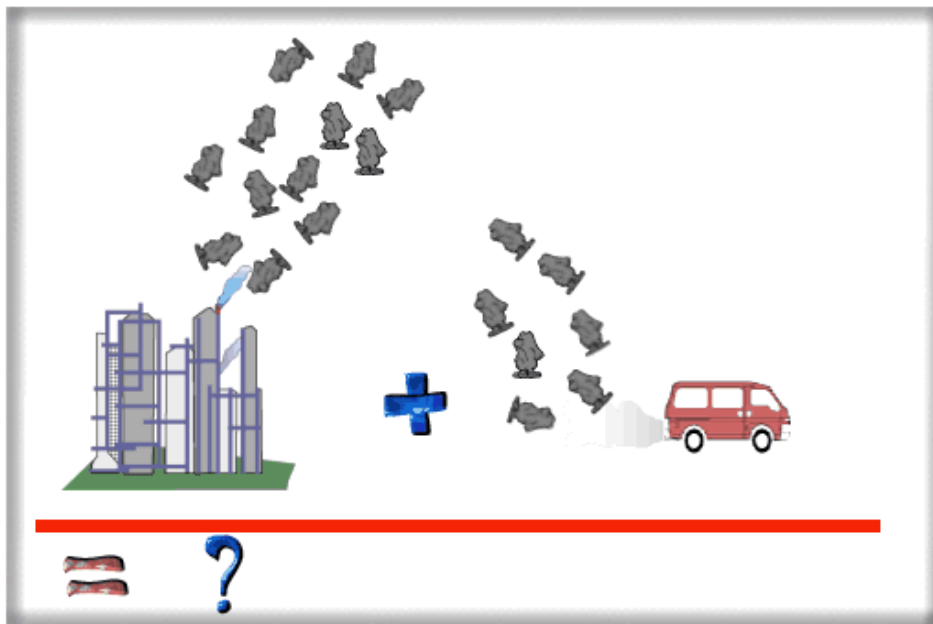
ACKNOWLEDGMENT

Celia M. Aguilar, University of Texas at El Paso TES Course, 1995

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CRANKY CARBON MONOXIDE MATH PROBLEM

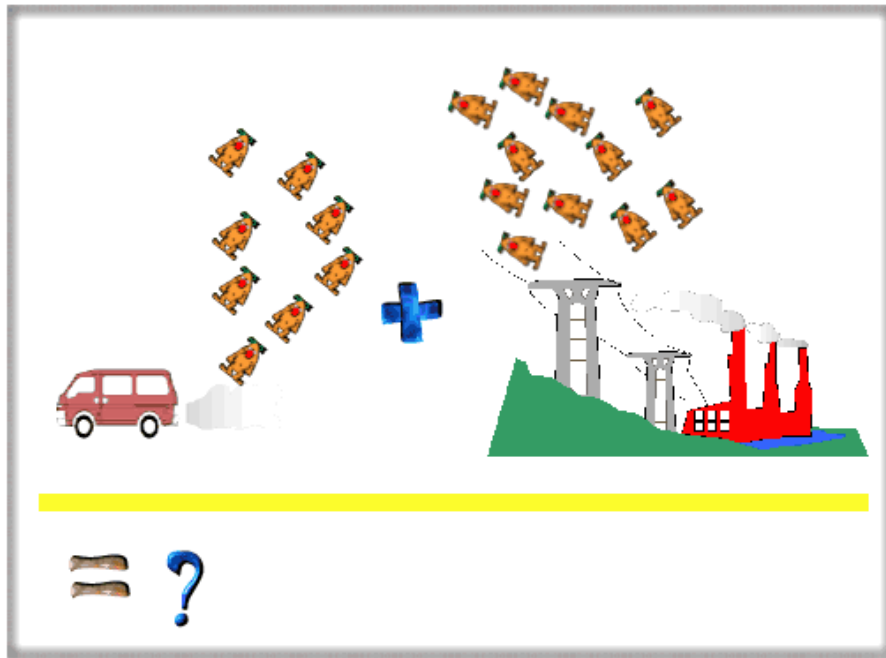


THERE ARE 12 INVISIBLE CRANKY CARBON MONOXIDE AIR POLLUTION GREMLINS COMING FROM WHEREVER FUELS ARE BURNED. SEVEN ARE COMING MAINLY FROM AUTOMOBILE EXHAUSTS. HOW MANY CRANKY CARBON MONOXIDE AIR POLLUTION GREMLINS ARE THERE ALL TOGETHER?

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NASTY NITROGEN DIOXIDE MATH PROBLEM

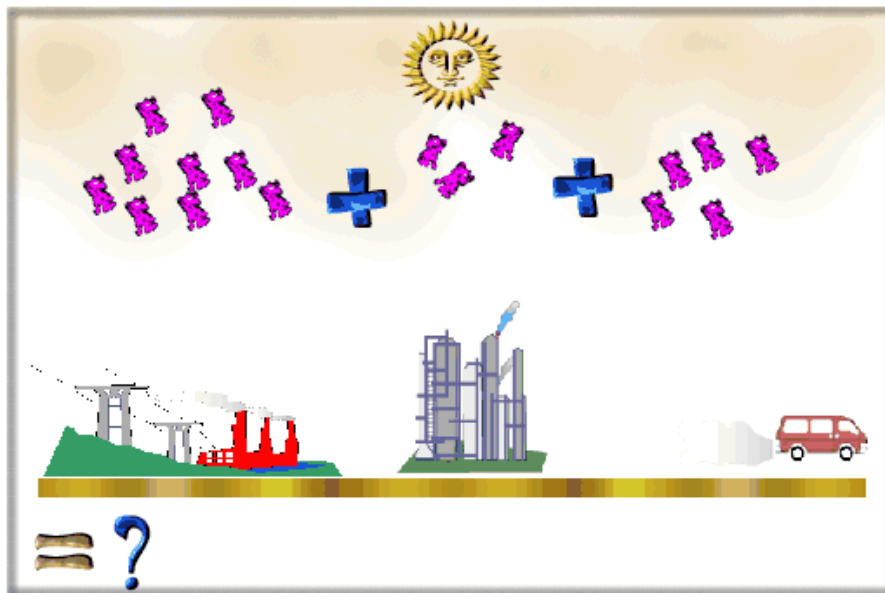


ELEVEN NASTY NITROGEN DIOXIDE AIR POLLUTION GREMLINS ARE COMING OUT OF CARS, ELECTRIC POWER PLANTS, AND OTHER LARGE INDUSTRIES. EIGHT MORE NASTY NITROGEN DIOXIDE GREMLINS HAVE CAUSED A SMELLY BROWN HAZE TO SHUT OUT THE SUNLIGHT. HOW MANY NASTY NITROGEN DIOXIDE AIR POLLUTION GREMLINS

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ODIOUS OZONE MATH PROBLEM

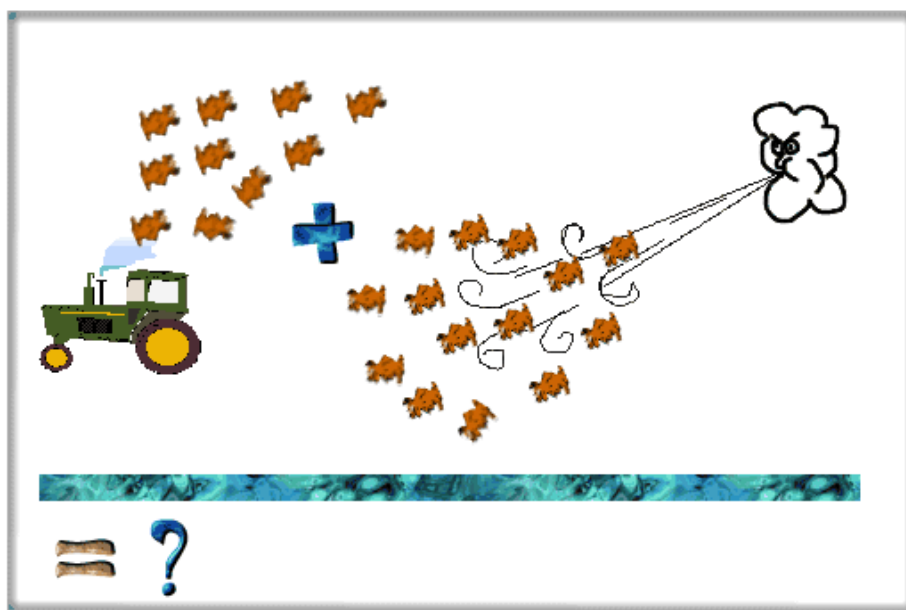


THERE ARE INVISIBLE ODIOUS OZONE AIR POLLUTION GREMLINS GETTING TOGETHER WITH OTHER POLLUTANTS AND FORMING SMOG. POLLUTION FROM THE POWER PLANT HELPED CREATE NINE ODIOUS OZONE GREMLINS. POLLUTION FROM THE INDUSTRIAL SMOKESTACK HELPED CREATE THREE ODIOUS OZONE GREMLINS. POLLUTION FROM AUTOMOBILE EXHAUSTS HELPED CREATE FIVE MORE ODIOUS OZONE GREMLINS. HOW

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PESKY PARTICULATE MATH PROBLEM

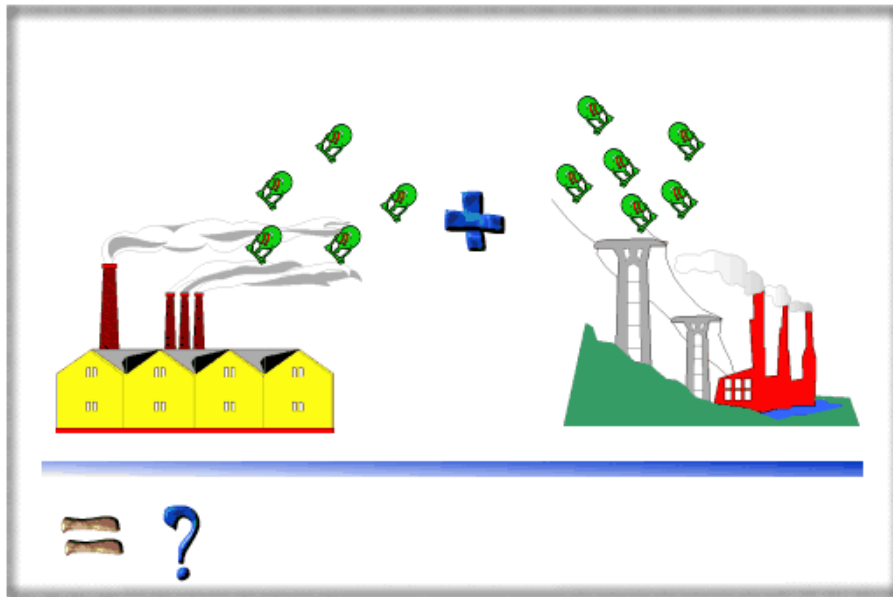


THERE ARE 14 VERY SMALL PESKY PARTICULATE AIR POLLUTION GREMLINS TRAVELING WITH THE WIND WITH MANY OTHER TINY PARTICLES. TEN MORE PESKY PARTICULATE AIR POLLUTION GREMLINS ARE BEING PRODUCED BY THE TRACTOR. HOW MANY PESKY PARTICULATE AIR POLLUTION GREMLINS ARE THERE ALL TOGETHER?

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SMELLY SULFUR DIOXIDE MATH PROBLEM

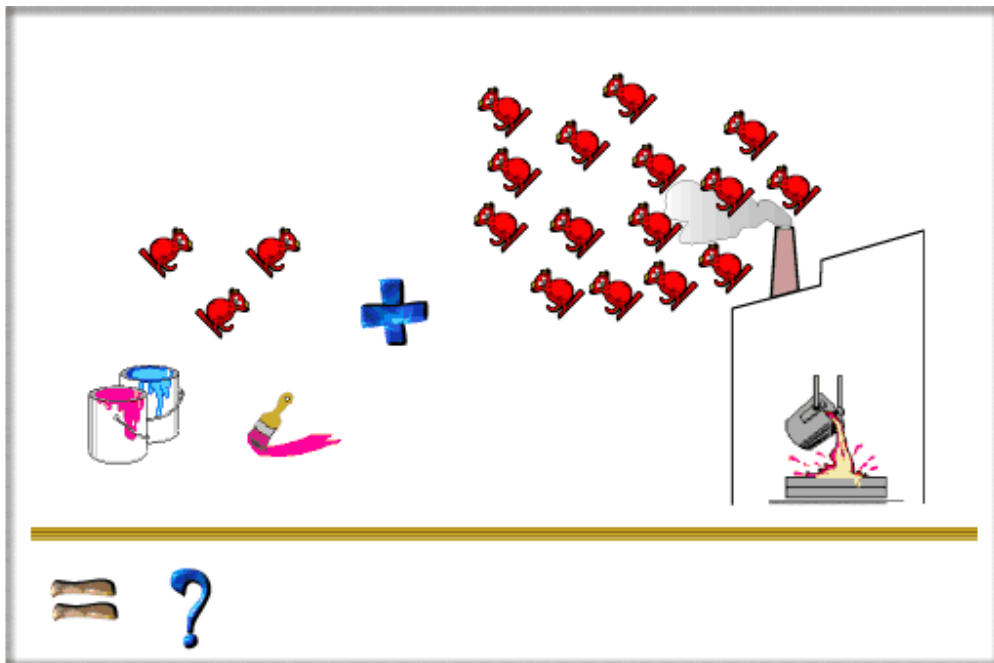


THERE ARE SIX SMELLY SULFUR DIOXIDE AIR POLLUTION GREMLINS COMING FROM POWER PLANT SMOKESTACKS AND FIVE MORE COMING FROM FACTORIES. HOW MANY SMELLY SULFUR DIOXIDE AIR POLLUTION GREMLINS ARE THERE ALL TOGETHER?

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LUMPY LEAD MATH PROBLEM



THERE ARE 15 LUMPY LEAD AIR POLLUTION GREMLINS COMING OUT OF A SMELTER AND THREE MORE COMING OUT OF SOME OLD PAINTS. HOW MANY LUMPY LEAD AIR POLLUTION GREMLINS ARE THERE ALL TOGETHER?