

# Activating Strategy

With a partner, identify environmental issues that impact people. If possible, identify the cause of each environmental issue.



# Essential Question: How have environmental issues affected Europe?

Standard: SS6G9a. Explain the major concerns of Europeans regarding the issues such as acid rain in Germany, air pollution in the United Kingdom, and the nuclear disaster in Chernobyl, Ukraine.



# Use your Environmental Issues Graphic Organizer to take notes

## Nuclear Disaster in Chernobyl, Ukraine

What happened?

Consequences:

## Acid Rain in Germany

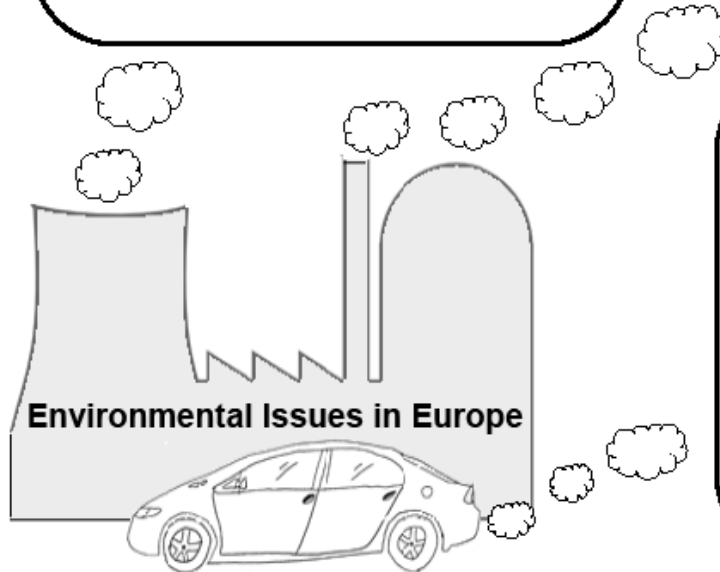
Causes:

Effects:

## Air Pollution in the United Kingdom

Causes:

Effects:



# Acid Rain in Germany



# \*What is Acid Rain?

- Acid rain is a result of air pollution. The burning of fossil fuels releases different chemicals into the air. These chemicals mix with water in the clouds.
- The rain from these clouds then falls as very weak acid.
  - It's not acidic enough to burn your skin, but it's very harmful for the environment.



# \*Acid Rain's Effect on the Environment

- Pollutes lakes, rivers, and streams
- Contaminates drinking water
- Harms trees, plants [vegetation] and aquatic life [such as fish]
- Damages buildings and statues made of brick and stonework over time



# Acid Rain's Effect on the Environment

Acid rain can effect plants in several different ways:

- It dissolves and washes away the nutrients and minerals in the soil which helps plants grow
- It causes the release of harmful substances such as aluminum into the soil
- It wears away the waxy protective coating of leaves











Sulfur dioxide and oxides of nitrogen in acid rain damage the shine and texture of stone monuments and carvings.





# Acid Rain in Germany

- Acid rain has destroyed nearly half of Germany's Black Forest!
- This has harmed Germany's economy because one of its major natural resources is timber.

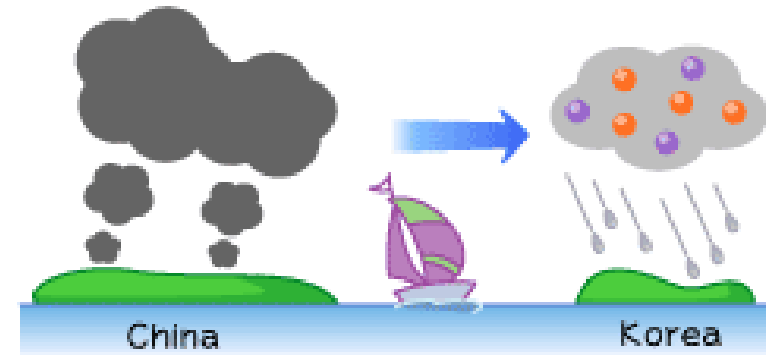
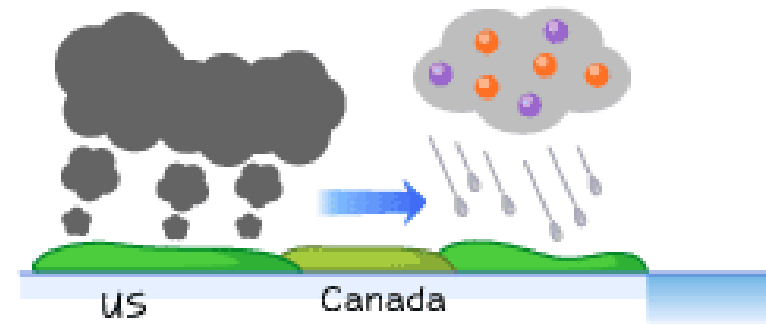
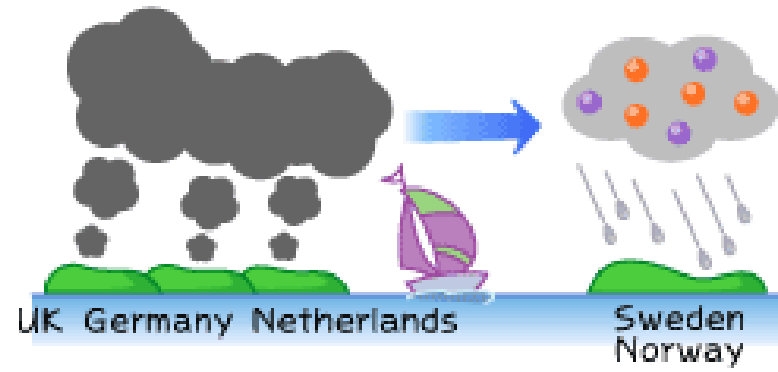


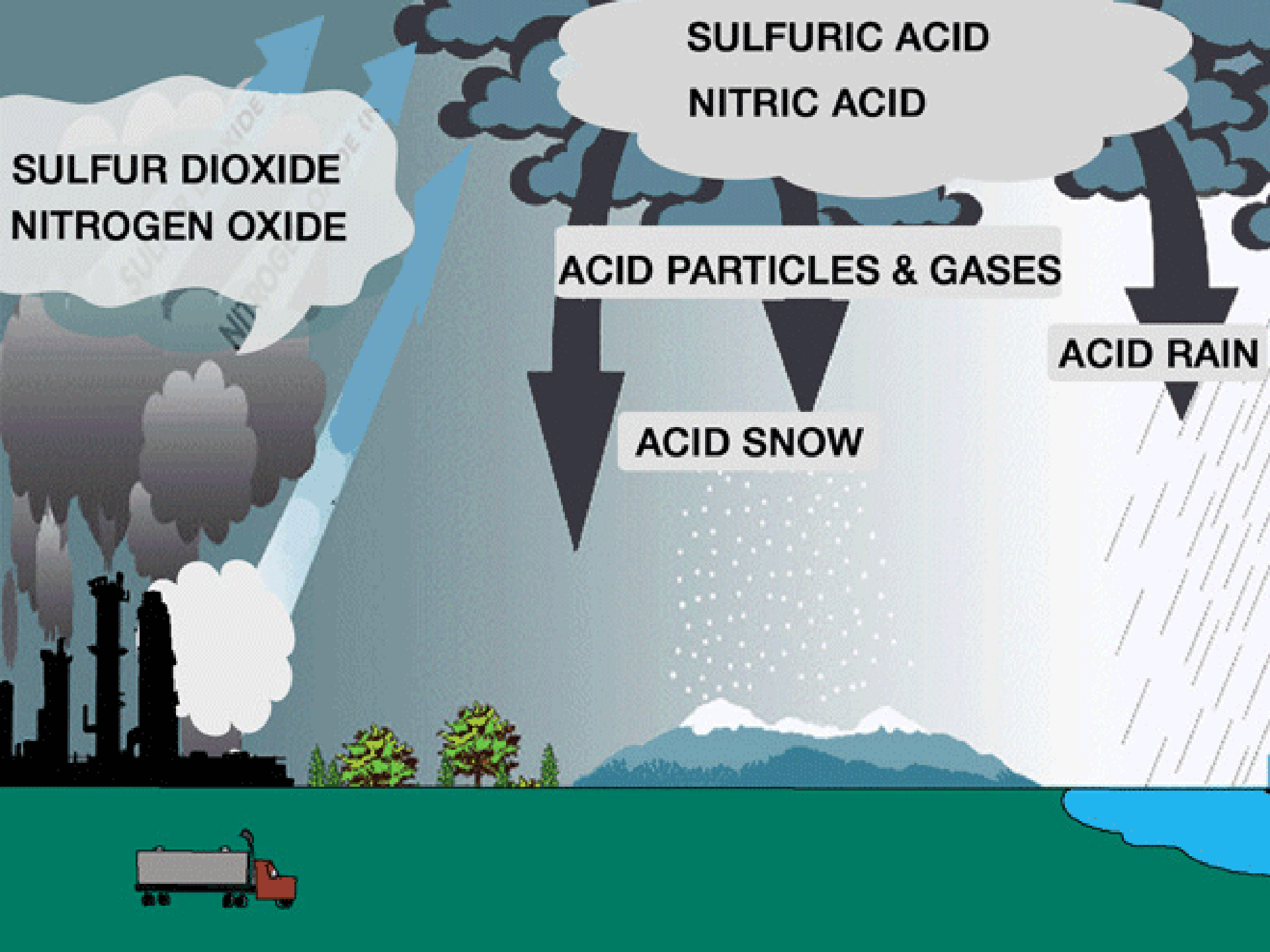


# \*Causes of Acid Rain in Germany

- Main source of acid rain is pollution from factories (burning fossil fuels like natural gas, coal, & oil)
  - Germany is a top manufacturing country. It leads the world in cars, steel, & chemical products
- Cars & buses also produce harmful gases
  - Germans own more cars than people of most other countries
- Sulfur deposits from Germany are carried through the air causing acid rain in other countries







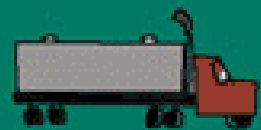
**SULFURIC ACID**  
**NITRIC ACID**

**SULFUR DIOXIDE**  
**NITROGEN OXIDE**

**ACID PARTICLES & GASES**

**ACID RAIN**

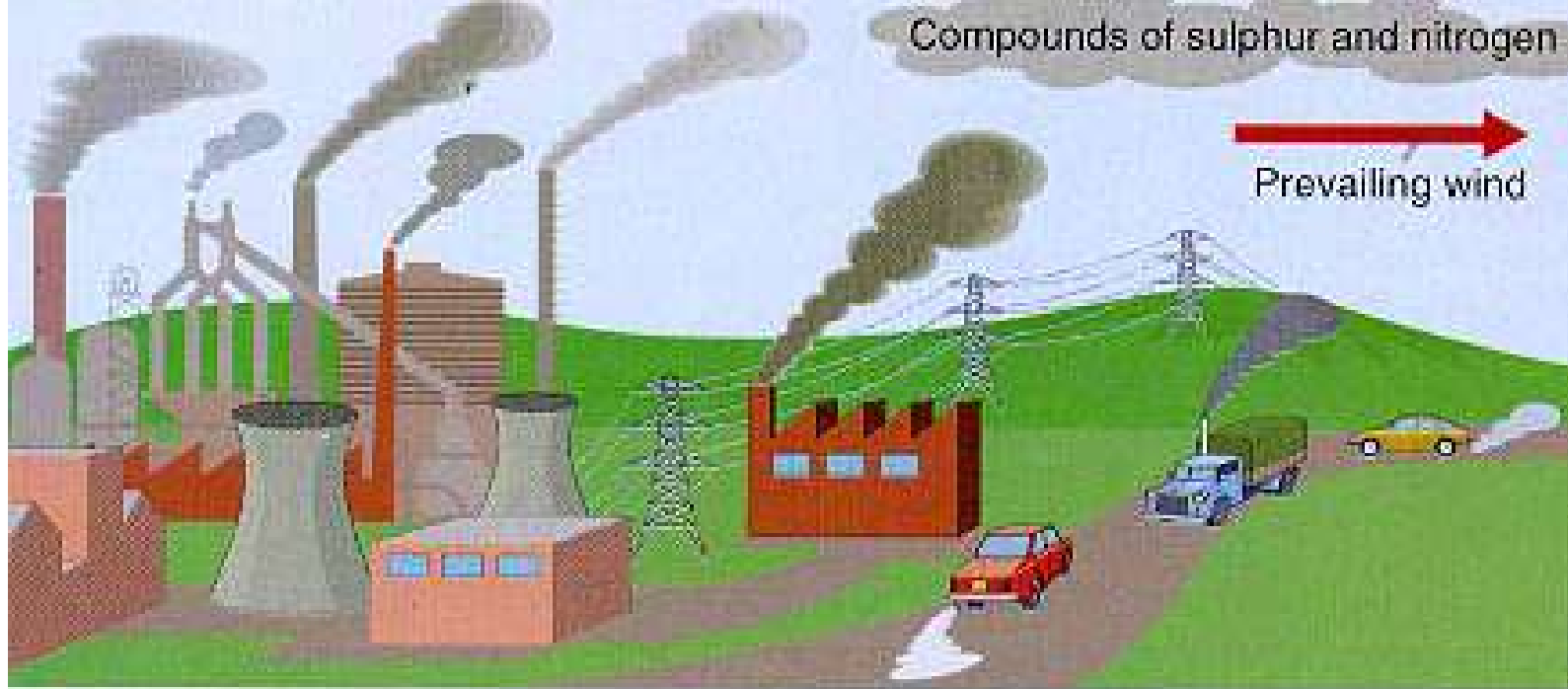
**ACID SNOW**





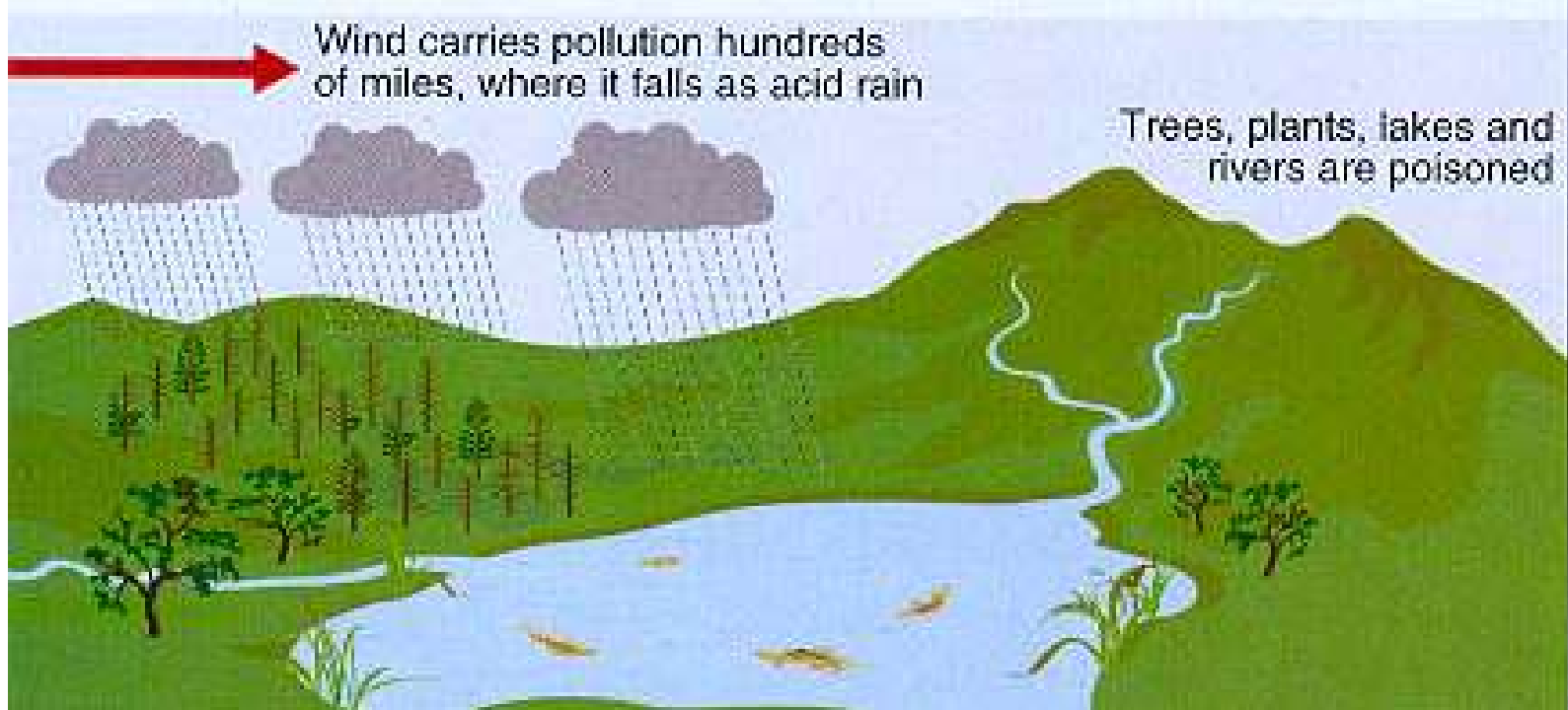
Compounds of sulphur and nitrogen

Prevaling wind



Wind carries pollution hundreds of miles, where it falls as acid rain

Trees, plants, lakes and rivers are poisoned



# \*Solving the Problem

- Plants that use water power are replacing many coal-burning factories
  - Developing new types of energy: leading producer of wind turbines & solar power
- German government has passed laws to reduce emissions from cars & factories
  - Factories are switching to cleaner fuels & building taller smokestacks that scrub the smoke before it enters the air
- Government is encouraging public transportation



# Acid Rain Animation

<http://www.youtube.com/watch?v=JRvvPOAWMAo>



# Air Pollution in the United Kingdom



# Air Pollution in the United Kingdom

- London, capital of UK, is famous for air pollution
  - Word “**smog**” first used in 1905 to describe air in London (thick fog + smoke)
- Thick London smog happens when water in the air mixes with smoke particles from a coal fire





# The Great Smog of 1952

- Smog was so dense that, for 4 days, people in London could not see what was in front of them
  - Transportation slowed, crime increased, & thousands of people died from the pollution
  - People around the world became frightened & worried about the quality of the air they were breathing







# \*Causes of Air Pollution

- The primary cause of air pollution in the United Kingdom is Power Stations (industry and power generation)
- Another major cause of air pollution is vehicle emissions

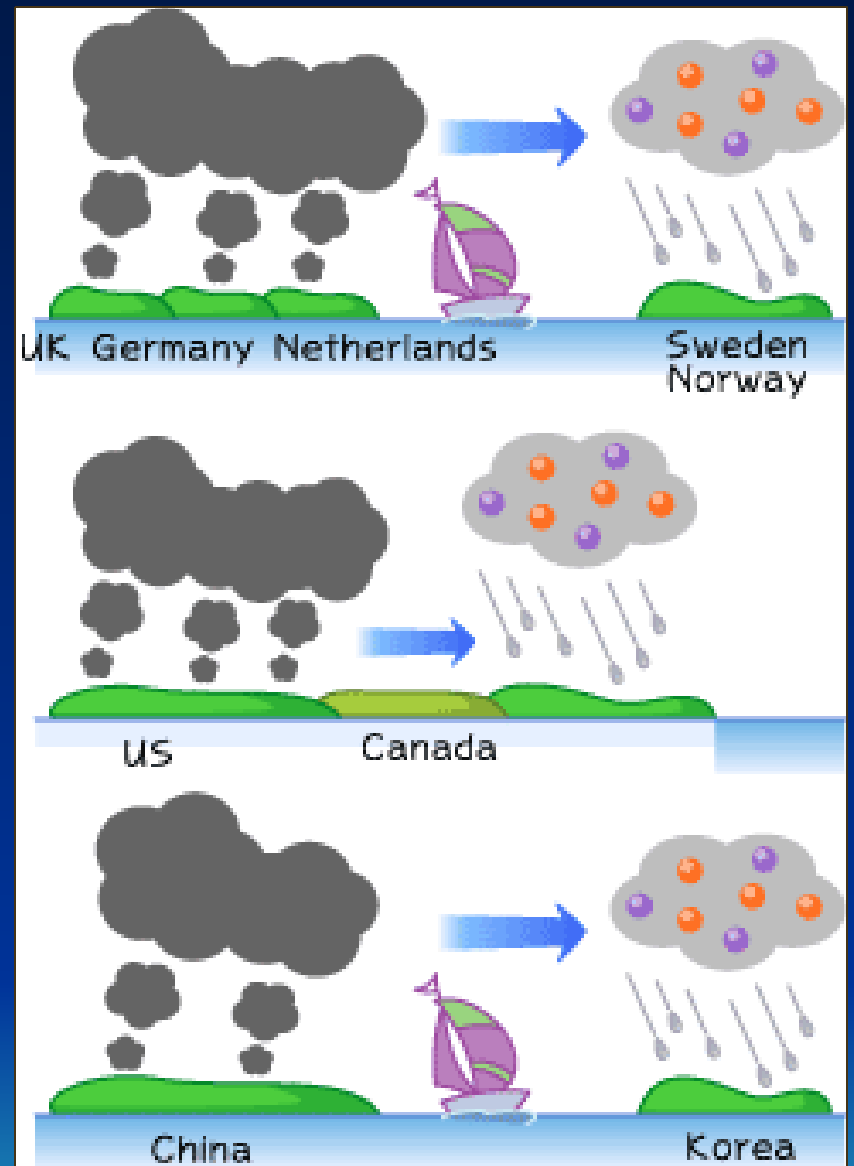


# \*Effects of Air Pollution

- Damages vegetation [plants]
- Harms the atmosphere
- Harms humans
  - increases the risk of respiratory infections, heart disease, stroke and lung cancer
  - Children, the elderly and poor people are more susceptible
- Causes acid rain which makes matters worse



The United Kingdom's air pollution causes problems for nearby countries because the air pollution is carried by wind.



# \*United Kingdom's Solution

- Government set up “smokeless zones” where only smokeless fuels could be used
  - Also sets limits for industry & regularly checks air quality
- Laws have forced automakers to build vehicles that produce less harmful exhaust
- Cleaner coals, increased use of electricity, and use of gas have reduced air pollution, but UK still ranks in the top 10 in the world for harmful industrial emissions





# Nuclear Disaster in Chernobyl, Ukraine

# Chernobyl Nuclear Disaster

The disaster began during a systems test on Saturday, 26 April 1986 at reactor number four of the Chernobyl plant, which is near the city of Pripyat.



# \*Chernobyl Nuclear Disaster

- There was a sudden power surge in a nuclear reactor that resulted in an explosion that sent a cloud of highly radioactive particles into the atmosphere and over a large geographical area.
- The cloud drifted over large parts of the western Soviet Union and Europe.







# Steps Taken to Limit Contamination

- At the nuclear power station itself, several attempts were made to clear away and contain chunks of graphite and other radioactive solids.
- They sent in volunteers.
- The volunteers were only allowed to be in the power station for 90 seconds or less.
- The radiation levels were 15,000 times greater than a normal person's exposure in a year.



# Steps Taken to Limit Contamination

- Any movable objects near the plant were buried; cars, trucks, and even topsoil.
- Some 60,000 buildings had to be washed with special chemicals, and even some roofs had to be replaced.
- A special solution was sprayed throughout the danger zone on streets and walkways to prevent radioactive dust from blowing and further contaminating the area.
- Nearby trees that had absorbed the radiation were all cut down and buried in concrete pits.



# \*Consequences of Chernobyl

- In the first months after the accident, 28 emergency workers died from radiation or thermal burns
- Since Chernobyl, there have been higher rates of cancer and birth defects in individuals living near Chernobyl
- Many animals died or suffered damage
  - Fish in nearby rivers were unsafe to eat for many years



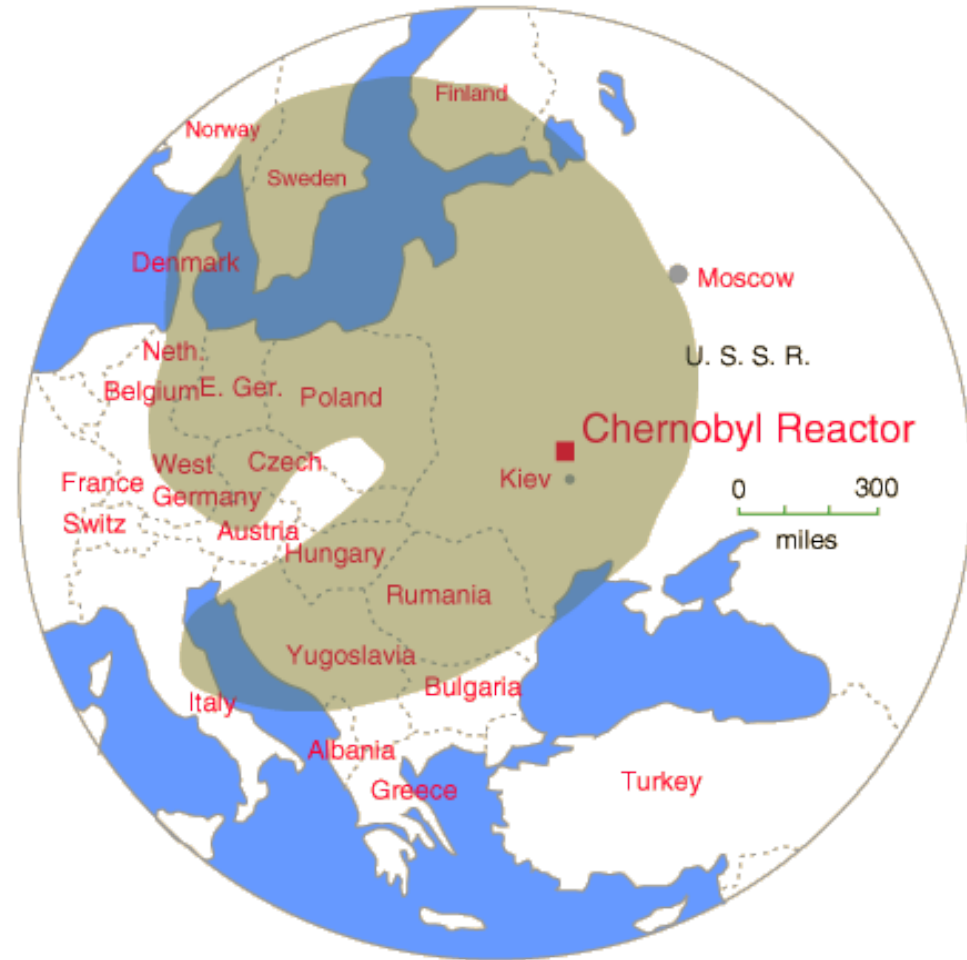
# \*Consequences of Chernobyl

- Millions of acres of farmland were poisoned causing food shortages and economic hardship
- From 1986 to 2000, 350,400 people were evacuated and resettled from the most severely contaminated areas of Belarus, Russia, and Ukraine.
- An official exclusion zone around the plant remains in place, extending for 18 miles. It is one of the most radioactive spots on Earth.

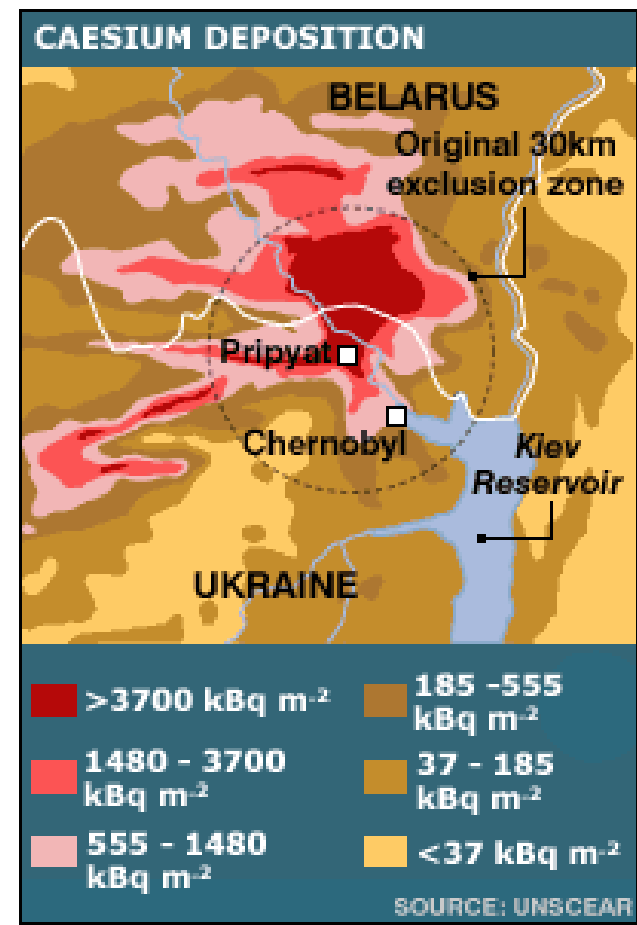
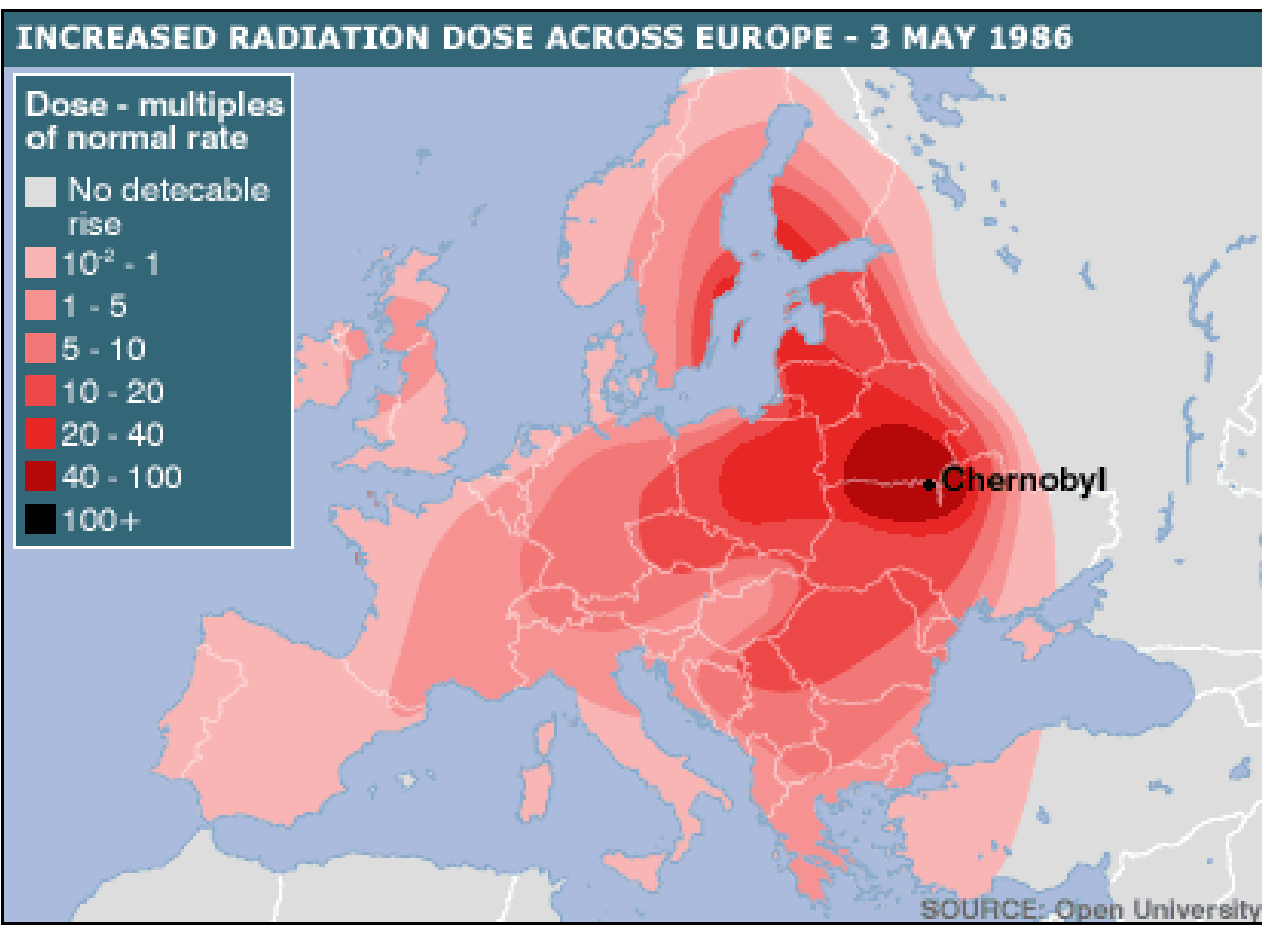


# The effect on other countries?

- Nearly nine tons of radioactive material - 90 times as much as the Hiroshima bomb - were hurled into the sky.
- Winds over the following days, mostly blowing north and west, carried fallout into Belarus, as well as Russia, Poland & other countries around the world.



# Consequences of Chernobyl



# Suggested Activities

[see resources]

- Chernobyl RAFT
- Select a product such as a bumper sticker, public service announcement, magazine or newspaper ad, brochure, editorial, jingle, song, cartoon, poster, etc. on either air pollution or acid rain. The product must include the name of the environmental issue and a statement about the issue or about solutions and/or ways to stop the issue.



# Summarizing Strategy

3 – 2 – 1

Identify 3 environmental issues facing Europe

Identify 2 ways to limit the impact of the environmental issues in Europe.

Identify 1 challenge to limiting the impact of environmental issues in Europe.

