### Let's Get It Started - Air Pollution

- 1. In 1988 employees inside Patagonia clothing companies Boston store began complaining of headaches inside the building. What do you think was causing the problem?
- 2. What are the major sources of airborne particulates in the Central Valley?
- 3. What is the geographic reason our valley air has such as high amount of particulate matter?

### Let's Get It Started - Air Pollution

 In 1988 employees inside Patagonia clothing companies Boston store began complaining of headaches inside the building. What do you think was causing the problem?

They were being poisoned by Formaldehyde and other chemicals had been used on the Cotton T-shirts to reduce wrinkling and shrinkage. The ventilation system in the building was broken and was endlessly recirculating the air. This is called sick building

#### Let's Get It Started – Air Pollution

- 2. What are the major sources of airborne pollutants in the Central Valley?
- cars, trucks, buses, agricultural equipment, dairies, industrical factories combust fossil fuels and release nitrogen oxides (NOx) and Particluate Matter (PM).
- Consumer products such as paint and even hair spray release Volatile Organic Compounds (VOC's)
- 11% of Fresno air pollution comes from San


### Let's Get It Started - Air Pollution

3. What is the geographic reason our valley air has such as high amount of PM, NOX, Smog, Ozone, etc?

 Our Air Basin is basically a bowl with mountains on both sides. The air has no outlet.



### Let's Get It Started (LGIS) #2 – Air Pollution

- Identify two sources of each particulate matter, formaldehyde, asbestos, volatile organic compounds.
- 2. Describe why Ozone is a secondary pollutant and not a primary pollutant.
- 3. Diagram a temperature inversion.
- 4. Describe why wearing a jacket keeps you warm.
- 5. Have you signed up for the AP test?

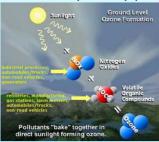
### Let's Get It Started (LGIS) #2 – Air Pollution

 Identify two sources of each – particulate matter, formaldehyde, asbestos, volatile organic compounds.

PM Examples:	Formaldehyde	Asbestos	voc
Dust, Diesel Smoke, Smoke,	Sources: Wood Paneling Furniture (glue)	Uses: Fireproofing Insulation	Sources: Paint fumes, glue, gasoline, air
Pollen, Smog Sources: Cars, Industry, Agriculture, Flowers	Anti Wrinkling Agent Clothes	Sources: Popcorn Ceilings, Insulation	freshener, dry cleaning chemicals, household cleaners.

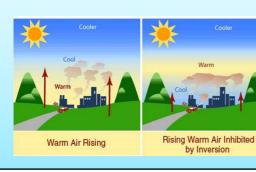
### Let's Get It Started (LGIS) #2 – Air Pollution

2. Describe why Ozone is a secondary pollutant and not a primary pollutant.



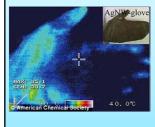
# Let's Get It Started (LGIS) #2 - Air Pollution

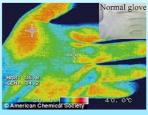
3. Diagram a temperature inversion.



# Let's Get It Started (LGIS) #2 – Air Pollution

4. Describe why wearing a jacket keeps you warm.





### Let's Get It Started (LGIS) #2 – Air Pollution

5. Have you signed up for the AP test?

You Have Until Next Friday the 6<sup>th</sup>. After Next Friday there will be a \$15.00 penalty.

#### Let's Get It Started (LGIS) #3 - Air Pollution

- Last classes' activity focused on CO<sub>2</sub>. Redesign the activity to include CH<sub>4</sub>, N<sub>2</sub>O, and CFCl<sub>2</sub>.
- Describe similarities and differences between the greenhouse effect and wearing a jacket in the winter.

### Let's Get It Started (LGIS) #3 – Air Pollution

 Last classes activity focused on CO<sub>2</sub>. Redesign the activity to include CH<sub>4</sub>, N<sub>2</sub>O, and CFCl<sub>2</sub>.

CH<sub>4</sub> – Catch 2 students

 $N_20 - 5$  students

CFCl<sub>2</sub> – Everybody

Let's Get	It Started	(I GIS)	) #3 - Aiı	Pollution
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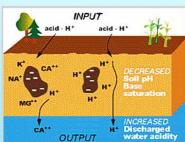
2. Describe similarities and differences between the greenhouse effect and wearing a jacket in the winter.

Let's Get It Started	(LGIS	) #4 - Air	<b>Pollution</b>
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- 1. Explain how acid rain causes the soil to leach nutrients.
- 2. Balance these rxns for Nitric Acid and Sulfuric Acid
- $N_2$  +  $O_2$   $\rightarrow$  NO
- NO +  $O_2 \rightarrow NO_2$  (Brown Air Smog)
- $NO_2 + H_2O \rightarrow HNO_3 + NO$
- $SO_2 + O_2 \rightarrow SO_3$
- $SO_3 + H_2O \rightarrow H_2SO_4$

# Let's Get It Started (LGIS) #4 – Air Pollution

1. Explain how acid rain causes the soil to leach nutrients.



### Let's Get It Started (LGIS) #4 – Air Pollution

2. Balance these rxns for Nitric Acid and Sulfuric Acid

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• N_2 + O_2 \rightarrow 2 NO
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• 
$$3 \text{ NO}_2 + \text{H}_2\text{O} \rightarrow 2 \text{ HNO}_3 + \text{NO}$$

• 
$$2 SO_2 + O_2 \rightarrow 2 SO_3$$

• 
$$SO_3$$
 +  $H_2O$   $\rightarrow$   $H_2SO_4$ 

### Let's Get It Started (LGIS) #5 - Air Pollution

- 1. In the stratosphere describe why ozone is beneficial and show the chemistry of both ways Ozone is broken down.
- 2. Did you sign up for the AP test yet? Friday!
- 3. Graph This Information be sure to accurately label your axis.

Levels	of Methane
1. <u>Year:</u>	ppm
2. 1890	14
3. 1900	18
4. 1915	27
5. 1920	14
6. 1930	20
7. 1950	23

### Let's Get It Started (LGIS) #5 – Air Pollution

1. In the stratosphere describe why ozone is beneficial and show the chemistry of both ways Ozone is broken down.