Clear Skies Ahead: Clearing up the Confusion on Clouds

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Overview

- Learning Cycle Lesson about Clouds
  - Engage: Make a cloud and place it on our sky map.
  - Explore: Sort our cloud photos.
    - How are clouds similar?
  - Explain: Learn more about cloud characteristics.
  - Extend: Create a cloud dichotomous key.
  - Evaluate: Re-examine our understanding.

My cloud

- With your materials, make a cloud!

- While your glue is drying, work with your table or row partners and answer these questions:

  - How are clouds similar?
  - How are clouds different?

Hang your cloud!

- Place your cloud on our sky maps around the room.

- Where does your cloud reside in the sky?

Lots of CLOUDS!

- Explorable Question: How are clouds similar or different?
- With your pack of cloud photos, explore the similarities and differences between clouds.
  - Consult your list that you made already.
- Do you need to add characteristics to that list?

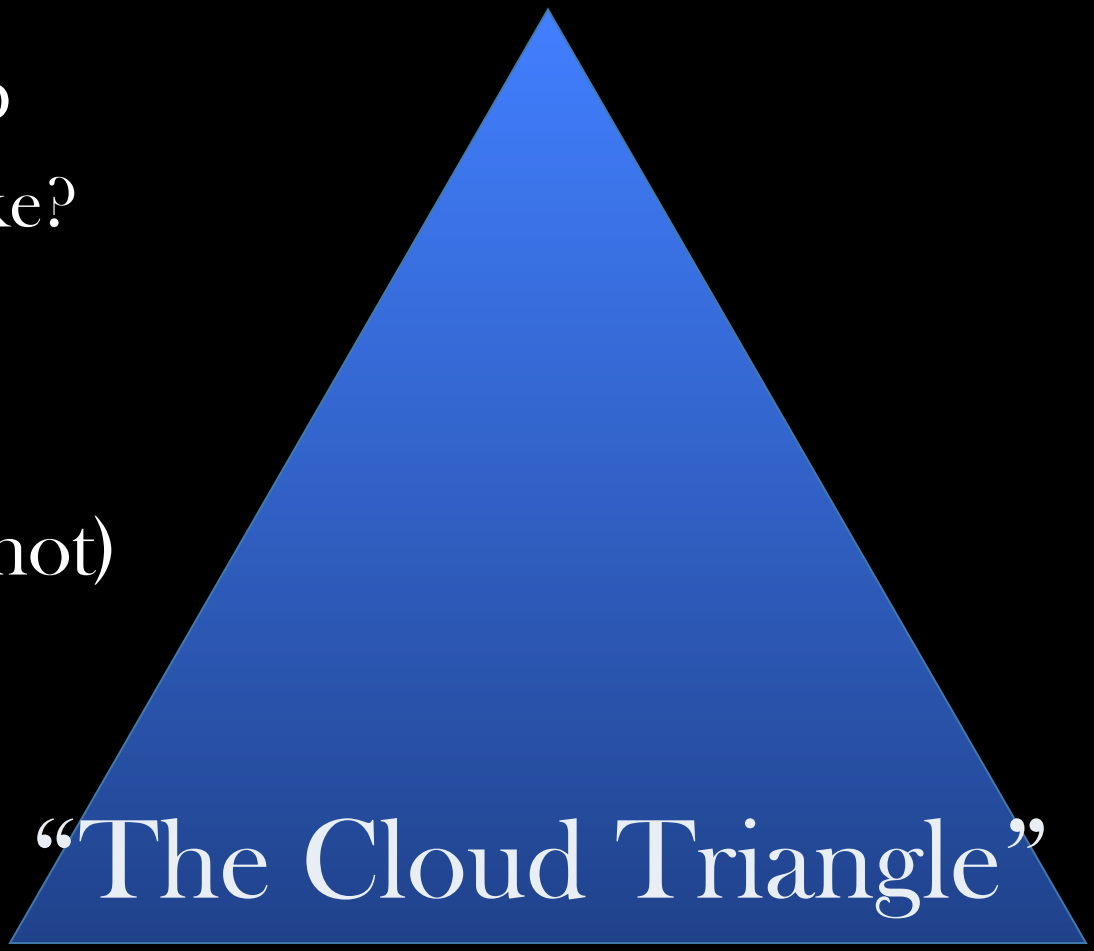
How are clouds similar and different?

- Let's compile your list. Call out your characteristics:
  - Fluffy
  - Wispy
  - Layers
  - Poofy
  - Blankety
  - Dark

Feathery
High
Puffy
Dense
Towering
Anvil
Flat
Smoky

Common Cloud Characteristics

- Physical Make-up
  - What's it look like?
- Elevation
  - How high is it?
- Precipitation (or not)
  - Is it raining?



Physical Characteristics

Wispy (cirrus)

Flat layer (stratus)

Puffy (cumulus)

Base Elevation

High Clouds (cirro- or cirrus)
Base above 6km

Middle Clouds (alto-)
base between 2-6km

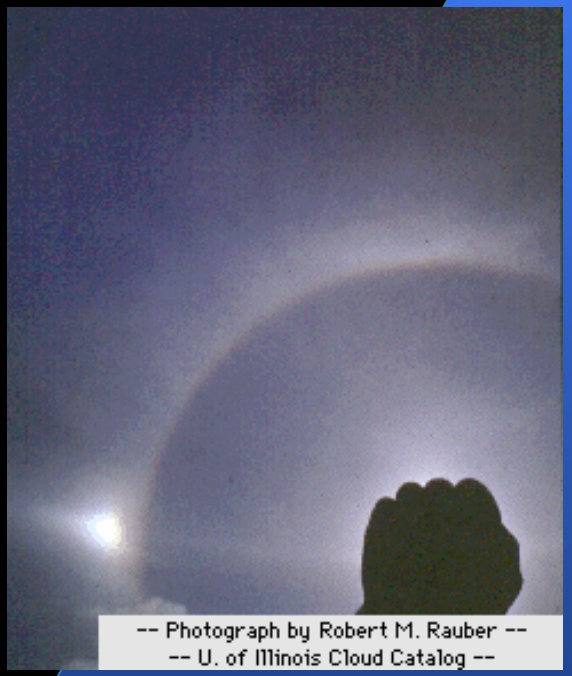
Low Clouds (cumulus or stratus)
base below 2km

High Clouds

Cirrus

Cirrostratus

Cirrocumulus



Cloud base above 6km (20,000ft)

Middle Clouds

Altostratus

Altocumulus

Cloud base between 2km - 6km (6,500 - 20,000ft)

Low Base Clouds

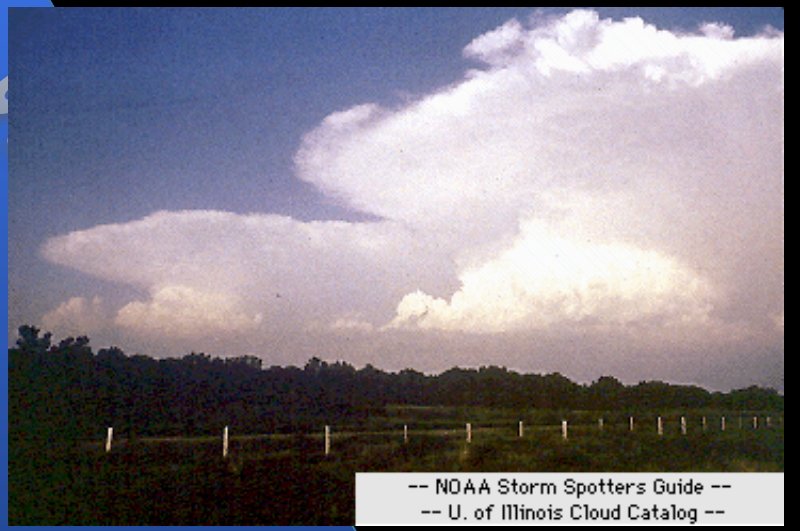
Stratus

Stratocumulus

Cumulus

Cloud base below 2km (6,500ft)

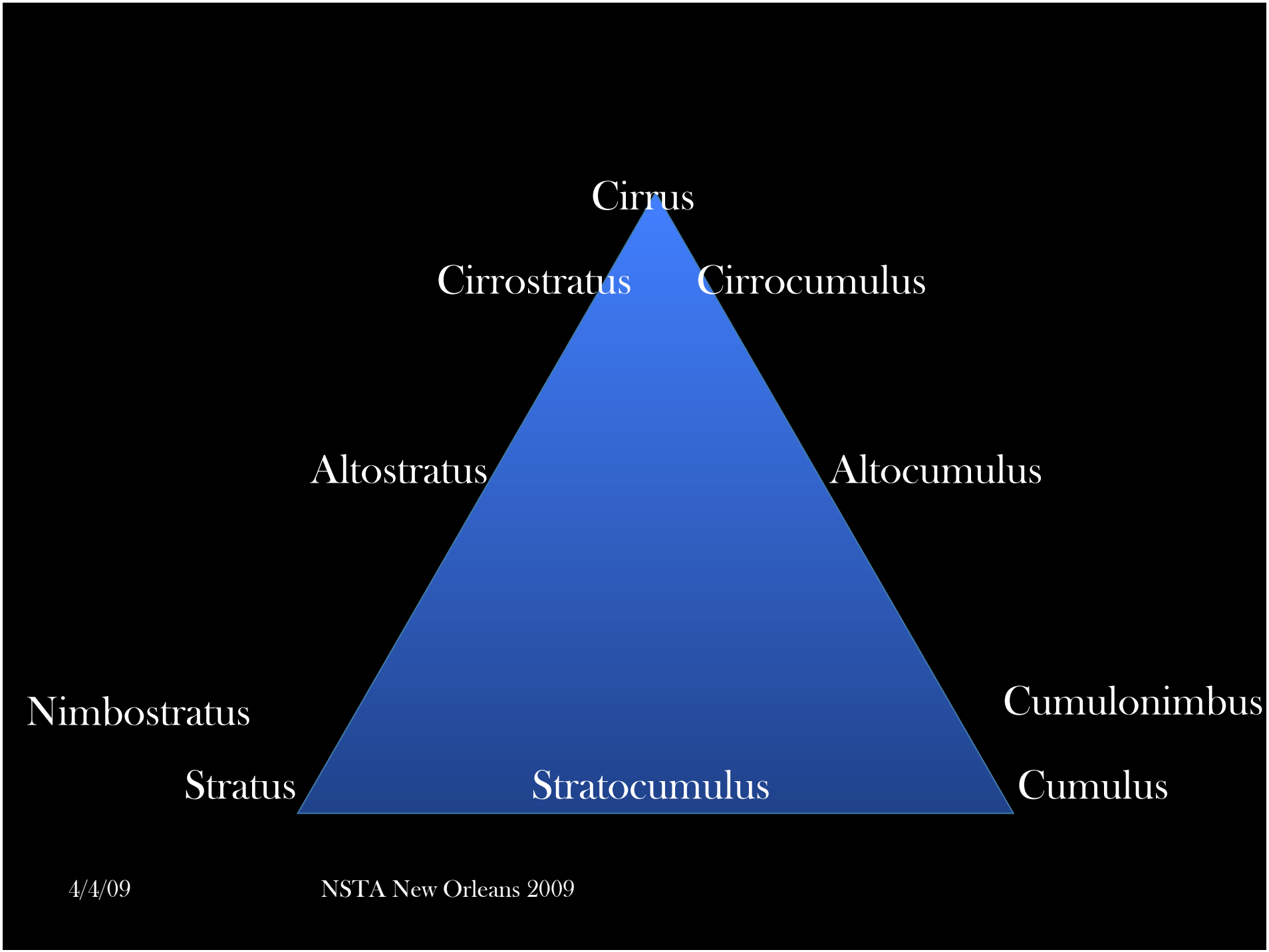
Precipitating Clouds



Nimbostratus

Cumulonimbus

Cloud base below 2km (6,500ft)


Cirrus
Cirrostratus
Cirrocumulus
Altostratus
Altocumulus
Nimbostratus
Cumulonimbus
Stratus
Stratocumulus
Cumulus

Oh, boy.. SO many to remember..

- I'm overwhelmed!!
  - TOO many
  - What's the point... ??
- Cloud types are **NO WHERE** in my state standards/objectives

So who cares?

- BUT!! National Standards do say:
  - Grades K-4: Students must increase their understanding of the characteristics of objects and materials that they encounter daily
  - By grade 4, distinctions between the properties of objects and materials can be understood in specific contexts, such as a set of rocks or living materials.
- How do scientists organize, group, and sort items?

Let's Try it

- Create a "Cloud Dichotomous Key"
  - Work with your table partners
  - Use your list of common cloud characteristics
  - Use your cloud photos

4/4/09

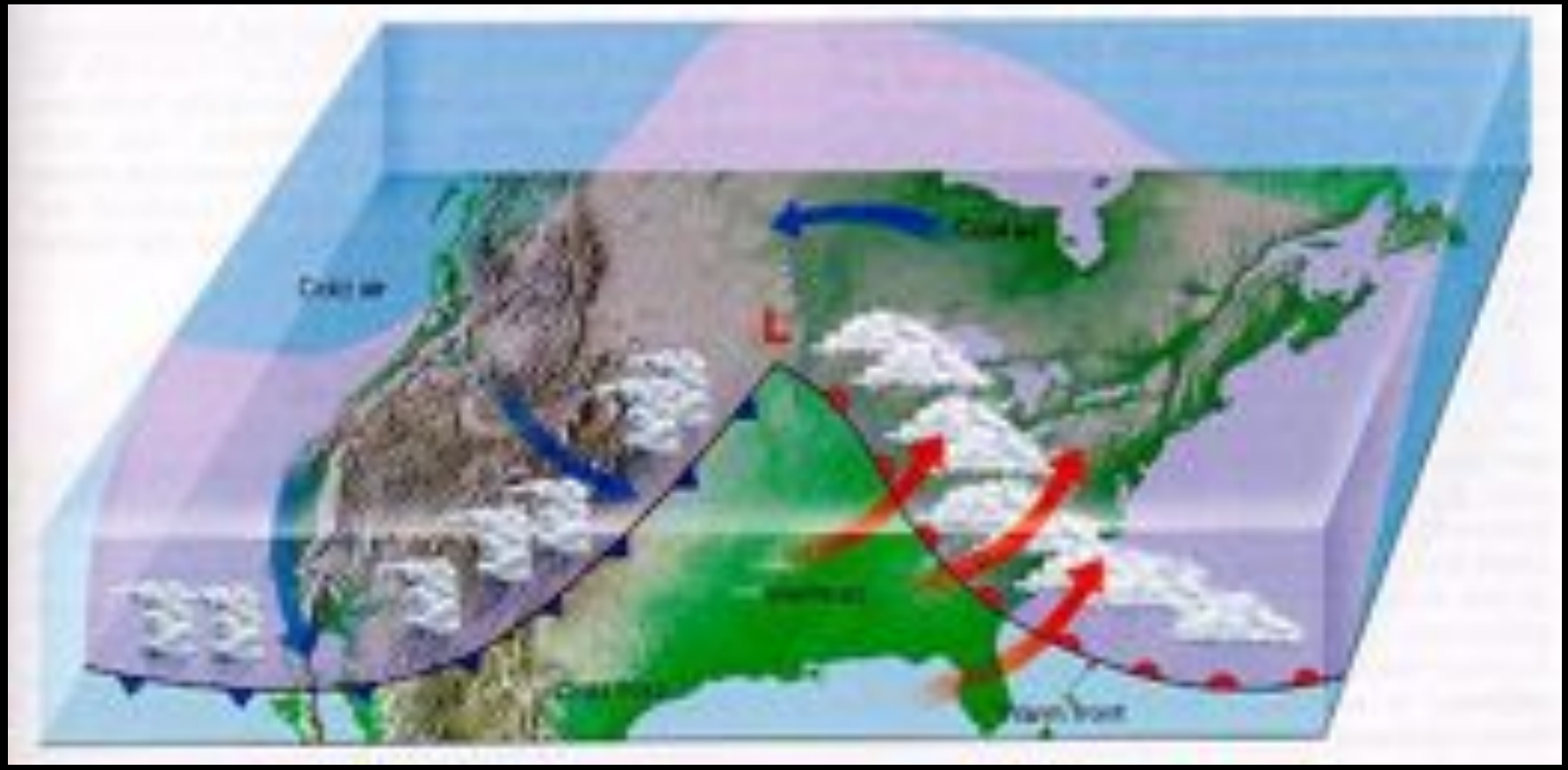
Great job!

- Why do we care?
  - What's in your state standards/objectives?
- Do scientists care?
  - My first interest…
  - First female PhD meteorologist, Joanne Simpson
  - MANY space satellite CLOUD missions
    - TRMM (Tropical Rainfall Measurement Mission)
    - NASA and CSA collaboration Cloudsat platform

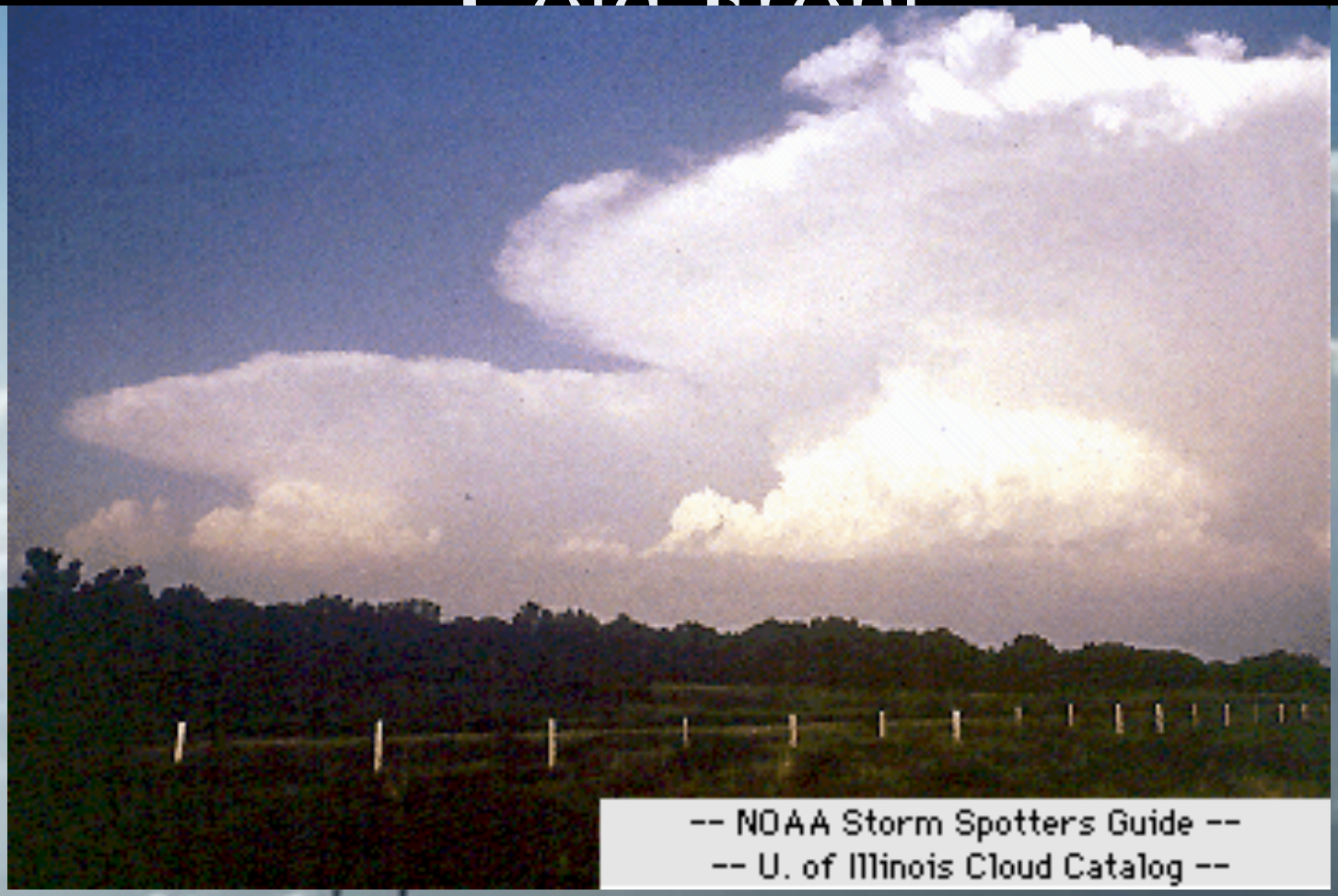
Our state standards (WV)

- Grades K - 1: record changes in weather
- Grades 3 - 4: make predictions and inferences based on patterns of evidence
- Grade 9: predict future weather
  - Are cloud patterns related to fronts?
  - Can clouds be used to predict the weather?

Low Pressure Center



Cold Front



-- NOAA Storm Spotters Guide --
-- U. of Illinois Cloud Catalog --

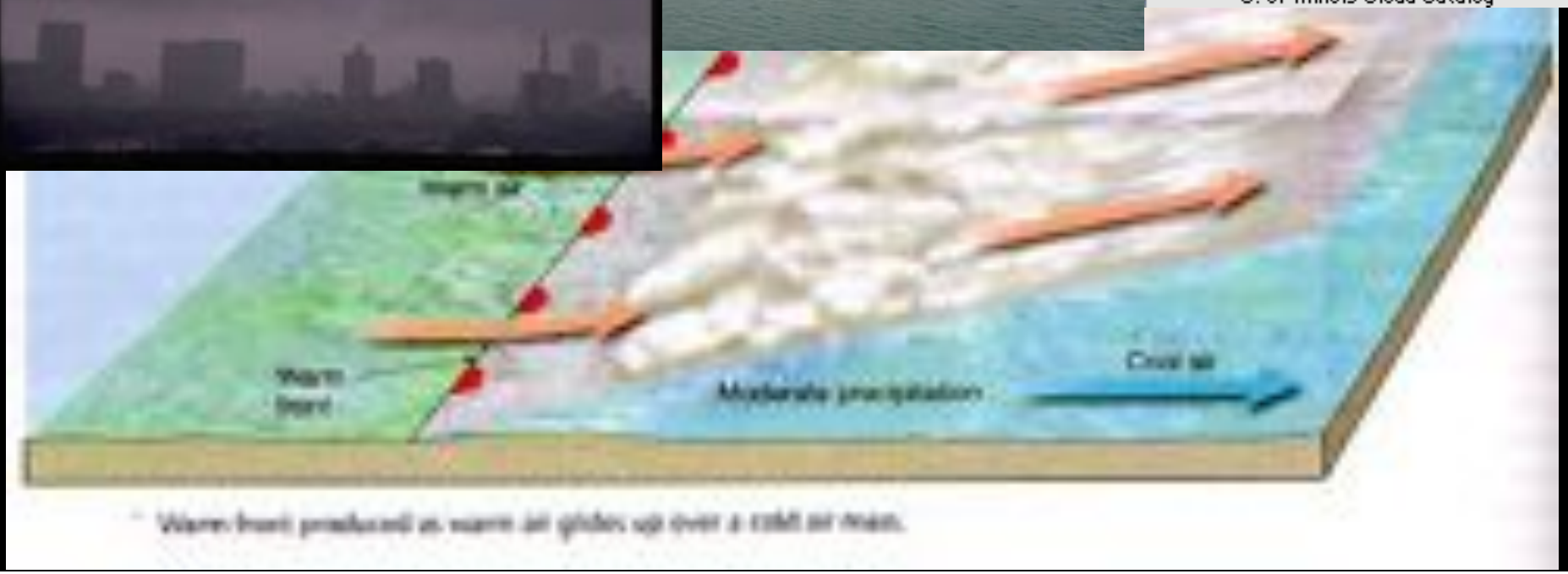
* Fast-moving cold front and cumulonimbus clouds. Thunderstorms often occur if the warm air is unstable.

Weather along a Cold Front

Weather Phenomenon	Prior to the Passing of the Front	Contact with the Front	After the Passing of the Front
Precipitation			
Clouds			

Warm Front

-- Photograph by Robert M. Rauber --
-- U. of Illinois Cloud Catalog --



Warm front produced as warm air glides up over a cold air mass.

Weather Along a Warm Front

Weather Phenomenon	Prior to the Passing of the Front	Contact with the Front	After the Passing of the Front
Precipitation			
Clouds			

Un-Frontal Weather

- Afternoon Thunderstorms

-- U. of Illinois Cloud Catalog --

4/4/

Any questions?

- Session materials will be available at this website:
  - http://wvscience.org
- My email address (and name)
  - Tina.cartwright@marshall.edu (yes, like the movie!)

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