Answer on the back or on separate sheets in complete sentences.

The first lab assignment is designed to get you thinking about the impact of a meteorological phenomenon, in this case a tornadic thunderstorm. In a way, it is meant to stimulate thought on your part about what you would need to know in order to say something about the meteorology of such a storm. I realize you may know nothing about thunderstorms and have not thought about this before.

Below is a section of the syllabus in which I gave a very incomplete list of the various topics we might cover this semester.

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**Topics Covered.**

1. Introduction
2. Guidelines for good physical problem solving; working with dimensions and units
3. Composition and Structure of the Atmosphere
4. Radiative Energy
   a. Laws of Radiation
   b. Principle of Conservation of Energy
5. Atmospheric Moisture
6. Measures of Humidity
7. Clouds
8. Precipitation Formation
9. Atmospheric Instability
    a. Ideal Gas Law
    b. Conservation of Energy/First Law of Thermodynamics Review
    c. Hypsometric Relation
    d. Equation of Motion Review
    e. Conservation of Mass Applied to the Atmosphere
11. Development of motion and weather patterns/systems
    a. Scales of circulation overview
    b. Mass conservation scaled for the synoptic-scale atmosphere and its implications
    c. Models of the General Circulation of the atmosphere and their limitation as conceptual models
    d. Synoptic scale systems in the middle latitudes and tropics: wave cyclones and hurricanes
12. Operational Applications and Techniques
    a. Use of sounding analysis in support of thunderstorm forecasting
    b. Synoptic-scale weather systems in three dimension (wave cyclones)
    c. Synoptic-scale weather chart analysis and forecasting
    d. Thunderstorm types, including supercell thunderstorms
    e. Severe weather analysis and forecasting
    f. Ensemble forecasting
1. Think about the Joplin tornadic thunderstorm. List five of the topics listed above that you believe you would need to directly master (or know plenty about) in order to understand the Joplin storm. These might be very obvious. For each topic, state briefly why you feel you would need to know this. (50 points)

Instability, Thunderstorms, Severe weather Analysis, Thunderstorm Forecasting

2. Now, list five other areas in the topic list above that you think MIGHT relate to your understanding of the meteorology of the Joplin thunderstorm. For each topic, state briefly why you feel it might relate to an understanding of that thunderstorm. (50 points)

Atmospheric Moisture, Clouds, Radiative Energy, Conservation of Energy/Thermodynamics, Precipitation Formation