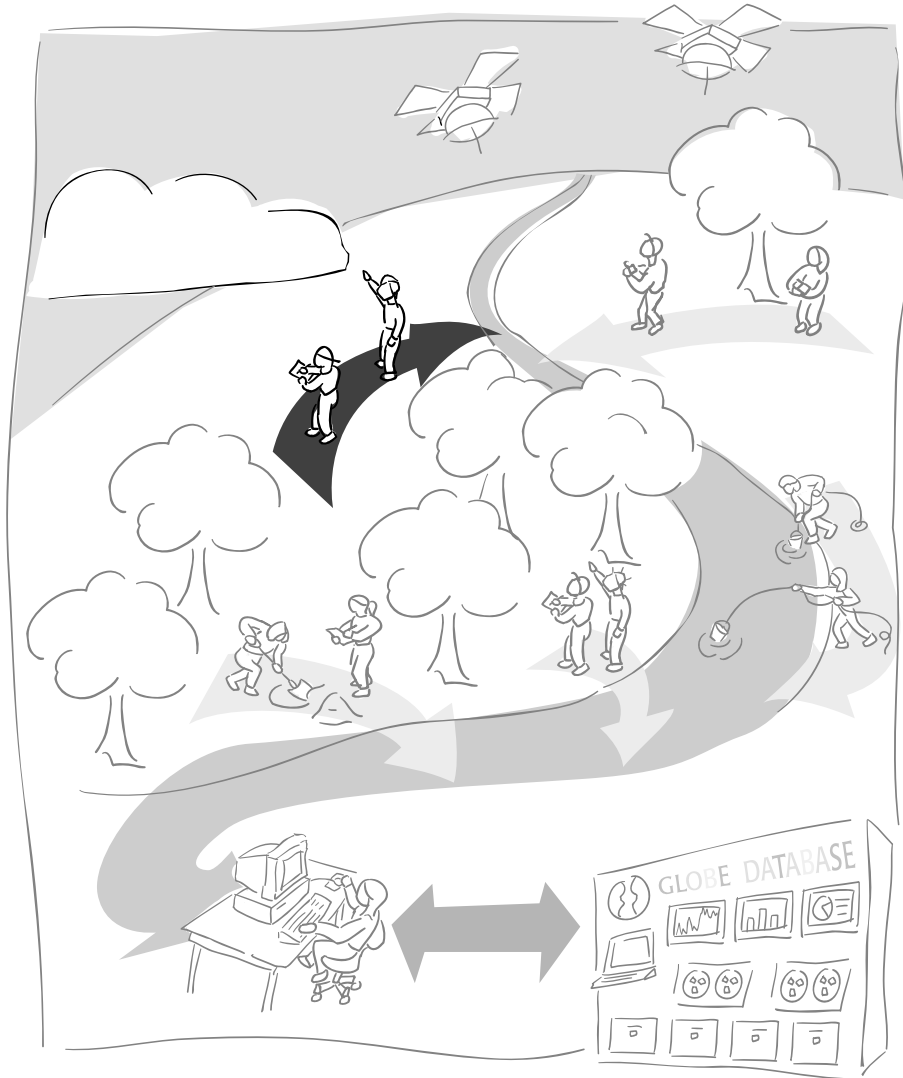


# Atmosphere Investigation



**A GLOBE® Learning Investigation**



# Atmosphere Investigation at a Glance



## Protocols

Daily measurements within one hour of local solar noon:

cloud cover and type  
precipitation (rain or snow) and snow pack including precipitation pH  
maximum and minimum temperature for the last 24 hours  
current temperature

At least one measurement per day:

aerosol  
barometric pressure  
relative humidity  
ozone

## Suggested Sequence of Activities

- Read the *Introduction*, especially the sections *What Measurements Are Taken* and *Getting Started*.
- Read the brief description of the learning activities at the beginning of the *Learning Activities* section.
- Review the protocols and plan which measurements your students will take; feel free to start with an easily sustained level of effort and then expand.
- Order any new or replacement instruments required.
- Cloud measurements are the easiest place to start and are required for several other protocols; do these activities with your students before beginning cloud observations:
  - Observing, Describing, and Identifying Clouds*
  - Estimating Cloud Cover: A Simulation*
- Install the instrument shelter which is required for taking air temperature measurements.
- Check the calibrations of your instruments (thermometers and barometer or altimeter).
- Have students define their Atmosphere Study Site and submit site definition data to GLOBE.
- Install your rain gauge and barometer or altimeter and plan out measurement logistics (such as where will required instruments and materials stay, timing and time requirements, etc.).
- Choose which *Atmosphere Data Sheets* your students will use and copy them.
- Copy the *Field Guides* for the protocols your students will follow.
- Teach students how to take the measurements following the *Field Guides*, record their readings on the *Data Sheet(s)*, and report data to GLOBE.
- Transfer to the students as much responsibility as practical for taking measurements and reporting data.
- Have students look at their data and comparable data from other schools.
- Engage students in inquiry and help middle and secondary students conduct student research projects using the *Looking at the Data* sections of the protocols.



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## **Protocols**

Instrument Construction, Site Selection, and Set-Up
Cloud Protocols
Aerosol Protocol
Optional Barometric Pressure
Relative Humidity Protocol
Precipitation Protocols
Maximum, Minimum, and Current Air Temperature Protocol
Ozone Protocol



## **Learning Activities**

<i>Learning Activities Supporting Taking and Understanding Measurements</i>
Observing, Describing, and Identifying Clouds
Estimating Cloud Cover
Observing Visibility and Sky Color
Making a Sundial
Calculating Relative Air Mass
Studying the Instrument Shelter
Building a Thermometer
Cloud Watch
Constructing a Model of Parts Per Billion of Surface Ozone
<i>Learning Activities Supporting the Use of Visualizations to Look at Data</i>
Making a Contour Map
Draw Your Own Visualization
Learning to Use Visualizations: An Example with Elevation and Temperature



## **Appendix**

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