



# Shape Shifters in the Sky

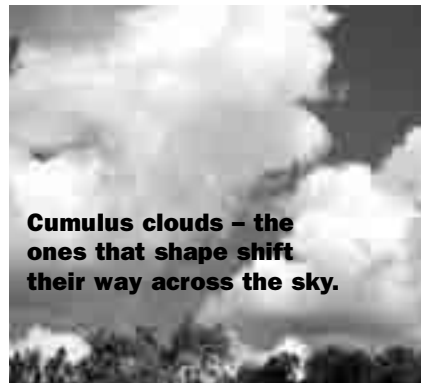
by Jim Cornish

Lying on a backyard lawn watching the clouds shape-shift their way across a summer sky is a childhood right of passage. But no matter how many elephants or faces we see, little thought is given to what clouds are, their names and how they form and why they don't just suddenly fall right out of the sky.

Our fascination with clouds is not limited to our youth or modern times. Clouds have always amazed us. They are part of the myths and legends of cultures throughout the world. Often linked to the supernatural, these stories record some very unscientific explanations of what we once thought clouds were. To the Norse, for example, clouds were the Valkyrie — the daughters of their powerful god Odin — riding white steeds to some battlefield to collect the souls of dead warriors for Odin's army in Valhalla. In North American native legends, clouds are people living above the earth and going about their daily lives.

## Clouds Explained

Thanks to science, we now know that clouds are made of water droplets or ice crystals condensed by the lowering of air temperature and/or air pressure. We know that clouds are limited to the troposphere — the 16 km thick atmospheric layer closest to the earth. We know that clouds form when unstable air rises, when warmer moist air comes in contact with a cold surface (fog) or when air is forced to rise over obstacles like mountains. We also know how they form. When



**Cumulus clouds – the ones that shape shift their way across the sky.**

air temperature reaches a certain point, the normally invisible vapour condenses onto microscopic particles, usually dust or salt, to form droplets. As the drops grow in number and size, clouds become visible. When the droplets get sufficiently large and heavy, they begin to fall through the rising air. When they reach the ground, we call it rain, or if frozen in flakes, snow.

## Activities

1. Spend some time spotting and naming clouds. Use the web sites listed in Clouds Online (<http://www.cdli.ca/CITE/scouts/index.htm>) to view "textbook" examples of



**Hooked cirrus clouds sometimes indicates fast upper winds such as the jet stream.**

the various cloud types. Download this printable *Cloud Key* for cloud names and commonly associated weather.

<http://teacher.scholastic.com/lessonrepro/reproducibles/profbooks/cloudkey.pdf>

2. Watch the clouds for unusual shapes. Photograph them and put them on display. Checkout some wacky cloud shapes at *Cool Clouds for Kids of All Ages* [http://www.pals.iastate.edu/carlson/look\\_like/index.html](http://www.pals.iastate.edu/carlson/look_like/index.html).
3. Complete a cloud survey for a week. Include date, times, wind direction, cloud types and associated

Photographer: Jim Cornish, Gardner, 2005

## Cloud Classification

Like plants and animals, clouds have a classification system. First developed by an English pharmacist and meteorologist named Luke Howard in 1803, the system groups clouds two ways: by appearance and by height above the earth's surface. Latin names describe appearance — cumulus (heaping), stra-

tus (layered), cirrus (curled) and nimbus (rain) — and height—middle (alto) and high (cirro). When combined, they create names that adequately describe many cloud types. The following table is a simplification of the classification system with examples of names of common clouds.

Name	Low	Middle (Alto)	High (Cirro)
Cumulus (heaping)	Cumulus	Alto cumulus	Cirrocumulus
Stratus (layered)	Stratus	Altostratus	Cirrostratus
Cirrus (curled)		Cirrus	

weather. Download the *Cloud Survey Sheet* at [http://www.cdli.ca/CITE/cloud\\_survey.pdf](http://www.cdli.ca/CITE/cloud_survey.pdf). Use the survey to answer the following questions.

- What clouds formed high, middle and low in the sky?
  - What cloud types were associated with sunny, cloudy and rainy weather?
  - Did wind direction affect cloud types observed?
  - Did cloud types change as the day progressed?
4. Combine Science, Photography and Computer Badges by having Scouts photograph clouds for a couple of weeks. Upload the images to a computer and do a presentation on clouds using Microsoft's PowerPoint or some other multimedia software.

### Be A Storm Spotter

Before the development of modern weather instruments, sailors, farmers and ordinary folk depended on a keen and experienced eye to predict changes in the weather. Most of their observations were based on wind direction and changes in the types of clouds appearing on the horizon or moving overhead. While an outdoor activity might be planned around a favourable weather forecast, local and regional conditions can quickly change. Scouts should be able to predict these weather changes based on changes in the clouds overhead. Observing an ever-increasing vertical development in cumulus clouds, for example, could forecast a thunderstorm that will likely pass by evening. Observing a gradual lowering of the cloud base from cirrus to nimbostratus clouds for example, signals the approach of a storm system that could last for several days. The following web sites will help:

- How to be a Storm Spotter (<http://www.boatsafe.com/kids/weather1.htm>)
- Tips for Forecasting the Weather (<http://eo.ucar.edu/webweather/forecasttips.html>)

### Cloudy Weather Lore

Weather, the condition of the atmosphere at a particular place and time, is influenced by the presence or absence of clouds. Lore, a traditional belief built on observations rather than scientific fact, is often used to explain things. Weather lore, a combination of the two, is a series of rhyming proverbs and sayings passed on from generation to the next over hundreds of years.

## Clouds in a Bottle

**F**ollow the steps below to create your own cloud in a bottle.

*Materials:* 2 litre or other large glass bottle, water, wooden matches, rubber gloves, desk lamp, duct tape or rubber band.

*What to do:*

- Pour about 100 ml of coloured warm water, (enough to cover the bottom), in a large glass jar. (The warm water will add moisture to the air inside the bottle.)
- Swirl the water for a minute. (This increases evaporation to moisten the air inside the jar.)
- Light a match. Blow it out and quickly place it, still smoking, inside the bottle. (The smoke will provide particles around which the water vapour will condense.)
- Place a rubber glove with the fingers pointing down inside the jar. Stretch the top of the glove to cover the opening. Seal with duct tape or a wide rubber band if necessary. (Sealing the jar will not allow any air to enter or es-

cape the jar thus allowing the air pressure inside to change.)

- Shine a desk lamp on the bottle. (This illuminates the inside of the bottle making the cloud more visible.)
- Insert your hand into the glove. Make a fist and then slowly pull your hand upwards. (This reduces the amount of matter inside the bottle thus lowering the air pressure and temperature.)
- Surprise! The inside of the jar should become cloudy. (When the glove is pushed back inside the bottle, pressure is increased and the cloudiness should disappear.)
- Repeat steps 6-7 to see the cloud appear and disappear.

*Reference: Create a Portable Cloud, <http://eo.ucar.edu/webweather/cloudact2.html>.*



Weather lore existed to instruct farmers, sailors, herdsman, and others on how to predict the weather. Its poetic nature made it easier to pass on to later generations. Today, meteorologists make use of satellites, weather balloons, super computers, Doppler radar, and a complex communications network to produce reasonably accurate daily weather forecasts.

*"If a circle forms 'round the moon, t'will be rain soon."*

The circle that forms around the sun or moon is called a halo. Halos form when light from the sun or moon refract as they pass through the ice crystals that form high-level cirrus and cirrostratus clouds. These clouds do not produce rain or snow, but they often precede an advancing low pressure system which may bring bad weather.

Below are some other weather lore statements.

- When clouds look like rocks and towers, the earth will be refreshed by showers.* (Developing cumulus clouds often bring thunderstorms and rain showers.)
- When clouds look like a mare's tail, rain will soon prevail.*

(These are cirrus clouds and often precede stormy weather.)

- When clouds look like black smoke, a wise man will put on his cloak.* (Dark clouds are moisture laden and often bring windy and rainy weather.)
- When clouds are present high and low, the greater the chance of rain or snow.* (This means a thick cloud layer which includes moisture laden nimbus clouds.)

For more examples of weather lore check out *Skywatch Signs of Weather* at <http://www.wilstar.com/skywatch.htm>. X

*Linking to Strategic Direction #1.*

*– Jim Cornish is an avid weather watcher living in Gander, Newfoundland, where the weather changes often. He's also a fifth grade teacher and writer. To assist leaders with cloud resources, he's compiled a Web site featuring more activities and ideas at: <http://cdli.ca/CITE/scouts/index.htm>. You'll also find references for the Bug Article written in the March 2006 Leader Magazine.*