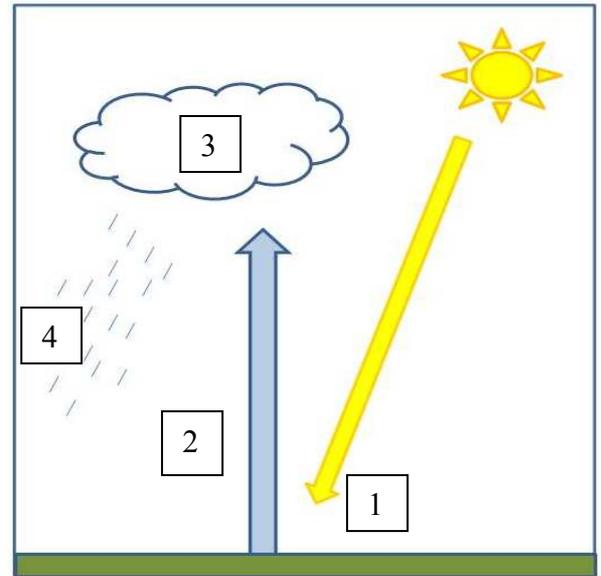


RAINFALL (PRECIPITATION) – CONVECTIONAL

Convictional rainfall occurs when the sun's energy (or **insolation**) heats the earth's surface (1) and causes water to evaporate changing to **water vapour**. This warm, moist air then rises (2) and as it rises it cools. The air reaches a point called the condensation level where it has cooled to such an extent that the water vapour condenses and turns back to a liquid form. This process of **condensation** high in the atmosphere leads to the development of clouds (3). As the clouds continue to grow the weight of the water droplets can eventually lead to **precipitation** (4).



Convictional storms occur in many areas of the world. They are at their most severe in parts of the tropics where there is a water source and intense heating. They are also common in warm mountain areas like the European Alps in the summer. This photograph shows towering cloud developed by strong rising air currents. This convectional storm occurred near Sydney in 2002. There was heavy rain and hail. Hail stones develop when ice particles form in the cloud. The currents of air move the particles up and down in the cloud and as this happens additional layers of ice form around the nucleus. Eventually the hailstones becomes too heavy to be kept up and they fall to the ground.

This website has some useful photographs and video clips.

http://australiasevereweather.com/storm_news/2002/docs/200202-01.htm

Convective storms affect people's lives in many ways. They can present various hazards to aircraft including turbulence and freezing at high altitudes. The following is based on an extreme weather summary for south Kansas in the USA.

Source: Kansas 2006 <http://www.crh.noaa.gov/ict/newsletter/Spring2006.php>

The convective storm started when hail 5 to 10 cms diameter hit a number of rural counties. Between 6:00 and 7:00 pm, one of the super-cellular severe storms in Reno County unleashed its power and caused disastrous and tragic results. The storm produced 80-100 mph winds on its southern end which raked south and southeast Reno County. This storm then took aim at Cheney Lake and State Park. The damage at the state park was major, and included the marina, around 125 boats, 35 campers, and an unspecified number of mobile homes. One mobile home was leveled. Total damage estimated around 12.5 million dollars. Six people were injured, all of whom required transport to Wichita hospitals. One man was killed when his fishing boat was overturned.

On June 30th, Southeast Kansas was hit by destructive winds and hail that reached the size of baseballs. The baseball-sized hail hit parts of Woodson County around 7:35 pm, causing around \$415,000 damage to crops. As the evening progressed, the severe thunderstorms, continued to unleash 80-100 mph winds. Hardest hit was Neosho County. In Chanute, large trees were uprooted with many falling onto homes and businesses. Other homes and businesses were completely unroofed. Numerous barns and sheds were destroyed. The towns of Erie and St. Paul experienced nearly identical fates. In Erie, one home was destroyed. In St. Paul, a church steeple was completely removed. Obviously, many power lines and power poles were blown down, severing power to all three towns. This round of atmospheric mayhem was responsible for \$2.873 million damage to crops and property.

Another product of severe convection that drew considerable attention in 2005 was the flash flood. The first major event occurred June 8th and 9th from around 8:00 pm the evening of the 8th to the early afternoon of the 9th. Hardest hit were Butler, Harvey and Sedgwick counties.

In Butler County, two families required rescues from their homes 4 miles north of Whitewater. Numerous streets were barricaded in and around El Dorado, and creeks overflowed. The most notable occurred 2 miles northeast of Elbing, where Henry Creek overflowed, closing 150th Street as well as the 150th Street Bridge. In Harvey County, widespread 12-15 inch rainfalls in approximately 10 hours resulted in evacuations in Newton, where most streets were barricaded. Perhaps the worst flooding in this event occurred in Sedgwick, where an estimated 147,515 acres of farmland were inundated totaling an estimated \$1.5 million damage.

In Sedgwick County, 19 homes were flooded, of which 12 were mobile. These homes were completely surrounded by flooding; which isolated their occupants from the outside world. In Mt. Hope, people required rescue from their homes. Many streets and highways were barricaded, especially across Northern Sedgwick County, where flash floods reached 6 foot depths. The flooding inundated around 75,000 acres of farmland. Total property damage was estimated at \$150,000.

ACTIVITIES

1. Study the article above. Summarise as a list the impacts of the convective storms in Kansas.
2. Produce an article on the hail storm that affected Sydney in 1999. This could be done in Word, Publisher or PowerPoint. Enter *hail storm Sydney 1999* into a search engine like Google. You should find some interesting articles and some amazing photographs!