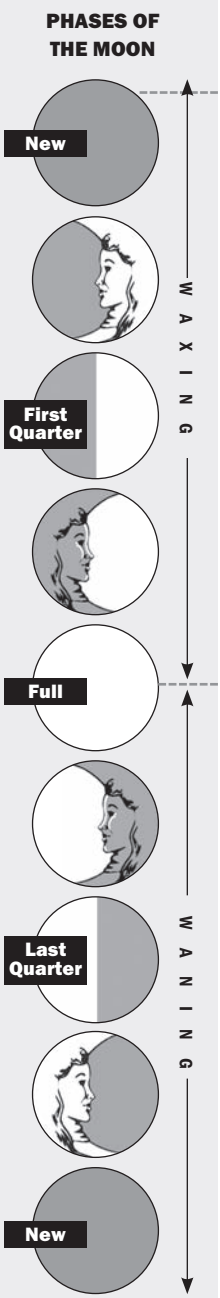
A Reference Compendium



The Origin of Full-Moon Names

■ Historically, the Native Americans who lived in the area that is now the northern and eastern United States kept track of the seasons by giving a distinctive name to each recurring full Moon. This name was applied to the entire month in which it occurred. These names, and some variations, were used by the Algonquin tribes from New England to Lake Superior.

Name	Month	Variations
Full Wolf Moon	**January**	Full Old Moon
Full Snow Moon	**February**	Full Hunger Moon
Full Worm Moon	**March**	Full Crow Moon Full Crust Moon Full Sugar Moon Full Sap Moon
Full Pink Moon	**April**	Full Sprouting Grass Moon Full Egg Moon Full Fish Moon
Full Flower Moon	**May**	Full Corn Planting Moon Full Milk Moon
Full Strawberry Moon	**June**	Full Rose Moon Full Hot Moon
Full Buck Moon	**July**	Full Thunder Moon Full Hay Moon
Full Sturgeon Moon	**August**	Full Red Moon Full Green Corn Moon
Full Harvest Moon*	**September**	Full Corn Moon Full Barley Moon
Full Hunter's Moon	**October**	Full Travel Moon Full Dying Grass Moon
Full Beaver Moon	**November**	Full Frost Moon
Full Cold Moon	**December**	Full Long Nights Moon

**The Harvest Moon is always the full Moon closest to the autumnal equinox. If the Harvest Moon occurs in October, the September full Moon is usually called the Corn Moon.*

When Will the Moon Rise Today?

■ A lunar puzzle involves the timing of moonrise. If you enjoy the out-of-doors and the wonders of nature, you may wish to commit to memory the following gem:

The new Moon always rises near sunrise;

The first quarter near noon;

The full Moon always rises near sunset;

The last quarter near midnight.

Moonrise occurs about 50 minutes later each day.

Many Moons Ago

January's full Moon was called the **Wolf Moon** because it appeared when wolves howled in hunger outside the villages.

February's full Moon was called the **Snow Moon** because it was a time of heavy snow. It was also called the **Hunger Moon** because hunting was difficult and hunger often resulted.

March's full Moon was called the **Worm Moon** because, as the Sun increasingly warmed the soil, earthworms became active and their castings (excrement) began to appear.

April's full Moon was called the **Pink Moon** because it heralded the appearance of the moss pink, or wild ground phlox—one of the first spring flowers.

May's full Moon was called the **Flower Moon** because blossoms were abundant everywhere at this time.

June's full Moon was called the **Strawberry Moon** because it appeared when the strawberry harvest took place.

July's full Moon was called the **Buck Moon** because it arrived when male deer started growing new antlers.

August's full Moon was called the **Sturgeon Moon** because this large fish, which is found in the Great Lakes and Lake Champlain, was caught easily at this time.

September's full Moon was called the **Corn Moon** because this was the time to harvest corn.

The **Harvest Moon** is the full Moon that occurs closest to the autumnal equinox. It can occur in either **September** or **October.** At this time, crops such as corn, pumpkins, squash, and wild rice are ready for gathering.

October's full Moon was called the **Hunter's Moon** because this was the time to hunt in preparation for winter.

November's full Moon was called the **Beaver Moon** because it was the time to set beaver traps, before the waters froze over.

December's full Moon was called the **Cold Moon.** It was also called the **Long Nights Moon** because nights at this time of year were the longest.

The Origin of Month Names

January. For the Roman god Janus, protector of gates and doorways. Janus is depicted with two faces, one looking into the past, the other into the future.

February. From the Latin *februa,* "to cleanse." The Roman Februalia was a month of purification and atonement.

March. For the Roman god of war, Mars. This was the time of year to resume military campaigns that had been interrupted by winter.

April. From the Latin *aperio,* "to open (bud)," because plants begin to grow now.

May. For the Roman goddess Maia, who oversaw the growth of plants. Also from the Latin *maiores,* "elders," who were celebrated now.

June. For the Roman goddess Juno, patroness of marriage and the well-being of women. Also from the Latin *juvenis,* "young people."

July. To honor Roman dictator Julius Caesar (100 B.C.–44 B.C.). In 46 B.C., with the help of Sosigenes, he developed the Julian calendar, the precursor to the Gregorian calendar we use today.

August. To honor the first Roman emperor (and grandnephew of Julius Caesar), Augustus Caesar (63 B.C.–A.D. 14).

September. From the Latin *septem,* "seven," because this was the seventh month of the early Roman calendar.

October. From the Latin *octo,* "eight," because this was the eighth month of the early Roman calendar.

November. From the Latin *novem,* "nine," because this was the ninth month of the early Roman calendar.

December. From the Latin *decem,* "ten," because this was the tenth month of the early Roman calendar.

Easter Dates (2013–17)

■ Christian churches that follow the Gregorian calendar celebrate Easter on the first Sunday after the paschal full Moon on or just after the vernal equinox.

YEAR	EASTER
2013	March 31
2014	April 20
2015	April 5
2016	March 27
2017	April 16

■ Eastern Orthodox churches follow the Julian calendar.

YEAR	EASTER
2013	May 5
2014	April 20
2015	April 12
2016	May 1
2017	April 16

Friggatriskaidekaphobia Trivia

Here are a few facts about Friday the 13th:

■ In the 14 possible configurations for the annual calendar (see any perpetual calendar), the occurrence of Friday the 13th is this:

6 of 14 years have one Friday the 13th.
6 of 14 years have two Fridays the 13th.
2 of 14 years have three Fridays the 13th.

■ No year is without one Friday the 13th, and no year has more than three.

■ 2013 has two Fridays the 13th, in September and December.

■ Months that have a Friday the 13th begin on a Sunday.

The Origin of Day Names

■ The days of the week were named by ancient Romans with the Latin words for the Sun, the Moon, and the five known planets. These names have survived in European languages, but English names also reflect Anglo-Saxon and Norse influences.

English	Latin	French	Italian	Spanish	Anglo-Saxon and Norse
SUNDAY	dies Solis (Sol's day)	dimanche	domenica	domingo	Sunnandaeg (Sun's day)
		from the Latin for "Lord's day"			
MONDAY	dies Lunae (Luna's day)	lundi	lunedì	lunes	Monandaeg (Moon's day)
TUESDAY	dies Martis (Mars's day)	mardi	martedì	martes	Tiwesdaeg (Tiw's day)
WEDNESDAY	dies Mercurii (Mercury's day)	mercredi	mercoledì	miércoles	Wodnesdaeg (Woden's day)
THURSDAY	dies Jovis (Jupiter's day)	jeudi	giovedì	jueves	Thursdaeg (Thor's day)
FRIDAY	dies Veneris (Venus's day)	vendredi	venerdì	viernes	Frigedaeg (Frigga's day)
SATURDAY	dies Saturni (Saturn's day)	samedi	sabato	sábado	Saeterndaeg (Saturn's day)
		from the Latin for "Sabbath"			

How to Find the Day of the Week for Any Given Date

To compute the day of the week for any given date as far back as the mid−18th century, proceed as follows:

■ Add the last two digits of the year to one-quarter of the last two digits (discard any remainder), the day of the month, and the month key from the key box below. Divide the sum by 7; the remainder is the day of the week (1 is Sunday, 2 is Monday, and so on). If there is no remainder, the day is Saturday. If you're searching for a weekday prior to 1900, add 2 to the sum before dividing; prior to 1800, add 4. The formula doesn't work for days prior to 1753. From 2000 through 2099, subtract 1 from the sum before dividing.

KEY

January	1
leap year	0
February	4
leap year	3
March	4
April	0
May	2
June	5
July	0
August	3
September	6
October	1
November	4
December	6

Example:

The Dayton Flood was on March 25, 1913.

Last two digits of year:	13
One-quarter of these two digits:	3
Given day of month:	25
Key number for March:	4
Sum:	45

45 ÷ 7 = 6, with a remainder of 3. The flood took place on Tuesday, the third day of the week.

Animal Signs of the Chinese Zodiac

■ The animal designations of the Chinese zodiac follow a 12-year cycle and are always used in the same sequence. The Chinese year of 354 days begins 3 to 7 weeks into the western 365-day year, so the animal designation changes at that time, rather than on January 1. **See page 103** for the exact date of the start of the Chinese New Year.

Rat

Ambitious and sincere, you can be generous with your money. Compatible with the dragon and the monkey. Your opposite is the horse.

1900	**1936**	**1984**
1912	**1948**	**1996**
1924	**1960**	**2008**
	1972	

Ox or Buffalo

A leader, you are bright, patient, and cheerful. Compatible with the snake and the rooster. Your opposite is the sheep.

1901	**1937**	**1985**
1913	**1949**	**1997**
1925	**1961**	**2009**
	1973	

Tiger

Forthright and sensitive, you possess great courage. Compatible with the horse and the dog. Your opposite is the monkey.

1902	**1938**	**1986**
1914	**1950**	**1998**
1926	**1962**	**2010**
	1974	

Rabbit or Hare

Talented and affectionate, you are a seeker of tranquility. Compatible with the sheep and the pig. Your opposite is the rooster.

1903	**1939**	**1987**
1915	**1951**	**1999**
1927	**1963**	**2011**
	1975	

Dragon

Robust and passionate, your life is filled with complexity. Compatible with the monkey and the rat. Your opposite is the dog.

1904	**1940**	**1988**
1916	**1952**	**2000**
1928	**1964**	**2012**
	1976	

Snake

Strong-willed and intense, you display great wisdom. Compatible with the rooster and the ox. Your opposite is the pig.

1905	**1941**	**1989**
1917	**1953**	**2001**
1929	**1965**	**2013**
	1977	

Horse

Physically attractive and popular, you like the company of others. Compatible with the tiger and the dog. Your opposite is the rat.

1906	**1942**	**1990**
1918	**1954**	**2002**
1930	**1966**	**2014**
	1978	

Sheep or Goat

Aesthetic and stylish, you enjoy being a private person. Compatible with the pig and the rabbit. Your opposite is the ox.

1907	**1943**	**1991**
1919	**1955**	**2003**
1931	**1967**	**2015**
	1979	

Monkey

Persuasive, skillful, and intelligent, you strive to excel. Compatible with the dragon and the rat. Your opposite is the tiger.

1908	**1944**	**1992**
1920	**1956**	**2004**
1932	**1968**	**2016**
	1980	

Rooster or Cock

Seeking wisdom and truth, you have a pioneering spirit. Compatible with the snake and the ox. Your opposite is the rabbit.

1909	**1945**	**1993**
1921	**1957**	**2005**
1933	**1969**	**2017**
	1981	

Dog

Generous and loyal, you have the ability to work well with others. Compatible with the horse and the tiger. Your opposite is the dragon.

1910	**1946**	**1994**
1922	**1958**	**2006**
1934	**1970**	**2018**
	1982	

Pig or Boar

Gallant and noble, your friends will remain at your side. Compatible with the rabbit and the sheep. Your opposite is the snake.

1911	**1947**	**1995**
1923	**1959**	**2007**
1935	**1971**	**2019**
	1983	

A Table Foretelling the Weather Through All the Lunations of Each Year, or Forever

■ This table is the result of many years of actual observation and shows what sort of weather will probably follow the Moon's entrance into any of its quarters. For example, the table shows that the week following January 4, 2013, will be fair and frosty, because the Moon enters the last quarter that day at 10:58 P.M. EST. (See the **Left-Hand Calendar Pages, 104–130,** for 2013 Moon phases.)

Editor's note: Although the data in this table is taken into consideration in the yearlong process of compiling the annual long-range weather forecasts for *The Old Farmer's Almanac,* we rely far more on our projections of solar activity.

Time of Change	Summer	Winter
Midnight to 2 A.M.	Fair	Hard frost, unless wind is south or west
2 A.M. to 4 A.M.	Cold, with frequent showers	Snow and stormy
4 A.M. to 6 A.M.	Rain	Rain
6 A.M. to 8 A.M.	Wind and rain	Stormy
8 A.M. to 10 A.M.	Changeable	Cold rain if wind is west; snow, if east
10 A.M. to noon	Frequent showers	Cold with high winds
Noon to 2 P.M.	Very rainy	Snow or rain
2 P.M. to 4 P.M.	Changeable	Fair and mild
4 P.M. to 6 P.M.	Fair	Fair
6 P.M. to 10 P.M.	Fair if wind is northwest; rain if wind is south or southwest	Fair and frosty if wind is north or northeast; rain or snow if wind is south or southwest
10 P.M. to midnight	Fair	Fair and frosty

This table was created more than 175 years ago by Dr. Herschell for the Boston Courier; *it first appeared in* The Old Farmer's Almanac *in 1834.*

Safe Ice Thickness*

Ice Thickness	Permissible Load
3 inches	Single person on foot
4 inches	Group in single file
7½ inches	Passenger car (2-ton gross)
8 inches	Light truck (2½-ton gross)
10 inches	Medium truck (3½-ton gross)
12 inches	Heavy truck (8-ton gross)
15 inches	10 tons
20 inches	25 tons
30 inches	70 tons
36 inches	110 tons

***Solid, clear, blue/black pond and lake ice**

Slush ice has only half the strength of blue ice. The strength value of river ice is 15 percent less.

Heat Index °F (°C)

Temperature °F (°C)	RELATIVE HUMIDITY (%) 40	45	50	55	60	65	70	75	80
100 (38)	109 (43)	114 (46)	118 (48)	124 (51)	129 (54)	136 (58)			
98 (37)	105 (41)	109 (43)	113 (45)	117 (47)	123 (51)	128 (53)	134 (57)		
96 (36)	101 (38)	104 (40)	108 (42)	112 (44)	116 (47)	121 (49)	126 (52)	132 (56)	
94 (34)	97 (36)	100 (38)	103 (39)	106 (41)	110 (43)	114 (46)	119 (48)	124 (51)	129 (54)
92 (33)	94 (34)	96 (36)	99 (37)	101 (38)	105 (41)	108 (42)	112 (44)	116 (47)	121 (49)
90 (32)	91 (33)	93 (34)	95 (35)	97 (36)	100 (38)	103 (39)	106 (41)	109 (43)	113 (45)
88 (31)	88 (31)	89 (32)	91 (33)	93 (34)	95 (35)	98 (37)	100 (38)	103 (39)	106 (41)
86 (30)	85 (29)	87 (31)	88 (31)	89 (32)	91 (33)	93 (34)	95 (35)	97 (36)	100 (38)
84 (29)	83 (28)	84 (29)	85 (29)	86 (30)	88 (31)	89 (32)	90 (32)	92 (33)	94 (34)
82 (28)	81 (27)	82 (28)	83 (28)	84 (29)	84 (29)	85 (29)	86 (30)	88 (31)	89 (32)
80 (27)	80 (27)	80 (27)	81 (27)	81 (27)	82 (28)	82 (28)	83 (28)	84 (29)	84 (29)

EXAMPLE: *When the temperature is 88°F (31°C) and the relative humidity is 60 percent, the heat index,*

The UV Index for Measuring Ultraviolet Radiation Risk

The U.S. National Weather Service's daily forecasts of ultraviolet levels use these numbers for various exposure levels:

UV Index Number	Exposure Level	Time to Burn	Actions to Take
0, 1, 2	Minimal	60 minutes	Apply SPF 15 sunscreen
3, 4	Low	45 minutes	Apply SPF 15 sunscreen; wear a hat
5, 6	Moderate	30 minutes	Apply SPF 15 sunscreen; wear a hat
7, 8, 9	High	15–25 minutes	Apply SPF 15 to 30 sunscreen; wear a hat and sunglasses; limit midday exposure
10 or higher	Very high	10 minutes	Apply SPF 30 sunscreen; wear a hat, sunglasses, and protective clothing; limit midday exposure

"Time to Burn" and "Actions to Take" apply to people with fair skin that sometimes tans but usually burns. People with lighter skin need to be more cautious. People with darker skin may be able to tolerate more exposure.

85	90	95	100
135 (57)			
126 (52)	131 (55)		
117 (47)	122 (50)	127 (53)	132 (56)
110 (43)	113 (45)	117 (47)	121 (49)
102 (39)	105 (41)	108 (42)	112 (44)
96 (36)	98 (37)	100 (38)	103 (39)
90 (32)	91 (33)	93 (34)	95 (35)
85 (29)	86 (30)	86 (30)	87 (31)

or how hot it feels, is 95°F (35°C).

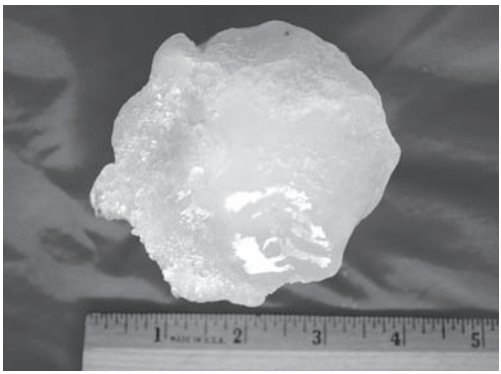
What Are Cooling/Heating Degree Days?

■ Each degree of a day's average temperature above 65°F is considered one cooling degree day, an attempt to measure the need for air-conditioning. If the average of the day's high and low temperatures is 75°, that's ten cooling degree days.

Similarly, each degree of a day's average temperature below 65° is considered one heating degree and is an attempt to measure the need for fuel consumption. For example, a day with temperatures ranging from 60° to 40° results in an average of 50°, or 15 degrees less than 65°. Hence, that day would be credited as 15 heating degree days.

How to Measure Hail

■ The **Torro Hailstorm Intensity Scale** was introduced by Jonathan Webb of Oxford, England, in 1986 as a means of categorizing hailstorms. The name derives from the private and mostly British research body named the TORnado and storm Research Organisation.



INTENSITY/DESCRIPTION OF HAIL DAMAGE	
H0	True hail of pea size causes no damage
H1	Leaves and flower petals are punctured and torn
H2	Leaves are stripped from trees and plants
H3	Panes of glass are broken; auto bodies are dented
H4	Some house windows are broken; small tree branches are broken off; birds are killed
H5	Many windows are smashed; small animals are injured; large tree branches are broken off
H6	Shingle roofs are breached; metal roofs are scored; wooden window frames are broken away
H7	Roofs are shattered to expose rafters; autos are seriously damaged
H8	Shingle and tile roofs are destroyed; small tree trunks are split; people are seriously injured
H9	Concrete roofs are broken; large tree trunks are split and knocked down; people are at risk of fatal injuries
H10	Brick houses are damaged; people are at risk of fatal injuries

How to Measure Wind Speed

■ The **Beaufort Wind Force Scale** is a common way of estimating wind speed. It was developed in 1805 by Admiral Sir Francis Beaufort of the British Navy to measure wind at sea. We can also use it to measure wind on land.

Admiral Beaufort arranged the numbers 0 to 12 to indicate the strength of the wind from calm, force 0, to hurricane, force 12. Here's a scale adapted to land.

"Used Mostly at Sea but of Help to All Who Are Interested in the Weather"

Beaufort Force	Description	When You See or Feel This Effect	Wind Speed (mph)	Wind Speed (km/h)
0	Calm	Smoke goes straight up	less than 1	less than 2
1	Light air	Wind direction is shown by smoke drift but not by wind vane	1–3	2–5
2	Light breeze	Wind is felt on the face; leaves rustle; wind vanes move	4–7	6–11
3	Gentle breeze	Leaves and small twigs move steadily; wind extends small flags straight out	8–12	12–19
4	Moderate breeze	Wind raises dust and loose paper; small branches move	13–18	20–29
5	Fresh breeze	Small trees sway; waves form on lakes	19–24	30–39
6	Strong breeze	Large branches move; wires whistle; umbrellas are difficult to use	25–31	40–50
7	Moderate gale	Whole trees are in motion; walking against the wind is difficult	32–38	51–61
8	Fresh gale	Twigs break from trees; walking against the wind is very difficult	39–46	62–74
9	Strong gale	Buildings suffer minimal damage; roof shingles are removed	47–54	75–87
10	Whole gale	Trees are uprooted	55–63	88–101
11	Violent storm	Widespread damage	64–72	102–116
12	Hurricane	Widespread destruction	73+	117+

Retired Atlantic Hurricane Names

These storms have been some of the most destructive and costly.

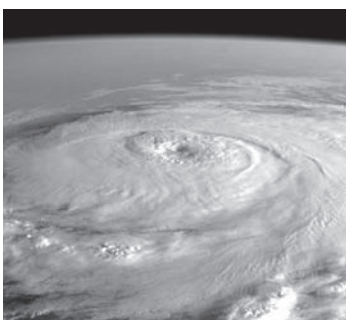
NAME	YEAR	NAME	YEAR	NAME	YEAR
Jeanne	2004	Wilma	2005	Ike	2008
Dennis	2005	Dean	2007	Paloma	2008
Katrina	2005	Felix	2007	Igor	2010
Rita	2005	Noel	2007	Tomas	2010
Stan	2005	Gustav	2008	Irene	2011

Atlantic Tropical (and Subtropical) Storm Names for 2013		
Andrea	Ingrid	Rebekah
Barry	Jerry	Sebastien
Chantal	Karen	Tanya
Dorian	Lorenzo	Van
Erin	Melissa	Wendy
Fernand	Nestor	
Gabrielle	Olga	
Humberto	Pablo	

Eastern North-Pacific Tropical (and Subtropical) Storm Names for 2013		
Alvin	Ivo	Raymond
Barbara	Juliette	Sonia
Cosme	Kiko	Tico
Dalila	Lorena	Velma
Erick	Manuel	Wallis
Flossie	Narda	Xina
Gil	Octave	York
Henriette	Priscilla	Zelda

How to Measure Hurricane Strength

■ The **Saffir-Simpson Hurricane Scale** assigns a rating from 1 to 5 based on a hurricane's intensity. It is used to give an estimate of the potential property damage and flooding expected along the coast from a hurricane landfall. Wind speed is the determining factor in the scale, as storm surge values are highly dependent on the slope of the continental shelf in the landfall region. Wind speeds are measured using a 1-minute average.



Category One. Average wind: 74–95 mph. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal road flooding and minor pier damage.

Category Two. Average wind: 96–110 mph. Some roofing material, door, and window damage to buildings. Considerable damage to vegetation, mobile homes, and piers. Coastal and low-lying escape routes flood 2 to 4 hours before arrival of center. Small craft in unprotected anchorages break moorings.

Category Three. Average wind: 111–130 mph. Some structural damage to small residences and utility buildings; minor amount of curtainwall failures. Mobile homes destroyed. Flooding near coast destroys smaller structures; larger structures damaged by floating debris.

Category Four. Average wind: 131–155 mph. More extensive curtainwall failures with some complete roof failures on small residences. Major beach erosion. Major damage to lower floors near the shore.

Category Five. Average wind: 156+ mph. Complete roof failures on many residences and industrial buildings. Some complete building failures; small buildings blown over or away. Major damage to lower floors located less than 15 feet above sea level (ASL) and within 500 yards of the shoreline.

How to Measure a Tornado

■ The original **Fujita Scale** (or F Scale) was developed by Dr. Theodore Fujita to classify tornadoes based on wind damage. All tornadoes, and other severe local windstorms, were assigned a number according to the most intense damage caused by the storm. An enhanced F (EF) scale was implemented in the United States on February 1, 2007. The EF scale uses 3-second gust estimates based on a more detailed system for assessing damage, taking into account different building materials.

F SCALE		EF SCALE (U.S.)
F0 • 40–72 mph (64–116 km/h)	light damage	EF0 • 65–85 mph (105–137 km/h)
F1 • 73–112 mph (117–180 km/h)	moderate damage	EF1 • 86–110 mph (138–178 km/h)
F2 • 113–157 mph (181–253 km/h)	considerable damage	EF2 • 111–135 mph (179–218 km/h)
F3 • 158–207 mph (254–332 km/h)	severe damage	EF3 • 136–165 mph (219–266 km/h)
F4 • 208–260 mph (333–419 km/h)	devastating damage	EF4 • 166–200 mph (267–322 km/h)
F5 • 261–318 mph (420–512 km/h)	incredible damage	EF5 • over 200 mph (over 322 km/h)

Wind/Barometer Table

Barometer (Reduced to Sea Level)	Wind Direction	Character of Weather Indicated
30.00 to 30.20, and steady	westerly	Fair, with slight changes in temperature, for one to two days
30.00 to 30.20, and rising rapidly	westerly	Fair, followed within two days by warmer and rain
30.00 to 30.20, and falling rapidly	south to east	Warmer, and rain within 24 hours
30.20 or above, and falling rapidly	south to east	Warmer, and rain within 36 hours
30.20 or above, and falling rapidly	west to north	Cold and clear, quickly followed by warmer and rain
30.20 or above, and steady	variable	No early change
30.00 or below, and falling slowly	south to east	Rain within 18 hours that will continue a day or two
30.00 or below, and falling rapidly	southeast to northeast	Rain, with high wind, followed within two days by clearing, colder
30.00 or below, and rising	south to west	Clearing and colder within 12 hours
29.80 or below, and falling rapidly	south to east	Severe storm of wind and rain imminent; in winter, snow or cold wave within 24 hours
29.80 or below, and falling rapidly	east to north	Severe northeast gales and heavy rain or snow, followed in winter by cold wave
29.80 or below, and rising rapidly	going to west	Clearing and colder

Note: *A barometer should be adjusted to show equivalent sea-level pressure for the altitude at which it is to be used. A change of 100 feet in elevation will cause a decrease of 1/10 inch in the reading.*

Windchill Table

■ As wind speed increases, your body loses heat more rapidly, making the air feel colder than it really is. The combination of cold temperature and high wind can create a cooling effect so severe that exposed flesh can freeze.

	TEMPERATURE (°F)														
WIND SPEED (mph)	Calm	35	30	25	20	15	10	5	0	–5	–10	–15	–20	–25	–30	–35
	5	31	25	19	13	7	1	–5	–11	–16	–22	–28	–34	–40	–46	–52
	10	27	21	15	9	3	–4	–10	–16	–22	–28	–35	–41	–47	–53	–59
	15	25	19	13	6	0	–7	–13	–19	–26	–32	–39	–45	–51	–58	–64
	20	24	17	11	4	–2	–9	–15	–22	–29	–35	–42	–48	–55	–61	–68
	25	23	16	9	3	–4	–11	–17	–24	–31	–37	–44	–51	–58	–64	–71
	30	22	15	8	1	–5	–12	–19	–26	–33	–39	–46	–53	–60	–67	–73
	35	21	14	7	0	–7	–14	–21	–27	–34	–41	–48	–55	–62	–69	–76
	40	20	13	6	–1	–8	–15	–22	–29	–36	–43	–50	–57	–64	–71	–78
	45	19	12	5	–2	–9	–16	–23	–30	–37	–44	–51	–58	–65	–72	–79
	50	19	12	4	–3	–10	–17	–24	–31	–38	–45	–52	–60	–67	–74	–81
	55	18	11	4	–3	–11	–18	–25	–32	–39	–46	–54	–61	–68	–75	–82
	60	17	10	3	–4	–11	–19	–26	–33	–40	–48	–55	–62	–69	–76	–84

Frostbite occurs in 30 minutes 10 minutes 5 minutes

EXAMPLE: When the temperature is 15°F and the wind speed is 30 miles per hour, the windchill, or how cold it feels, is –5°F. For a Celsius version of this table, visit Almanac.com/WindchillCelsius.

–courtesy National Weather Service

How to Measure Earthquakes

■ In 1979, seismologists developed a measurement of earthquake size called **Moment Magnitude.** It is more accurate than the previously used Richter scale, which is precise only for earthquakes of a certain size and at a certain distance from a seismometer. All earthquakes can now be compared on the same scale.

Magnitude	Effect
Less than 3	Micro
3–3.9	Minor
4–4.9	Light
5–5.9	Moderate
6–6.9	Strong
7–7.9	Major
8 or more	Great

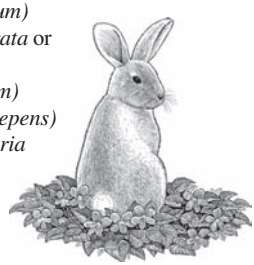
A Gardener's Worst Phobias

Name of Fear	Object Feared
Alliumphobia	Garlic
Anthophobia	Flowers
Apiphobia	Bees
Arachnophobia	Spiders
Batonophobia	Plants
Bufonophobia	Toads
Dendrophobia	Trees
Entomophobia	Insects
Lachanophobia	Vegetables
Melissophobia	Bees
Mottephobia	Moths
Myrmecophobia	Ants
Ornithophobia	Birds
Ranidaphobia	Frogs
Rupophobia	Dirt
Scoleciphobia	Worms
Spheksophobia	Wasps

Herbs to Plant in Lawns

Choose plants that suit your soil and your climate. All these can withstand mowing and considerable foot traffic.

Ajuga or bugleweed *(Ajuga reptans)*
Corsican mint *(Mentha requienii)*
Dwarf cinquefoil *(Potentilla tabernaemontani)*
English pennyroyal *(Mentha pulegium)*
Green Irish moss *(Sagina subulata)*
Pearly everlasting *(Anaphalis margaritacea)*
Roman chamomile *(Chamaemelum nobile)*
Rupturewort *(Herniaria glabra)*
Speedwell *(Veronica officinalis)*
Stonecrop *(Sedum ternatum)*
Sweet violets (*Viola odorata* or *V. tricolor*)
Thyme *(Thymus serpyllum)*
White clover *(Trifolium repens)*
Wild strawberries *(Fragaria virginiana)*
Wintergreen or partridgeberry *(Mitchella repens)*



Lawn-Growing Tips

■ Test your soil: The pH balance should be 7.0 or more; 6.2 to 6.7 puts your lawn at risk for fungal diseases. If the pH is too low, correct it with liming, best done in the fall.

■ The best time to apply fertilizer is just before it rains.

■ If you put lime and fertilizer on your lawn, spread half of it as you walk north to south, the other half as you walk east to west to cut down on missed areas.

■ Any feeding of lawns in the fall should be done with a low-nitrogen, slow-acting fertilizer.

■ In areas of your lawn where tree roots compete with the grass, apply some extra fertilizer to benefit both.

■ Moss and sorrel in lawns usually means poor soil, poor aeration or drainage, or excessive acidity.

■ Control weeds by promoting healthy lawn growth with natural fertilizers in spring and early fall.

■ Raise the level of your lawn-mower blades during the hot summer days. Taller grass resists drought better than short.

■ You can reduce mowing time by redesigning your lawn, reducing sharp corners and adding sweeping curves.

■ During a drought, let the grass grow longer between mowings, and reduce fertilizer.

■ Water your lawn early in the morning or in the evening.

Flowers and Herbs That Attract Butterflies

Allium . . . . . *Allium*
Aster . . . . . *Aster*
Bee balm . . . . . *Monarda*
Butterfly bush . . . . . *Buddleia*
Catmint . . . . . *Nepeta*
Clove pink . . . . . *Dianthus*
Cornflower . . . . . *Centaurea*
Creeping thyme . . . . . *Thymus serpyllum*
Daylily . . . . . *Hemerocallis*
Dill . . . . . *Anethum graveolens*
False indigo . . . . . *Baptisia*
Fleabane . . . . . *Erigeron*
Floss flower . . . . . *Ageratum*
Globe thistle . . . . . *Echinops*
Goldenrod . . . . . *Solidago*
Helen's flower . . . . . *Helenium*
Hollyhock . . . . . *Alcea*
Honeysuckle . . . . . *Lonicera*
Lavender . . . . . *Lavandula*
Lilac . . . . . *Syringa*
Lupine . . . . . *Lupinus*
Lychnis . . . . . *Lychnis*
Mallow . . . . . *Malva*
Mealycup sage . . . . . *Salvia farinacea*
Milkweed . . . . . *Asclepias*
Mint . . . . . *Mentha*
Oregano . . . . . *Origanum vulgare*
Pansy . . . . . *Viola*
Parsley . . . . . *Petroselinum crispum*
Phlox . . . . . *Phlox*
Privet . . . . . *Ligustrum*
Purple coneflower . . . *Echinacea purpurea*
Rock cress . . . . . *Arabis*
Sea holly . . . . . *Eryngium*
Shasta daisy . . . . . *Chrysanthemum*
Snapdragon . . . . . *Antirrhinum*
Stonecrop . . . . . *Sedum*
Sweet alyssum . . . . . *Lobularia*
Sweet marjoram . . . . *Origanum majorana*
Sweet rocket . . . . . *Hesperis*
Tickseed . . . . . *Coreopsis*
Verbena . . . . . *Verbena*
Zinnia . . . . . *Zinnia*

Flowers* That Attract Hummingbirds

Beard tongue . . . . . *Penstemon*
Bee balm . . . . . *Monarda*
Butterfly bush . . . . . *Buddleia*
Catmint . . . . . *Nepeta*
Clove pink . . . . . *Dianthus*
Columbine . . . . . *Aquilegia*
Coral bells . . . . . *Heuchera*
Daylily . . . . . *Hemerocallis*
Desert candle . . . . . *Yucca*
Flag iris . . . . . *Iris*
Flowering tobacco . . . . . *Nicotiana alata*
Foxglove . . . . . *Digitalis*
Larkspur . . . . . *Delphinium*
Lily . . . . . *Lilium*
Lupine . . . . . *Lupinus*
Petunia . . . . . *Petunia*
Pincushion flower . . . . . *Scabiosa*
Red-hot poker . . . . . *Kniphofia*
Scarlet sage . . . . . *Salvia splendens*
Soapwort . . . . . *Saponaria*
Summer phlox . . . . . *Phlox paniculata*
Trumpet honeysuckle . . . . . *Lonicera sempervirens*
Verbena . . . . . *Verbena*
Weigela . . . . . *Weigela*

*Note: Choose varieties in red and orange shades, if available.

REFERENCE

pH Preferences of Trees, Shrubs, Vegetables, and Flowers

■ An accurate soil test will indicate your soil pH and will specify the amount of lime or sulfur that is needed to bring it up or down to the appropriate level. A pH of 6.5 is just about right for most home gardens, since most plants thrive in the 6.0 to 7.0 (slightly acidic to neutral) range. Some plants (azaleas, blueberries) prefer more strongly acidic soil in the 4.0 to 6.0 range, while a few (asparagus, plums) do best in soil that is neutral to slightly alkaline. Acidic, or sour, soil (below 7.0) is counteracted by applying finely ground limestone, and alkaline, or sweet, soil (above 7.0) is treated with ground sulfur.

Common Name	Optimum pH Range
Trees and Shrubs	
Apple	5.0–6.5
Ash	6.0–7.5
Azalea	4.5–6.0
Basswood	6.0–7.5
Beautybush	6.0–7.5
Birch	5.0–6.5
Blackberry	5.0–6.0
Blueberry	4.0–5.0
Boxwood	6.0–7.5
Cherry, sour	6.0–7.0
Chestnut	5.0–6.5
Crab apple	6.0–7.5
Dogwood	5.0–7.0
Elder, box	6.0–8.0
Fir, balsam	5.0–6.0
Fir, Douglas	6.0–7.0
Hemlock	5.0–6.0
Hydrangea, blue-flowered	4.0–5.0
Hydrangea, pink-flowered	6.0–7.0
Juniper	5.0–6.0
Laurel, mountain	4.5–6.0
Lemon	6.0–7.5
Lilac	6.0–7.5
Maple, sugar	6.0–7.5
Oak, white	5.0–6.5
Orange	6.0–7.5
Peach	6.0–7.0
Pear	6.0–7.5
Pecan	6.4–8.0
Pine, red	5.0–6.0
Pine, white	4.5–6.0
Plum	6.0–8.0
Raspberry, red	5.5–7.0
Rhododendron	4.5–6.0
Spruce	5.0–6.0
Walnut, black	6.0–8.0
Willow	6.0–8.0
Vegetables	
Asparagus	6.0–8.0
Bean, pole	6.0–7.5
Beet	6.0–7.5
Broccoli	6.0–7.0
Brussels sprout	6.0–7.5
Carrot	5.5–7.0
Cauliflower	5.5–7.5
Celery	5.8–7.0
Chive	6.0–7.0
Cucumber	5.5–7.0
Garlic	5.5–8.0
Kale	6.0–7.5
Lettuce	6.0–7.0
Pea, sweet	6.0–7.5
Pepper, sweet	5.5–7.0
Potato	4.8–6.5
Pumpkin	5.5–7.5
Radish	6.0–7.0
Spinach	6.0–7.5
Squash, crookneck	6.0–7.5
Squash, Hubbard	5.5–7.0
Tomato	5.5–7.5
Flowers	
Alyssum	6.0–7.5
Aster, New England	6.0–8.0
Baby's breath	6.0–7.0
Bachelor's button	6.0–7.5
Bee balm	6.0–7.5
Begonia	5.5–7.0
Black-eyed Susan	5.5–7.0
Bleeding heart	6.0–7.5
Canna	6.0–8.0
Carnation	6.0–7.0
Chrysanthemum	6.0–7.5
Clematis	5.5–7.0
Coleus	6.0–7.0
Coneflower, purple	5.0–7.5
Cosmos	5.0–8.0
Crocus	6.0–8.0
Daffodil	6.0–6.5
Dahlia	6.0–7.5
Daisy, Shasta	6.0–8.0
Daylily	6.0–8.0
Delphinium	6.0–7.5
Foxglove	6.0–7.5
Geranium	6.0–8.0
Gladiolus	5.0–7.0
Hibiscus	6.0–8.0
Hollyhock	6.0–8.0
Hyacinth	6.5–7.5
Iris, blue flag	5.0–7.5
Lily-of-the-valley	4.5–6.0
Lupine	5.0–6.5
Marigold	5.5–7.5
Morning glory	6.0–7.5
Narcissus, trumpet	5.5–6.5
Nasturtium	5.5–7.5
Pansy	5.5–6.5
Peony	6.0–7.5
Petunia	6.0–7.5
Phlox, summer	6.0–8.0
Poppy, oriental	6.0–7.5
Rose, hybrid tea	5.5–7.0
Rose, rugosa	6.0–7.0
Snapdragon	5.5–7.0
Sunflower	6.0–7.5
Tulip	6.0–7.0
Zinnia	5.5–7.0

Produce Weights and Measures

Vegetables

Asparagus: 1 pound = 3 cups chopped
Beans (string): 1 pound = 4 cups chopped
Beets: 1 pound (5 medium) = 2½ cups chopped
Broccoli: 1 pound = 6 cups chopped
Cabbage: 1 pound = 4½ cups shredded
Carrots: 1 pound = 3½ cups sliced or grated
Celery: 1 pound = 4 cups chopped
Cucumbers: 1 pound (2 medium) = 4 cups sliced
Eggplant: 1 pound = 4 cups chopped = 2 cups cooked
Garlic: 1 clove = 1 teaspoon chopped
Leeks: 1 pound = 4 cups chopped = 2 cups cooked
Mushrooms: 1 pound = 5 to 6 cups sliced = 2 cups cooked
Onions: 1 pound = 4 cups sliced = 2 cups cooked
Parsnips: 1 pound = 1½ cups cooked, puréed
Peas: 1 pound whole = 1 to 1½ cups shelled
Potatoes: 1 pound (3 medium) sliced = 2 cups mashed
Pumpkin: 1 pound = 4 cups chopped = 2 cups cooked and drained
Spinach: 1 pound = ¾ to 1 cup cooked
Squashes (summer): 1 pound = 4 cups grated = 2 cups sliced and cooked
Squashes (winter): 2 pounds = 2½ cups cooked, puréed
Sweet potatoes: 1 pound = 4 cups grated = 1 cup cooked, puréed
Swiss chard: 1 pound = 5 to 6 cups packed leaves = 1 to 1½ cups cooked
Tomatoes: 1 pound (3 or 4 medium) = 1½ cups seeded pulp
Turnips: 1 pound = 4 cups chopped = 2 cups cooked, mashed

Fruit

Apples: 1 pound (3 or 4 medium) = 3 cups sliced
Bananas: 1 pound (3 or 4 medium) = 1¾ cups mashed
Berries: 1 quart = 3½ cups
Dates: 1 pound = 2½ cups pitted
Lemon: 1 whole = 1 to 3 tablespoons juice; 1 to 1½ teaspoons grated rind
Lime: 1 whole = 1½ to 2 tablespoons juice
Orange: 1 medium = 6 to 8 tablespoons juice; 2 to 3 tablespoons grated rind
Peaches: 1 pound (4 medium) = 3 cups sliced
Pears: 1 pound (4 medium) = 2 cups sliced
Rhubarb: 1 pound = 2 cups cooked

Sowing Vegetable Seeds

Sow or plant in cool weather	Beets, broccoli, brussels sprouts, cabbage, lettuce, onions, parsley, peas, radishes, spinach, Swiss chard, turnips
Sow or plant in warm weather	Beans, carrots, corn, cucumbers, eggplant, melons, okra, peppers, squash, tomatoes
Sow or plant for one crop per season	Corn, eggplant, leeks, melons, peppers, potatoes, spinach (New Zealand), squash, tomatoes
Resow for additional crops	Beans, beets, cabbage, carrots, kohlrabi, lettuce, radishes, rutabagas, spinach, turnips

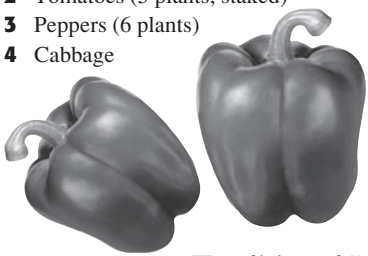
A Beginner's Vegetable Garden

■ A good size for a beginner's vegetable garden is 10x16 feet. It should have crops that are easy to grow. A plot this size, planted as suggested below, can feed a family of four for one summer, with a little extra for canning and freezing (or giving away).

Make 11 rows, 10 feet long, with 6 inches between them. Ideally, the rows should run north and south to take full advantage of the sunlight. Plant the following:

ROW

1 Zucchini (4 plants)
2 Tomatoes (5 plants, staked)
3 Peppers (6 plants)
4 Cabbage



ROW

5 Bush beans
6 Lettuce
7 Beets
8 Carrots
9 Chard
10 Radishes
11 Marigolds (to discourage rabbits!)

Traditional Planting Times

■ Plant **corn** when elm leaves are the size of a squirrel's ear, when oak leaves are the size of a mouse's ear, when apple blossoms begin to fall, or when the dogwoods are in full bloom.

■ Plant **lettuce, spinach, peas,** and other cool-weather vegetables when the lilacs show their first leaves or when daffodils begin to bloom.

■ Plant **tomatoes, early corn,** and **peppers** when dogwoods are in peak bloom or when daylilies start to bloom.

■ Plant **cucumbers** and **squashes** when lilac flowers fade.

■ Plant **perennials** when maple leaves begin to unfurl.

■ Plant **morning glories** when maple trees have full-size leaves.

■ Plant **pansies, snapdragons,** and other hardy annuals after the aspen and chokecherry trees leaf out.

■ Plant **beets** and **carrots** when dandelions are blooming.

When to . . .

	. . . FERTILIZE	. . . WATER
Beans	After heavy bloom and set of pods	Regularly, from start of pod to set
Beets	At time of planting	Only during drought conditions
Broccoli	3 weeks after transplanting	Only during drought conditions
Brussels sprouts	3 weeks after transplanting	At transplanting
Cabbage	3 weeks after transplanting	2 to 3 weeks before harvest
Carrots	In the fall for the following spring	Only during drought conditions
Cauliflower	3 weeks after transplanting	Once, 3 weeks before harvest
Celery	At time of transplanting	Once a week
Corn	When 8 to 10 inches tall, and when first silk appears	When tassels appear and cobs start to swell
Cucumbers	1 week after bloom, and 3 weeks later	Frequently, especially when fruits form
Lettuce	2 to 3 weeks after transplanting	Once a week
Melons	1 week after bloom, and again 3 weeks later	Once a week
Onion sets	When bulbs begin to swell, and when plants are 1 foot tall	Only during drought conditions
Parsnips	1 year before planting	Only during drought conditions
Peas	After heavy bloom and set of pods	Regularly, from start of pod to set
Peppers	After first fruit-set	Once a week
Potato tubers	At bloom time or time of second hilling	Regularly, when tubers start to form
Pumpkins	Just before vines start to run, when plants are about 1 foot tall	Only during drought conditions
Radishes	Before spring planting	Once a week
Spinach	When plants are one-third grown	Once a week
Squashes, summer	Just before vines start to run, when plants are about 1 foot tall	Only during drought conditions
Squashes, winter	Just before vines start to run, when plants are about 1 foot tall	Only during drought conditions
Tomatoes	2 weeks before, and after first picking	Twice a week

How to Grow Herbs

HERB	START SEEDS INDOORS	START SEEDS OUTDOORS* (weeks before last spring frost)	HEIGHT/SPREAD (inches)	SOIL	LIGHT**
Basil	6–8	Anytime after	12–24/12	Rich, moist	○
Borage	Not recommended	Anytime after	12–36/12	Rich, well-drained, dry	○
Chervil	Not recommended	3–4 before	12–24/8	Rich, moist	◑
Chives	8–10	3–4 before	12–18/18	Rich, moist	○
Cilantro/ coriander	Not recommended	Anytime after	12–36/6	Light	○◑
Dill	Not recommended	4–5 before	36–48/12	Rich	○
Fennel	4–6	Anytime after	48–80/18	Rich	○
Lavender, English	8–12	1–2 before	18–36/24	Moderately fertile, well-drained	○
Lavender, French	Not recommended	Not recommended	18–36/24	Moderately fertile, well-drained	○
Lemon balm	6–10	2–3 before	12–24/18	Rich, well-drained	○◑
Lovage	6–8	2–3 before	36–72/36	Fertile, sandy	○◑
Mint	Not recommended	Not recommended	12–24/18	Rich, moist	◑
Oregano	6–10	Anytime after	12–24/18	Poor	○
Parsley	10–12	3–4 before	18–24/6–8	Medium-rich	◑
Rosemary	8–10	Anytime after	48–72/48	Not too acid	○
Sage	6–10	1–2 before	12–48/30	Well-drained	○
Sorrel	6–10	2–3 after	20–48/12–14	Rich, organic	○
Summer savory	4–6	Anytime after	4–15/6	Medium rich	○
Sweet cicely	6–8	2–3 after	36–72/36	Moderately fertile, well-drained	○◑
Tarragon, French	Not recommended	Not recommended	24–36/12	Well-drained	○◑
Thyme, common	6–10	2–3 before	2–12/7–12	Fertile, well-drained	○◑

*Recommend minimum soil temperature of 70° to germinate

** ○ full sun ◑ partial shade

GROWTH TYPE
Annual
Annual, biennial
Annual, biennial
Perennial
Annual
Annual
Annual
Perennial
Tender perennial
Perennial
Perennial
Perennial
Tender perennial
Biennial
Tender perennial
Perennial
Perennial
Annual
Perennial
Perennial
Perennial

Drying Herbs

Before drying, remove any dead or diseased leaves or stems. Wash under cool water, shake off excess water, and put on a towel to dry completely. Air drying preserves an herb's essential oils; use for sturdy herbs. A microwave dries herbs more quickly, so mold is less likely to develop; use for moist, tender herbs.

- **Hanging Method:** Gather four to six stems of fresh herbs in a bunch and tie with string, leaving a loop for hanging. Or, use a rubber band with a paper clip attached to it. Hang the herbs in a warm, well-ventilated area, out of direct sunlight, until dry. For herbs that have full seed heads, such as dill or coriander, use a paper bag. Punch holes in the bag for ventilation, label it, and put the herb bunch into the bag before you tie a string around the top of the bag. The average drying time is 1 to 3 weeks.

- **Microwave Method:** This is better for small quantities, such as a cup or two at a time. Arrange a single layer of herbs between two paper towels and put them in the microwave for 1 to 2 minutes on high power. Let the leaves cool. If they are not dry, reheat for 30 seconds and check again. Repeat as needed. Let cool. Do not overcook, or the herbs will lose their flavor.

Storing Herbs and Spices

- **Fresh herbs:** Dill and parsley will keep for about 2 weeks with stems immersed in a glass of water tented with a plastic bag. Most other fresh herbs (and greens) will keep for short periods unwashed and refrigerated in tightly sealed plastic bags with just enough moisture to prevent wilting. For longer storage, use moisture- and gas-permeable paper and cellophane. Plastic cuts off oxygen to the plants and promotes spoilage.

- **Spices and dried herbs:** Store in a cool, dry place.

Cooking With Herbs

- **Bouquet garni** is usually made with bay leaves, thyme, and parsley tied with string or wrapped in cheesecloth. Use to flavor casseroles and soups. Remove after cooking.

- **Fines herbes** use equal amounts of fresh parsley, tarragon, chives, and chervil chopped fine. Commonly used in French cooking, they make a fine omelet or add zest to soups and sauces. Add to salads and butter sauces, or sprinkle on noodles, soups, and stews.

How to Grow Bulbs

	COMMON NAME	LATIN NAME	HARDINESS ZONE	SOIL	SUN/ SHADE*	SPACING (inches)
SPRING-PLANTED BULBS	Allium	*Allium*	3–10	Well-drained/moist	○	12
	Begonia, tuberous	*Begonia*	10–11	Well-drained/moist	◑●	12–15
	Blazing star/ gayfeather	*Liatris*	7–10	Well-drained	○	6
	Caladium	*Caladium*	10–11	Well-drained/moist	◑●	8–12
	Calla lily	*Zantedeschia*	8–10	Well-drained/moist	○◑	8–24
	Canna	*Canna*	8–11	Well-drained/moist	○	12–24
	Cyclamen	*Cyclamen*	7–9	Well-drained/moist	◑	4
	Dahlia	*Dahlia*	9–11	Well-drained/fertile	○	12–36
	Daylily	*Hemerocallis*	3–10	Adaptable to most soils	○◑	12–24
	Freesia	*Freesia*	9–11	Well-drained/moist/sandy	○◑	2–4
	Garden gloxinia	*Incarvillea*	4–8	Well-drained/moist	○	12
	Gladiolus	*Gladiolus*	4–11	Well-drained/fertile	○◑	4–9
	Iris	*Iris*	3–10	Well-drained/sandy	○	3–6
	Lily, Asiatic/Oriental	*Lilium*	3–8	Well-drained	○◑	8–12
	Peacock flower	*Tigridia*	8–10	Well-drained	○	5–6
	Shamrock/sorrel	*Oxalis*	5–9	Well-drained	○◑	4–6
	Windflower	*Anemone*	3–9	Well-drained/moist	○◑	3–6
FALL-PLANTED BULBS	Bluebell	*Hyacinthoides*	4–9	Well-drained/fertile	○◑	4
	Christmas rose/ hellebore	*Helleborus*	4–8	Neutral–alkaline	○◑	18
	Crocus	*Crocus*	3–8	Well-drained/moist/fertile	○◑	4
	Daffodil	*Narcissus*	3–10	Well-drained/moist/fertile	○◑	6
	Fritillary	*Fritillaria*	3–9	Well-drained/sandy	○◑	3
	Glory of the snow	*Chionodoxa*	3–9	Well-drained/moist	○◑	3
	Grape hyacinth	*Muscari*	4–10	Well-drained/moist/fertile	○◑	3–4
	Iris, bearded	*Iris*	3–9	Well-drained	○◑	4
	Iris, Siberian	*Iris*	4–9	Well-drained	○◑	4
	Ornamental onion	*Allium*	3–10	Well-drained/moist/fertile	○	12
	Snowdrop	*Galanthus*	3–9	Well-drained/moist/fertile	○◑	3
	Snowflake	*Leucojum*	5–9	Well-drained/moist/sandy	○◑	4
	Spring starflower	*Ipheion uniflorum*	6–9	Well-drained loam	○◑	3–6
	Star of Bethlehem	*Ornithogalum*	5–10	Well-drained/moist	○◑	2–5
	Striped squill	*Puschkinia scilloides*	3–9	Well-drained	○◑	6
	Tulip	*Tulipa*	4–8	Well-drained/fertile	○◑	3–6
	Winter aconite	*Eranthis*	4–9	Well-drained/moist/fertile	○◑	3

* ○ full sun ◑ partial shade ● full shade

DEPTH (inches)	BLOOMING SEASON	HEIGHT (inches)	NOTES
3–4	Spring to summer	6–60	Usually pest-free; a great cut flower
1–2	Summer to fall	8–18	North of Zone 10, lift in fall
4	Summer to fall	8–20	An excellent flower for drying; north of Zone 7, plant in spring, lift in fall
2	Summer	8–24	North of Zone 10, plant in spring, lift in fall
1–4	Summer	24–36	Fragrant; north of Zone 8, plant in spring, lift in fall
Level	Summer	18–60	North of Zone 8, plant in spring, lift in fall
1–2	Spring to fall	3–12	Naturalizes well in warm areas; north of Zone 7, lift in fall
4–6	Late summer	12–60	North of Zone 9, lift in fall
2	Summer	12–36	Mulch in winter in Zones 3 to 6
2	Summer	12–24	Fragrant; can be grown outdoors in warm climates
3–4	Summer	6–20	Does well in woodland settings
3–6	Early summer to early fall	12–80	North of Zone 10, lift in fall
4	Spring to late summer	3–72	Divide and replant rhizomes every two to five years
4–6	Early summer	36	Fragrant; self-sows; requires excellent drainage
4	Summer	18–24	North of Zone 8, lift in fall
2	Summer	2–12	Plant in confined area to control
2	Early summer	3–18	North of Zone 6, lift in fall
3–4	Spring	8–20	Excellent for borders, rock gardens and naturalizing
1–2	Spring	12	Hardy, but requires shelter from strong, cold winds
3	Early spring	5	Naturalizes well in grass
6	Early spring	14–24	Plant under shrubs or in a border
3	Midspring	6–30	Different species can be planted in rock gardens, woodland gardens, or borders
3	Spring	4–10	Self-sows easily; plant in rock gardens, raised beds, or under shrubs
2–3	Late winter to spring	6–12	Use as a border plant or in wildflower and rock gardens; self-sows easily
4	Early spring to early summer	3–48	Naturalizes well; good cut flower
4	Early spring to midsummer	18–48	An excellent cut flower
3–4	Late spring to early summer	6–60	Usually pest-free; a great cut flower
3	Spring	6–12	Best when clustered and planted in an area that will not dry out in summer
4	Spring	6–18	Naturalizes well
3	Spring	4–6	Fragrant; naturalizes easily
4	Spring to summer	6–24	North of Zone 5, plant in spring, lift in fall
3	Spring	4–6	Naturalizes easily; makes an attractive edging
4–6	Early to late spring	8–30	Excellent for borders, rock gardens, and naturalizing
2–3	Late winter to spring	2–4	Self-sows and naturalizes easily

Substitutions for Common Ingredients

ITEM	QUANTITY	SUBSTITUTION
Baking powder	1 teaspoon	¼ teaspoon baking soda plus ¼ teaspoon cornstarch plus ½ teaspoon cream of tartar
Buttermilk	1 cup	1 tablespoon lemon juice or vinegar plus milk to equal 1 cup; or 1 cup plain yogurt
Chocolate, unsweetened	1 ounce	3 tablespoons cocoa plus 1 tablespoon butter, shortening, or vegetable oil (dissolve the cocoa in the recipe's liquid)
Cracker crumbs	¾ cup	1 cup dry bread crumbs; or 1 tablespoon quick-cooking oats (for thickening)
Cream, heavy	1 cup	¾ cup milk plus ⅓ cup melted butter (this will not whip)
Cream, light	1 cup	⅞ cup milk plus 3 tablespoons melted, unsalted butter
Cream, sour	1 cup	⅞ cup buttermilk or plain yogurt plus 3 tablespoons melted, unsalted butter
Cream, whipping	1 cup	⅔ cup well-chilled evaporated milk, whipped; or 1 cup nonfat dry milk powder whipped with 1 cup ice water
Egg	1 whole	2 yolks plus 1 tablespoon cold water; or 3 tablespoons vegetable oil plus 1 tablespoon water (for baking); or 2 to 3 tablespoons mayonnaise (for cakes)
Egg white	1 white	2 teaspoons meringue powder plus 3 tablespoons water, combined
Flour, all-purpose	1 cup	1 cup plus 3 tablespoons cake flour (not advised for cookies or quick breads); or 1 cup self-rising flour (omit baking powder and salt from recipe); or 1¼ cups rye or coarsely ground whole grain flour; or 1 cup cornmeal
Flour, cake	1 cup	1 cup minus 3 tablespoons sifted all-purpose flour plus 3 tablespoons cornstarch
Flour, self-rising	1 cup	1 cup all-purpose flour plus 1½ teaspoons baking powder plus ½ teaspoon salt
Herbs, dried	1 teaspoon	1 tablespoon fresh, minced and packed
Honey	1 cup	1¼ cups sugar plus ½ cup liquid called for in recipe (such as water or oil)
Ketchup	1 cup	1 cup tomato sauce plus ¼ cup sugar plus 3 tablespoons apple-cider vinegar plus ½ teaspoon salt plus pinch of ground cloves combined; or 1 cup chili sauce
Lemon juice	1 teaspoon	½ teaspoon vinegar
Mayonnaise	1 cup	1 cup sour cream or plain yogurt; or 1 cup cottage cheese (puréed)
Milk, skim	1 cup	⅓ cup instant nonfat dry milk plus ¾ cup water

ITEM	QUANTITY	SUBSTITUTION
Milk, to sour	1 cup	1 tablespoon vinegar or lemon juice plus milk to equal 1 cup. Stir and let stand 5 minutes.
Milk, whole	1 cup	½ cup evaporated whole milk plus ½ cup water; or ¾ cup 2 percent milk plus ¼ cup half-and-half
Molasses	1 cup	1 cup honey or dark corn syrup
Mustard, dry	1 teaspoon	1 tablespoon prepared mustard less 1 teaspoon liquid from recipe
Oat bran	1 cup	1 cup wheat bran or rice bran or wheat germ
Oats, old-fashioned (rolled)	1 cup	1 cup steel-cut Irish or Scotch oats
Quinoa	1 cup	1 cup millet or couscous (whole wheat cooks faster) or bulgur
Sugar, dark-brown	1 cup	1 cup light-brown sugar, packed; or 1 cup granulated sugar plus 2 to 3 tablespoons molasses
Sugar, granulated	1 cup	1 cup firmly packed brown sugar; or 1¾ cups confectioners' sugar (makes baked goods less crisp); or 1 cup superfine sugar
Sugar, light-brown	1 cup	1 cup granulated sugar plus 1 to 2 tablespoons molasses; or ½ cup dark-brown sugar plus ½ cup granulated sugar
Sweetened condensed milk	1 can (14 oz.)	1 cup evaporated milk plus 1¼ cups granulated sugar. Combine and heat until sugar dissolves.
Vanilla bean	1-inch bean	1 teaspoon vanilla extract
Vinegar, apple-cider	—	malt, white-wine, or rice vinegar
Vinegar, balsamic	1 tablespoon	1 tablespoon red- or white-wine vinegar plus ½ teaspoon sugar
Vinegar, red-wine	—	white-wine, sherry, champagne, or balsamic vinegar
Vinegar, rice	—	apple-cider, champagne, or white-wine vinegar
Vinegar, white-wine	—	champagne, fruit (raspberry), rice, or red-wine vinegar
Yeast	1 cake (⅗ oz.)	1 package or 1 scant tablespoon active dried yeast
Yogurt, plain	1 cup	1 cup sour cream (thicker; less tart) or buttermilk (thinner; use in baking, dressings, sauces)

Types of Fat

■ One way to minimize your total blood cholesterol is to manage the amount and types of fat in your diet. Aim for monounsaturated and polyunsaturated fats; avoid saturated and trans fats.

■ **Monounsaturated fat** lowers LDL (bad cholesterol) and may raise HDL (good cholesterol) or leave it unchanged. Found in almonds, avocados, canola oil, cashews, olive oil, peanut oil, and peanuts.

■ **Polyunsaturated fat** lowers LDL and may lower HDL. Includes omega-3 and omega-6 fatty acids. Found in corn oil, cottonseed oil, fish such as salmon and tuna, safflower oil, sesame seeds, soybeans, and sunflower oil.

■ **Saturated fat** raises both LDL and HDL. Found in chocolate, cocoa butter, coconut oil, dairy products (milk, butter, cheese, ice cream), egg yolks, palm oil, and red meat.

■ **Trans fat** raises LDL and lowers HDL. A type of fat common in many processed foods, such as most margarines (especially stick), vegetable shortening, partially hydrogenated vegetable oil, many commercial fried foods (doughnuts, french fries), and commercial baked goods (cookies, crackers, cakes).

Calorie-Burning Comparisons

■ If you hustle through your chores to get to the fitness center, relax. You're getting a great workout already. The left-hand column lists "chore" exercises, the middle column shows the number of calories burned per minute per pound of body weight, and the right-hand column lists comparable "recreational" exercises. For example, a 150-pound person forking straw bales burns 9.45 calories per minute, the same workout he or she would get playing basketball.

Chopping with an ax, fast	**0.135**	Skiing, cross country, uphill
Climbing hills, with 44-pound load	**0.066**	Swimming, crawl, fast
Digging trenches	**0.065**	Skiing, cross country, steady walk
Forking straw bales	**0.063**	Basketball
Chopping down trees	**0.060**	Football
Climbing hills, with 9-pound load	**0.058**	Swimming, crawl, slow
Sawing by hand	**0.055**	Skiing, cross country, moderate
Mowing lawns	**0.051**	Horseback riding, trotting
Scrubbing floors	**0.049**	Tennis
Shoveling coal	**0.049**	Aerobic dance, medium
Hoeing	**0.041**	Weight training, circuit training
Stacking firewood	**0.040**	Weight lifting, free weights
Shoveling grain	**0.038**	Golf
Painting houses	**0.035**	Walking, normal pace, asphalt road
Weeding	**0.033**	Table tennis
Shopping for food	**0.028**	Cycling, 5.5 mph
Mopping floors	**0.028**	Fishing
Washing windows	**0.026**	Croquet
Raking	**0.025**	Dancing, ballroom
Driving a tractor	**0.016**	Drawing, standing position

Freezer Storage Time

(freezer temperature 0°F or colder)

Product	Months in Freezer
Fresh meat	
Beef	6 to 12
Lamb	6 to 9
Veal	6 to 9
Pork	4 to 6
Ground beef, veal, lamb, pork	3 to 4
Frankfurters	1 to 2
Sausage, fresh pork	1 to 2
Ready-to-serve luncheon meats	Not recommended
Poultry	
Chicken or turkey (whole)	12
Chicken or turkey (parts), Rock Cornish game hens, game birds	6 to 9
Duck, cooked poultry (in gravy), chicken, turkey	4
Goose, squab	4 to 6
Cooked poultry (breaded, fried)	4
Giblets	3 to 4
Cooked poultry (plain meat)	4
Fresh fruits (prepared for freezing)	
All fruits except those listed below	10 to 12
Avocados, bananas	3
Lemons, limes, plantains	4 to 6
Fresh vegetables (prepared for freezing)	
Beans, beets, bok choy, broccoli, brussels sprouts, cabbage, carrots, cauliflower, celery, corn, greens, kohlrabi, leeks, mushrooms, okra, onions, peas, peppers, soybeans, spinach, summer squashes	10 to 12
Asparagus, rutabagas, turnips	8 to 10
Artichokes, eggplant	6 to 8
Tomatoes (overripe or sliced)	2
Bamboo shoots, cucumbers, endive, lettuce, radishes, watercress	Not recommended
Cheese (except those listed below)	6
Cottage cheese, cream cheese, feta, goat, fresh mozzarella, Neufchâtel, Parmesan, processed cheese (opened)	Not recommended

Product	Months in Freezer
Dairy products	
Margarine (not diet)	12
Butter	6 to 9
Cream, half-and-half	4
Milk	3
Ice cream	1 to 2
Yogurt	1 to 2

Freezing Hints

For meals, remember that a quart container holds four servings, and a pint container holds two servings.

To prevent sticking, spread the food to be frozen (berries, hamburgers, cookies, etc.) on a cookie sheet and freeze until solid. Then place in plastic bags and freeze.

Label foods for easy identification. Write the name of the food, number of servings, and date of freezing on containers or bags.

Freeze foods as quickly as possible by placing them directly against the sides of the freezer.

Arrange freezer into sections for each food category.

If power is interrupted, or if the freezer is not operating normally, do not open the freezer door. Food in a loaded freezer will usually stay frozen for 2 days if the freezer door remains closed during that time period.

Plastics

■ In your quest to go green, use this guide to use and sort plastic. The number, usually found with a triangle symbol on a container, indicates the type of resin used to produce the plastic. Call **1-800-CLEANUP** for recycling information in your state.

Number 1 • *PETE or PET (polyethylene terephthalate)*

IS USED IN . . . . . microwavable food trays; salad dressing, soft drink, water, and juice bottles
STATUS . . . . . hard to clean; absorbs bacteria and flavors; avoid reusing
IS RECYCLED TO MAKE . . carpet, furniture, new containers, Polar fleece

Number 2 • *HDPE (high-density polyethylene)*

IS USED IN . . . . . household cleaner and shampoo bottles, milk jugs, yogurt tubs
STATUS . . . . . transmits no known chemicals into food
IS RECYCLED TO MAKE . . detergent bottles, fencing, floor tiles, pens

Number 3 • *V or PVC (vinyl)*

IS USED IN . . . . . cooking oil bottles, clear food packaging, mouthwash bottles
STATUS . . . . . is believed to contain phalates that interfere with hormonal development; avoid
IS RECYCLED TO MAKE . . cables, mudflaps, paneling, roadway gutters

Number 4 • *LDPE (low-density polyethylene)*

IS USED IN . . . . . bread and shopping bags, carpet, clothing, furniture
STATUS . . . . . transmits no known chemicals into food
IS RECYCLED TO MAKE . . envelopes, floor tiles, lumber, trash-can liners

Number 5 • *PP (polypropylene)*

IS USED IN . . . . . ketchup bottles, medicine and syrup bottles, drinking straws
STATUS . . . . . transmits no known chemicals into food
IS RECYCLED TO MAKE . . battery cables, brooms, ice scrapers, rakes

Number 6 • *PS (polystyrene)*

IS USED IN . . . . . disposable cups and plates, egg cartons, take-out containers
STATUS . . . . . is believed to leach styrene, a possible human carcinogen, into food; avoid
IS RECYCLED TO MAKE . . foam packaging, insulation, light switchplates, rulers

Number 7 • *Other (miscellaneous)*

IS USED IN . . . . . 3- and 5-gallon water jugs, nylon, some food containers
STATUS . . . . . contains bisphenol A, which has been linked to heart disease and obesity; avoid
IS RECYCLED TO MAKE . . custom-made products

Heat Values

Firewood

High Heat Value

1 cord = 200–250 gallons of fuel oil

American beech
Apple
Ironwood
Red oak
Shagbark hickory
Sugar maple
White ash
White oak
Yellow birch

Medium Heat Value

1 cord = 150–200 gallons of fuel oil

American elm
Black cherry
Douglas fir
Red maple
Silver maple
Tamarack
White birch

Low Heat Value

1 cord = 100–150 gallons of fuel oil

Aspen
Cottonwood
Hemlock
Lodgepole pine
Red alder
Redwood
Sitka spruce
Western red cedar
White pine

Fuels

Fuel	BTU (approx.)	Unit of Measure
Oil	141,000	Gallon
Coal	31,000	Pound
Natural gas	1,000	Cubic foot
Steam	1,000	Cubic foot
Electricity	3,413	Kilowatt-hour
Gasoline	124,000	Gallon

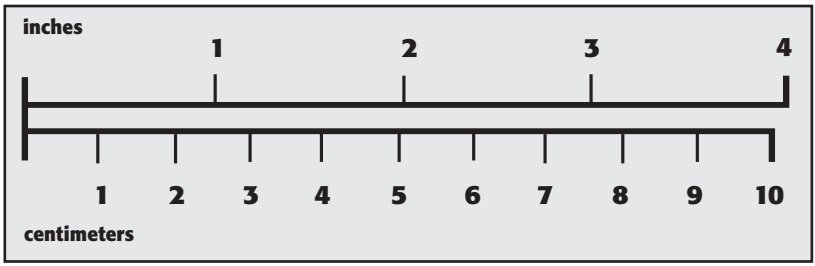
How Many Trees in a Cord of Wood?

DIAMETER OF TREE (4½' ABOVE GROUND)	NUMBER OF TREES (PER CORD)
4"	50
6"	20
8"	10
10"	6
12"	4
14"	3

A Few Clues About Cords of Wood

- A cord of wood is a pile of logs 4 feet wide by 4 feet high by 8 feet long.
- A cord of wood may contain from 77 to 96 cubic feet of wood.
- The larger the unsplit logs, the larger the gaps, with fewer cubic feet of wood actually in the cord.
- A cord of air-dried, dense hardwood weighs about 2 tons (4,000 pounds).
- From one cord of firewood, you could make 7,500,000 toothpicks, 460,000 personal checks, 30 Boston rockers, or 12 dining room tables with each table seating eight.

Metric Conversion

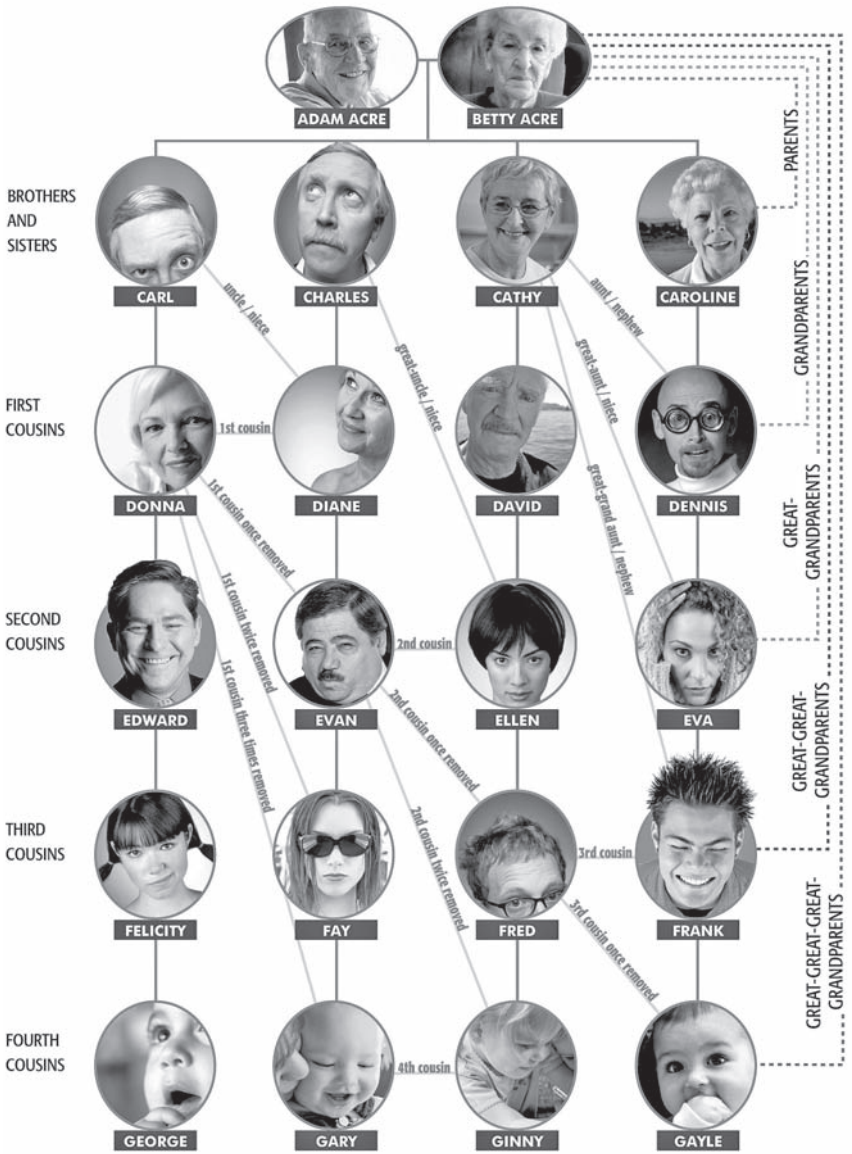


U.S. measure	x this number	= metric equivalent	metric measure	x this number	= U.S. equivalent
inch	2.54	centimeter	0.39		inch
foot	30.48	centimeter	0.033		foot
yard	0.91	meter	1.09		yard
mile	1.61	kilometer	0.62		mile
square inch	6.45	square centimeter	0.15		square inch
square foot	0.09	square meter	10.76		square foot
square yard	0.8	square meter	1.2		square yard
square mile	0.84	square kilometer	0.39		square mile
acre	0.4	hectare	2.47		acre
ounce	28.0	gram	0.035		ounce
pound	0.45	kilogram	2.2		pound
short ton (2,000 pounds)	0.91	metric ton	1.10		short ton
ounce	30.0	milliliter	0.034		ounce
pint	0.47	liter	2.1		pint
quart	0.95	liter	1.06		quart
gallon	3.8	liter	0.26		gallon

■ If you know the U.S. measurement and want to convert it to metric, multiply it by the number in the left shaded column (example: 1 inch equals 2.54 centimeters). If you know the metric measurement, multiply it by the number in the right shaded column (example: 2 meters equals 2.18 yards).

Where Do You Fit in Your Family Tree?

■ Technically it's known as consanguinity; that is, the quality or state of being related by blood or descended from a common ancestor. These relationships are shown below for the genealogy of six generations of one family.



The Golden Rule

(It's true in all faiths.)

Brahmanism:
This is the sum of duty: Do naught unto others which would cause you pain if done to you.
Mahabharata 5:1517

Buddhism:
Hurt not others in ways that you yourself would find hurtful.
Udana-Varga 5:18

Christianity:
All things whatsoever ye would that men should do to you, do ye even so to them; for this is the law and the prophets.
Matthew 7:12

Confucianism:
Surely it is the maxim of loving-kindness: Do not unto others what you would not have them do unto you.
Analects 15:23

Islam:
No one of you is a believer until he desires for his brother that which he desires for himself.
Sunnah

Judaism:
What is hateful to you, do not to your fellowman. That is the entire Law; all the rest is commentary.
Talmud, Shabbat 31a

Taoism:
Regard your neighbor's gain as your own gain and your neighbor's loss as your own loss.
T'ai Shang Kan Ying P'ien

Zoroastrianism:
That nature alone is good which refrains from doing unto another whatsoever is not good for itself.
Dadistan-i-dinik 94:5

–courtesy Elizabeth Pool

Famous Last Words

- **Waiting, are they? Waiting, are they? Well—let 'em wait.**
(To an attending doctor who attempted to comfort him by saying, "General, I fear the angels are waiting for you.")
–Ethan Allen, American Revolutionary general, d. February 12, 1789

- **A dying man can do nothing easy.**
–Benjamin Franklin, American statesman, d. April 17, 1790

- **Now I shall go to sleep. Good night.**
–Lord George Byron, English writer, d. April 19, 1824

- **Is it the Fourth?**
–Thomas Jefferson, 3rd U.S. president, d. July 4, 1826

- **Thomas Jefferson—still survives . . .**
(Actually, Jefferson had died earlier that same day.)
–John Adams, 2nd U.S. president, d. July 4, 1826

- **Friends, applaud. The comedy is finished.**
–Ludwig van Beethoven, German-Austrian composer, d. March 26, 1827

- **Moose . . . Indian . . .**
–Henry David Thoreau, American writer, d. May 6, 1862

- **Go on, get out—last words are for fools who haven't said enough.**
(To his housekeeper, who urged him to tell her his last words so she could write them down for posterity.)
–Karl Marx, German political philosopher, d. March 14, 1883

- **Is it not meningitis?**
–Louisa M. Alcott, American writer, d. March 6, 1888

- **How were the receipts today at Madison Square Garden?**
–P. T. Barnum, American entrepreneur, d. April 7, 1891

- **Turn up the lights, I don't want to go home in the dark.**
–O. Henry (William Sidney Porter), American writer, d. June 4, 1910

- **Get my swan costume ready.**
–Anna Pavlova, Russian ballerina, d. January 23, 1931

- **Is everybody happy? I want everybody to be happy. I know I'm happy.**
–Ethel Barrymore, American actress, d. June 18, 1959

- **I'm bored with it all.**
(Before slipping into a coma. He died nine days later.)
–Winston Churchill, English statesman, d. January 24, 1965

- **You be good. You'll be in tomorrow. I love you.**
–Alex, highly intelligent African Gray parrot, d. September 6, 2007