

## TRADITIONAL MEASUREMENT

Mongolians pay attention to all measurements in detail. There is a saying that one must measure seven times but cut once.

### The measurement of time

Mongolian terms	Present name	Number
Jaran (60 cycle)	Year	60
Jil (twelve months, year)	month (days)	365-366
Uliral (seasen)	month (days)	90-91
Sar (month)	days	30
Doloo khonog (week)	days	7
Khonog (night)	time	12
Tsag	time	2
Möch	minute	24
Khuvi	minute	1
Amisgal	second	4

The maximum of the time for Mongolians is the jaran or epoch. The next is the year (identified by the mouse, ox, tiger, rabbit, dragon, snake, horse, sheep, ape, hen, dog and boar). The smallest measurement of the time of Mongolians is the breath. In our ancient calendar, the division of 24 particles or 60 chinlüür is important; each is divided into 6 breathes; the breath is divided into 707 dense; the measurement of time is divided and subdivided into very small

units. There are also approximations of time. The calculation of the time of day or night is connected with the motions of the constellations.

We divide the day into dawn, sun rising, lunch, afternoon, sun setting, dusk or twilight, appearance of the constellation Orion, and the appearance of Ursa Major's slanting. These moments mark times to make tea, to have a tea, to fill a tobacco tin, to take a nap, and to give a hint.

### Metric unit of capacity

Names	Approximate measurement (litre)
Ing	207.9 litre
Achaa	103.54 litre
Khuu	51.77 litre
Suulga	10.35 litre
Shin	1.039 litre
Bitüü	0.1 litre
Khuvi	0.01 litre

The maximum unit of capacity is the in (broad gauge). The minimum unit of capacity is the *khuvi* (narrowest-gauge). These measurements are out-dated nowadays. But in ancient times, our Mongolians used various measurement devices, such as vessels, including a mare's or cow's milk-skin, a pot, pail, kettle, tankard, ladle, cup, bowl, or spoon; fractional measurements were made with sacks, pots, cups, ladles, handfuls and pinch; measurements of length, width and height included the fathom, cubit and finger-span. Even today, we Mongolians commonly use such terms as Mountain-sized, ox-sized, or sheep-sized.

## Weight

There were the following weightings:

Name	Approximate number
Sii	0.37 mg
Khuu	3.37 mg
Lii	37.30 mg
Phun	0.37 g
Tsen	3.73 g
Lan	37.30 g
Jin	596.81 g

There was a weight designated as *püü* which was equal to 16.3 kilograms. *Tsen, lan, jin, and püü* are used seldom today. A steel-yard (*dens*) was a lever with a short arm for weighted things and a long graduated arm on which a single weight moves. Balance consists of a beam and pans or scales. Mongolians used two types of scales for trade and life. Between the tenth and thirteenth centuries, steel-yards were used for weighing silver, coin, precious metal, while hand-balance was used for weighing other things. When the ancient capital city of Karakorum was excavated, there are certain archaeological findings, including the find of the smallest weight of the balance, 445 gram. The biggest weight of the balance they found is 2,600 gram. There is a big difference between weights. This means that measuring was more accurate than today. These weights were cast in the smelting-works which had existed in the vicinity of the ancient Karakorum.



Traditional measuring instruments

## Length measurement

Once the following measurements were used:

Name	Approximate length
Sii	0.003 mm
Khuu	0.032 mm
Lii	0.32 mm
Phun	3.2 mm
Jamkh	3.2 cm

Name	Approximate length
Cubit	40 cm
Palm	32 cm
Fathom	160 cm
Double fathom	3.2 m
Khuvi	57.6 m
Gazar	576 m

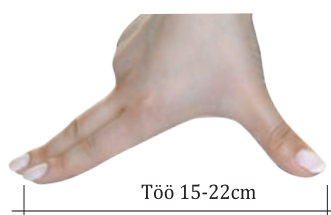
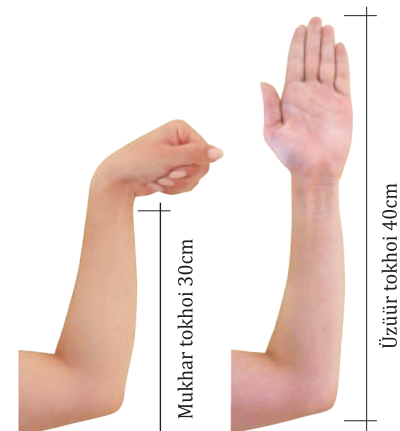
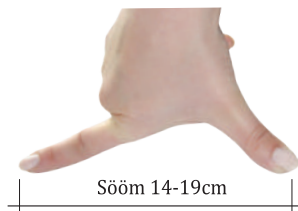
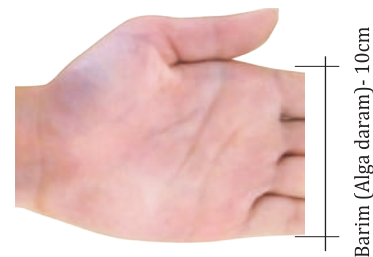
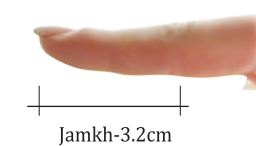
There are measurements of *khuruu* or finger-distance, across the width one finger (2 cm), *barim*-distance across four fingers (10 cm), *sööm*-distance between the tips of the outstretched index finger and the thumb (14-19 cm), *töö*-distance from the end of the thumb to the end of the middle finger when fingers are extended. *Töö* (Mongolian span) is /15-22 cm/.

There are also measurements by foot. *Alkham* (step) is 80-160 cm. *Altsam* (stride) is 160-176 cm. There are also measurements by pasture distances of animals.

Name	Approximate distance
Sheep-pasture	1-2 km
Cattle- pasture	2-2.5 km
Calve-pasture	1 km
Lamb-pasture	0.5-1 km
Horse-pasture	4-5 km
Day's distance	90 km
Day and night distance (distance to spend the night)	120-130 km

A *ödriin gazar* (day's distance) means a destination that is reached by riding camel or horse during one day. *Khonogin gazar* (day and night distance) means a destination which to be passed a night. We also say *jilijn gazar* (year distance). This is destination to reach by riding within a year. *Nüüdliin gazar* (distance moving to another place) is a destination to reach by moving. *Saakhaltiin gazar* (distance to reach the neighbouring village) is 1-2 km. *Khol saakhalt* is 3-5 km (two ger villagers able to see each other). *Kharaa khürekh gazar* is the distance a herder can see, about 5 km; *mod gazar* is 1.06 km, *beer gazar* is 7.4 km, *örtöö gazar* is 30 km. 3 metres is called *jan* and 0.32 metre is called *chii*.

Mongolians also measure the distance by speed, such as a distance of shooting arrow, *atlag* (place out of 11-12 fathoms), *khom* (7 fathoms) a distance to sprinkle grains or to split a stone. We also gauge the depth of water by horse or camel, which is able to disappear or water is able to spread over the back of a horse, water is reachable the stirrups. We also gauge the depth of snow by horse's belly; we say the snow is able to clog the knees of horse or fetlock-sized snow; herd's hoof-sized snow or hare-foot-sized or bird-foot-sized snow. There were many measurements if you look up the old books. For example a size is like top of hair or like barley-sized.





## Area measurement

If we put our traditional area measurement into metric system:

Mongolian names	Unit	Approximate size
Khaash khaashaa örtöö	1 km	900 km <sup>2</sup>
Khaash khaashaa saakhalt	1 km	0.64 km <sup>2</sup>
Nomadic villagers in vicinity	1 m	2000 m <sup>2</sup>
Geriin buiriin chinee	1 m	20 mm <sup>2</sup>
Khaash khaashaa ald	1 m	2.6-2.8 m <sup>2</sup>
Khaash khaashaa alkham	1 m	0.64 m <sup>2</sup>
Khaash khaashaa tohoi	1 cm	1600 cm <sup>2</sup>
Khaash khaashaa töö	1 cm	400 cm <sup>2</sup>
Khaash khaashaa sööm	1 cm	320 cm <sup>2</sup>
Khaash khaashaa jamkh	1 cm	10.24 cm <sup>2</sup>

The following names for the area measurement were used as well:

Mongolian names	Unit	Approximate size
Khuvaari	hectare	92160.9 hectare
Ür	hectare	0.9 hectare

We, Mongolians, say a *khaash khaashaa* area is partial; *khaash khaashaa* means square. *Urt* means length, *örgön* means broad; *örtöö* is relay, *saakhalt* is vicinity. *Ald* is fathom, *alkham* is step or pace.

*Töö* is span, *khuruu* is one joint. We also speak about measuring as sheep-lairage-sized, *ger*-site sized, crown-covering

sized, saddle cloth-sized, palm-sized, nail-sized, just like nail or just like lunula, as well as just like the point of needle. We enclose a cloth in fold and cut it along the folding. It is called "am or square". When the square-cloth is subdivided into triangle, then we say triangled brocade or triangled silk.