

Fundamentals of Mathematical Knowledge in the Traditional Culture of Evenks

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Abstract

This article is devoted to an analysis of the main mathematical concepts of one of the indigenous peoples of the North: Evenks. This is the first attempt at the systematisation and understanding of Evenks' accumulated stock of mathematical knowledge. The study has shown that the total mathematical knowledge of this group underlies the sociocultural environment and traditional way of life. The main function of mathematical concepts is to give information about the number of animals in the camp, and to specify the direction of movement during hunting. In addition, it is noted that mathematical representation is closely interrelated with the general knowledge about the world. The selection of separate groups of numerals allows the author to specify the area in which they are used. Common geometric representation is reflected in the applied art.

Key words: evenks, ethnomathematics, folk traditions, folk education, North culture

Introduction

The idea that mathematics belongs to the cultural sphere finds its confirmation in the studies of modern researchers, in which they reveal and study the peculiarities of mathematics in different ethnic groups. Nowadays, papers of this kind are united into one group of investigations, named 'ethnomathematics'. This term appeared in the second half of the previous century for the first time in the works of the Brazilian mathematician D'Ambrosio, who used it in different, but sufficiently close meanings: as a complex of mathematical practices in different cultures (national-tribal, professional, age-related and. etc); as a specific instrument of coding, permitting the members of this or that cultural group not only to describe, but also to comprehend the reality and to control it; as a certain system of styles, techniques, methods, forming in this or that culture, directed to the comprehension, explanation and (if necessary) to the change of the natural and social environment (Evstrop'eva, 2013).

In recent years, D'Ambrosio (Rosa et al., 2017) and many other scientists, based upon the concepts of ethnomathematics, have developed it as an exploration programme in the fields of philosophy, epistemology and the history of mathematics (and, more broadly, natural science). They pay attention to its practical ways in education, particularly for teaching and instruction in schools and universities.

The study of the elementary mathematical ideas of the native people of the North, where the social-cultural environment and the ethnos exerted the essential influence on the forming of the mathematical knowledge, is of great interest. Of particular significance are the investigations of the Evenk culture. The Evenks are the indigenous people of the Russian Federation. They inhabit the extensive territory from the left bank of the Yenisey in the west to the Sea of Okhotsk in the east. The southern settlement boundary runs along the left bank of the Amur and the Angara. According to the administrative division, the Evenks settled within the boundaries of Irkutsk, Amur, Sakhalin regions, Republics of Yakutiya and Buryatiya, Krasnoyarsk, the Trans-Baikal and Khabarovks territories. The Evenks also live in Tomsk and Tyumen' regions. They have never constituted the majority population on this vast territory. They live in the same settlements with the Russians, Yakuts, Buryats and other nations. They also live in Mongolia and in the north-east of China.

The Evenks are an ancient indigenous people of Eastern Siberia, including the Baikal region. Scientists consider the uniqueness of this nation to be in its extensive settlement in small groups on the huge territory of the Eastern Siberia and Far East. The centuries-old development in the huge icy area caused not only the original way of life, but the accumulation of the definite practical knowledge specific for this nation, which was improved during the process of its transference from one generation to another. The Evenks developed the ideas about the directions of the cardinal points and the original calendar; the count system and the ability to operate with numbers were developed; they developed in detail the practically necessary small measures of length. The long way of experience and observation helped them to master unconsciously some laws of motion (for instance, about bows and crossbows) and the material properties (for instance, of spruce, birch, burl and others), which they used for various handcrafted items.

Formation of numeric signs

During the development of the taiga wilds, the Evenks developed their own system of signs and pictures, which allowed them to communicate with each other. Middendorf encountered among the upper Amur Evenks and in taiga too the pictures of horses and deer's heads and the sign on the trees' slices which offered to look for the escaped horse or deer. A sample of this pictorial writing is kept in the State Museum of Ethnography of the People of Russia (coll. № 1763 – 5). Most

often, the different placement of arrows, branches and moss served as signs: the moss placed near the trunk on the knot (*legdeke*); the abatis (*samelki*); curved or slightly undercut branches (*sugisikta*); the picture on the trim place or on the birch bark, hung on the bough (*onevyn*) and the picture on the ground near the wood base (*onyvyn*). For instance, a branch thrust obliquely into the abates with its top upwards meant that the hunters went far away; sometimes they made notches on the branch according to the quantity of rivers over the distance they migrated; a notched branch horizontally thrust into the abates was the sign that in the direction of the top over the distance of as many as rivers there is a camp of nomads; the branch with the curved and strengthened top and with the marks, horizontally thrust into the abates meant that there was the definite quantity (according to the quantity of marks) of raw-hide tents. Some moss, placed on the branch stub, to which the branch was accreted, symbolised the killed animal (Tishkovet al., 2015). And the 'arrow' of the branch indicated the direction where the kill was. The log lying across two wood stripes of the raw-hide tent at the entrance meant the interdiction to use the raw-hide tent (or its carcass). The Evenks used special signs (ideograms). Thus, there were the special signs for river, mountains, expectant women, migrating, hungry trade life, satisfied trade life (in the first case, with the edge of the knife up; in the second case, with the edge of the knife down).

It was mentioned in the first work in the history of Russia devoted to grammatology (the science of writing systems, Kondratova's 'Book about letter' (1975). The author writes that the Evenks used special signs for counting: the vertical line meant one, while a cross indicated ten; usually for counting they used a wooden block. The special signs for numbers (the numbers are classical samples of ideogram, which can be read in any language in its own way), existed in the nations of Mansi and Khanty, living to the west from of the Evenks, in the region of the Ob North. For instance, Kazymskiy Kants have a 'cross' (like the Evenks do) denoting ten, a 'star' denoted a hundred, the 'ellipse with the cross in it' denoted five hundred, a 'circle with the cross in it' – a thousand (Podmaskin, 2008).

Karasev wrote in 'Grammatological dictionary' that even non-literate people had numerical characters or mnemonic symbols for writing: labels, lines and cuts, among early Slavs. According to the author, Evenks, Khantys, and Mansis denoted ten as a cross, one hundred as a star, and five hundred as an ellipse with a cross in the middle (Vampilova et al., 2013).

Thus, the conclusion can be preliminary made that the Evenks had their own group of numerical characters.

Numbers in traditional culture of Evenks

Numbers have a distinct importance in the Evenk culture; like many other nations of the world, they had their own notions about the numbers, in which their unique culture was reflected. In their religious faiths, they worshipped some

numbers. The Evenks conceived of three worlds: the upper, the middle, and the lower. The situation during the shamanistic rituals in the Western (to the West from the line of Lena-Baikal) and Eastern (Baikal-Amur) Evenks was different. Number seven and its divisibles predominated in the Western Evenks; number nine predominated in the sacred groves of the Eastern Evenks. Extremely interesting is the description by Anisimova of the clothes of the future daughter-in-law in the Olenekskiy Evenks, whence it follows that the Evenks realized that the odd numbers “chorbohtookh byolar” (may be with excess). Thus, ‘daughter[s]-in-law should wear the dresses in three layers. The bottom of the overdress should be served round with the fur skins. It was required from the future daughter-in-law the odd number of the fur coats -7-9, the odd number of deer -117 or 201’. The Evenks called the odd number **kelteme**.

Ibrahimov asserts that all the world religions pay special attention to the mystic-philosophical comprehension of the number category, to the identification of its role in people’s life, to the grounding of religion basis with the help of number category. For example, the author refers to the Pythagoreans and Eleatics, forming the system of their philosophy on the sacralization of the number category and confirming that ‘the world is in control of numbers’; the ancient Egyptians, Yahudis, Chinese, in whose mythology and religions the number category always played the essential and sometimes the extraordinary role. Ibrahimov considers interesting the fact that in spite of all the differences in culture, language, life experience, practically all the nations populating our planet, as the fundamentals are the same numbers, mainly short, at that even their magical status sometimes coincides. For example, the most significant numbers with their variations are the numbers one, three, five, seven, and nine.

In that context we shall introduce the numbers from one to ten in Evenk culture and folklore:

1. –*umun, umuken* ‘one’ – a man has one life, there is a proverb: *umun umukta sin umun* (liter. ‘One egg is nothing’), meaning that man has only one life; *umun umukta idu-de neni budyn sin umun* (liter. ‘One egg, wherever it falls, death is the only’); in the Evenk folklore there is a one-eyed supranatural ferrous monster, with the one weakness – its eye.

2. –*dyr* ‘two’ – two boys and two girls took part in the shamanistic ritual ‘acquisition of the childish souls’. The shaman in his singing described his march to the souls’ world. The souls in the kind of birds flew from one branch to another. The shaman, creeping up, started playing with the birds, unnoticeably hid one of them and quickly descended to the ground. At that moment children were standing near the shaman in the raw-hide-tent and keeping the white kerchief in their hands, at which they put the souls-strands of fur. In folklore two is a pair, a couple, body parts: hands, legs, eyes, ears etc. ‘Two bears pull the rope from each other, but can neither take away, nor outbalance’ (potakyi – the onerary bag on the deer),

'Two deer stay nearby, remove their clothes for winter and in spring they again grow up' (antlers).

3. *ilan* 'three' – the souls' feeding happened three times, any stamping ground was passed round three times. In the legends about the bogatyrs Irany, Umsulikene and Magikdun, the heroes marry to the three daughters of the Sun; at the ceremony of bear's head eating, the vessel with the dish detoured on the circle three times and the repast finished; during the divination shaman threw the beater three times towards the querent, observing the way it fell down.

4. *dyrin* "four" – the four directions of cardinal points; there is the written presentation about four "grounds" among the Ilimpiyskiy shamans – the worlds in the form of the square planes situated one above another; the shaman put the picture of the ancestor on the sacrificial deer's back, then passed the deer round the raw-hide tent four times, made a fire and put four columns around it – *tegeldyn*.

5. *Tuna* "five" – there are five fingers and five toes. The Evenks know the fairy tale "*Heladan*", about an old man and his five daughters, whose names correspond to the names of five fingers.

6. *Nunyn* "six" – *Nungurdok* – the name was derived from the number six. This name is often met in the Evenks's legends. The hero with alike name has six plaits.

7. *Nadan* "seven" – everyone should know the seven generations of their ancestries. The special maternity dwelling for women, the hut – in summer and raw-hide tent in winter, should have had seven poles (three of which are main); there is a phraseological phrase "Umbilical cord of the country is the Seven seas" (*nadan buldar chulurun*), denoting the foremost in this country; so as to recover and become the greatest narratress of folk tales of the Nymngakanes, K.P. Afanasyeva, when a child, at the instance of the shaman Vasiliy Fedotov, should have been singing during seven days; besides, the number seven often occurs in the Evenks folklore: the seven Udagankas, the seven thousand people; the seven ravines of the Upper Mayan (the Upper Mayan is the layer of the sky, where the Divinity Mayan lives), the seven ravines Yuri Yulten (Yuri Yulten – the land of the Rising Sun), the name of the hero Nadan nadarmachan Sekakindiya – Semizhdy braided Sekakindya (verbatim, having seven parallel tressed braids; Serezhka (from sekan – earring)). The Evenks birars called the Galaxy Constellation as Nadan unil (seven maidens) (Dyachkovskaya, 2014).

8. *Daypkun* "eight". The ritual *ikenipke* in the Symsk group of the Evenks, surviving to the XXth century, presented the ancient eight-day hunting mystery-chase for the divine poroz (deer), its killing and inclusion to its meat. There is a mention about the octal dwelling in the folklore of the Evenks – *chorama* with the exit through the smoke flap. The memorials about the *chorama* dwelling were kept in the beginning of the XXth century among the urmiysko-amguno-chumikanskiy Evenks. The word *chora* names the pole of the cylindrical part of the raw-hide

tent's carcass like the Chukot yaranga. According to the reports of the Amgun Evenks, the raw-hide tent – *dykcha* earlier was named *chorama*. Now this term is forgotten and is kept only in legends; in the folklore of the eastern Evenks "Narration about Chinanay's Son" there is a mention about Dyapkalta – an old man, having eight heads.

9. *Egin* "nine" - some shamanistic rituals were carried out nine times. The upper shamanistic world (*tymanitki*) located above nine (seven) clouds of the sky over the origin *endekit*: below the ninth (fourth) level (the low world) only the very strong shamans went; the middle-Aldan Evenks during the hunting kept the tradition of division of the bagged animals head into nine parts.

10. *Dayn* "ten". It is narrated about the ten-legged deer in folk tale "Nemelon", "*Murivy*" is the tale about ten sisters, whose names are derived from the numerals: *ymyn* – *Ymynmek*, *der* – *Denmekyye*.

Peculiarities of numbers formation in Evenks culture

Numerals, quantity play important role in the life of the Evenks. Measure words in the Evenks language comprise a broad stratum of the dictionary. As Podmaskin notes, the Evenks counting is concerned with the definite subjects and is necessary for the account of the bagged animals, tributes, tributes paid off the furs, taxes and dues, for change, purchase and sales, and also for determining the man's age. There were different ways of counting: by threes, by fives, by tens. It is possible that in the name of number fourteen *dyr nadar*, "two sevens", the trace of the counting by sevens was kept. In the Barguzin and Nercinsk dialects, number twenty has another name – *orin*, *orini* twenty pieces (Nevel'skoy, 1947).

The numerals in the Evenks language express the existing countable system, the units of this system. The countable system, as all the nations of the Altaic family have, is denary. The units from one to ten had its own names: *umun*, *umukun* "one", *dyr* "two", *shish* "three", *dygin* "four", *tyntza* "five", *nuyyn* "six", *nadan* "seven", *dypkun* "eight", *egin* "nine", *dyn* "ten". A hundred had a specific term – *nyma*, *nymadil*, the name of the number one thousand was absent. These eleven words and the word "tysyacha", adopted from the Russian language, in combination can express the whole infinitely many numerals.

But it's necessary to pay attention to the fact that according to the Tungus-Manchurian comparative dictionary of V. Tsintius, one thousand and ten thousand in the Evenks language has their own names: *miuan*- "one thousand" (and in many Tungus-Manchurian languages *ming-kan* means one thousand); *tuman* – "ten thousand" (and in many other languages *tymy*, *tyme*, *tymen*, *tu'-man* mean ten thousand).

The numbers of the second order are formed by coufounding of the number *dyn*, **ten** with the numbers of the first order. Number ten is put on the first place and the numbers one, two, three etc. are joined to it. The number ten and the joined

numbers of the first order are not changed. The numbers of the second ten are *dyn ymyn*, *dyn dyr*, *dyn ilan* etc. But the numbers of the second ten, besides the generally used (like “ten one – eleven”, “ten two – twelve”), have some different forms in the dialects of the Evenks and Evens. In some dialects of the Evenks, living on the Lower Tunguska, the numerals of the second ten differ by the fact that number ten has the suffix of the deponent case – **dyk**: *dyndyk ymyken* -11, *dyndyk dyr* - 12, *dyndyk ilan* - 13 etc. (verbatim, “one from ten”, “two from ten”, “three from ten”). The Southern form, like “one is odd from ten” or “one above ten”, is specific for the Chukchee-Koryak languages (Belyanskaya, 2013). Among the Evenks dialects, it’s (“from ten one – eleven”) spread in the region of the right upper inflows of the Aldan, from where it was brought by the Evenks groups, coming to the west from the upper reaches of the Vilyui to the North from the Lower Tunguska. This form was also met in the certain dialects of the Nenec language. In the dialects of the Evenks, living along the Stony Tunguska, the numerals of the second ten are formed from the numbers of the first order with the suffix – **delyke**, which was formed from the suffix of the ablative case and the word *kheleke*: *ymykendeleke* — 11, *dyrdeleke* — 12, *ilandeljekje* - 13 etc. The numerals of the second ten in the dialects of the Evens of Kamchatka are formed likewise: *umjen’ uljek* - 11, *djurdi uljek* — 12 etc. (verbatim, one is odd, two is odd”). The Yenisei form like “one more than” was peculiar for all the descendant of the Angarsk Tunguses, settled along the Stony Tunguska, the Yenisei, its left inflows, and also on the Okhotsk coast. The Eastern form like “ten one over” was significant for the Yukaghir and Eskimo languages and also for the Even dialects of the Yana and the Okhotsk coast (Razumovskaya, 2014).

The name of the full dozen is also formed from the numerals of the first dozen. The name of the relevant numbers of the first dozen is set on the first place; the numeral *dyn ten* in plural is set on the second place. The numeral *dyn* forms its plural form as all the nouns ending **n**: *dyn ten* – *dyr dozens*. The full dozens: the numeral *djurdjur* (20) simply means – two dozens, *ilandjar* (30) – three dozen etc.

The counting within the dozens is carried out by the way of the simple adding of the numbers of the first dozen to the names of the full dozens: *djurdjur umukjen* - 21, *ilandjar nadan* — 37, *njunjundjar djapkun* - 68 etc.

The names of the full hundreds and full thousands are formed by putting *njamadi* before the words and thousand of numbers of the first dozen: *umukjen njamadi* – 100, *dygin njamadi* – 400 etc. When counting is over ten thousand, before the word thousand they put the numbers of the second dozen in sequence, full dozens: *ilan tysjacha* – 3000, *djundjur tysjacha* – 12000 etc. For example: 15612 – *djan tuna tysjacha njunun njamadi djan djur*.

Main groups of numerals in Evenks language

In the study guide “The Evenks Language” the authors distinguish the following categories of numbers: cardinal, ordinal, reiterative, distributing, multiplicative.

The cardinal numerals mean the number of subjects. They unite the names of units, dozens, hundreds, thousands and all the complex and composite numbers of the Even language. This category of the numerals can define not only the quantitative feature of the subject, but also the abstract number. It answers the questions *ady? oki? how many?* These numerals, as the nouns, may have the limitary suffixes – rikta, - riktje: umukjeriktje “only one”, dygirikdje – “only four” etc.; concessive – *mat, - mjet*: umukjemjet “even one”, djumjet “even two”, ilamat “even three” etc. The cardinal numerals are declined like the nouns (Shelegina, 2006).

The ordinal numerals are the numerals which denote the order of the subjects. The ordinal numerals are formed from the basis of the cardinal numerals with the help of the suffixes *-i, -gi*. In modern language the suffix, forming the ordinal numerals, in its full form can be distinguished only in numerals above nine. The ordinal numerals are not derived from the numerals umun and djur *two*. They are changed by other words: njogu, jeljekjesipty – *the first*, ge – *the second*, another, ili – *the third*, dygi – *the fourth*, tunni – *the fifth*, njutzi – *the sixth*, nady – *the seventh*, djapki – *the eighth*, egi – *the ninth*, djagi – *the tenth*, djan umukegi – *the eleventh*, djan djugi – *the twelfth*, dyan ili – *the thirteenth etc.*

The ordinal numerals in many dialects are used only with the personal – possessive suffixes: ilityn – *the third*, dygityn – *the fourth*; tundityn – *the fifth* etc.

The reiterative are the numerals, which point out how many times the action takes place. It answers the question adyra? *how many times?* The reiterative numerals, except the number umne – *once*, formed from the basis of the cardinal numerals with the help of the suffix *-ra, -re*: umne, umneken – once, one time, djure – twice, two times, ilara – triply, three times, dygre – quadruply, four times, tuntzara – five times, njutzure – six times, nadara – seven times, djapkura – eight times, egire – nine times, djare – ten times, djan umukere – eleven times, djan djure – twelve times etc.

The distributing are the numerals, which point out how many subjects are taken. The distributing numbers are formed from the basis of the cardinal numerals with the help of the suffix – *tal, -tel*: umutel *by one*, djutel *by two*, ilatal *by three*, dygitel *by four* etc. The distributing numerals are inflected for case, as nouns with the suffixes of the plural. For example: Asatkar, ilkallu ilataldi. *Girls, stand by three*. Asatkar, gakallu ilatalva knigalva. *Girls, take three books each*.

Multiplicative are the numerals, used for denoting the quantity of the layers of tissue, leather, birch-bark and other subjects, which can be lined in layers. The multiplicative numerals are formed from the basis of the cardinal numerals with the help of the suffix *-man, -men*. When the suffix *-man, -men* is attached, the final

–*n* is not eliminated. The numerals are formed: umunmen **single**, djunmen **double**, ilanman **triple** etc. In some dialects the final *n* is replaced by the suffix of the plural –*r* and the following numerals are formed числительные djurmen **double**, ilarman **triple**, dygirmen **quadruple** etc. Examples: ilanmandi jellunmje chakilkal. **Put the covering for the yourt three times (in three rows).** Ilanmandu chakimnchjdu jellundu usikjen bichjen. **There was a belt in the covering for the yourt, laid in three rows.** Djunmjien udjalin imannadu ichjevchjel bichje. – **His double tracks were seen on the snow.**

Elementary geometric ideas of Evenks.

The elementary geometric knowledge, the Evenks had, are confirmed by the cultural artifacts, household outbuildings, household articles. The aesthetic needs played the main role in the development of the geometric ideas and terms of the Evenks: the desire to decorate the domestic implements, clothes and themselves. All these provided the formation and accumulation of geometric knowledge. As Vasilyevich notes, the Evenks displayed in the decorative art their extraordinary visual memory, observation, capability to embrace the exact characteristic and to describe it (Forsyth, 1991).

In the paper “Ornament of Siberia nations as primary source” (1963), Ivanov writes: “So as to create the simplest ornament, the figure of triangle with two equal sides, it’s necessary: 1) to observe the triangles have the same sizes and angles; 2) the distance between the triangles should be equal; 3) so as their peaks were oriented in the same direction; 4) so as the border of triangles was situated along the line or the correct contour”. The said above shows that at creating the ornament, the man is motivated not only by the characters and artistic excitement, but also by the feeling of measure, order and counting.

The decorative art of the Evenks was reflected in bone carving, wood and iron engraving, in making of the wooden figures, casting of the figures out of lead and strannum, in hammering of different subjects, in laying of the silhouette pictures on the wooden subjects with the paints, lettering on the birch-bark, in sewing out of fur strips and squares, in embroidering by the seam with the under neck white hair of the deer, by the seed beads, the engraving of the figures out of birch-bark (Golovnev, 2011).

The ornament of the Evenks was linear-geometric: lines, stripes, arcs or archlets, circles, alternate squares, triangles, rectangles, zigzags, cruciform figures. The process of taking out from the birch-bark of the triangles and ornament, constituted from the combinations of such removals was named duktyke. The straight whittled lines were called ugur (from ugu – “to cut straight lines”). The semicircles were named the same way as the action itself – tynire, and the ornament of semicircles – tyn irek. Another two curls were cut – djolog ien (the ram’s horn) and seli ien (mammoth’s horn, that is mammoth’s tusks). They were joined

with their ends into the definite picture. The Evenks attained perfection in the art of fur mosaic. The craftswomen composed the patterns out of fur pieces on the breast collars, coat backs, torbasses and carpets. For decoration of the fur clothes they combined the stripes of white and black fur. But the floral patterns and figures of animals are not alien for the ornamental art of the Evenks. The décor significs was determined by the nature cult (Vasilevich, 1963). The stylized figures of the wildlife are painted in the ornament: waves, clouds, plants, sometimes to the geometric ornaments they added the figures, the schematic drawings of the deer, bears, elks, musk deer, birds and men. There were the circles with a dot and without a dot in its center like rosaces on the clothes, the astral signs, the space symbols: the sun, the stars, world structure. The triangle ornament – the symbol of the female, associated with the ides and the cult of strengthening of the community's power.

There is a long range of symbols and allegory, which today one can read getting the certain information in the results of the decipher.

They carved the stencils of the birch-bark for cutting out of the textile applications to decorate the birch-bark vessels. The ornament was applied with the help of the knife on the bone plane items. The circles with a dot or the concentric circles were applied with the simplest improvised pair of compasses. The pair of compasses for drawing of the circles in the ornaments on the bone was called nabun.

Applying of ethno-mathematical knowledge in pedagogics

A riddle – tagivka, nonobko is one of the means of the folk upbringing in the ethnopedagogics of the Evenks. The riddles give a child the possibility to get the totality of data about the environment during the process of the dynamic mental activity that is essential in the intellectual upbringing. The Evenks riddle itself often suggests the subjects of the riddle. Thanks to it children use the riddles and games early enough, that promotes the language and intelligence development (Merlina, 2012).

Among the Evenks riddles they distinguish the riddles with numbers. With the help of these riddles the primary interest was arisen in children. For example:

“An old man, wandering under the ground, the human reindeer catches?” (seine) («Umukan atirkan, dunna hargildalin girkudana, ital nmrwotin doromiwiki» (Ircaciwun)).

“One man is the smartest among smart” (wit of a man) («Umukan baja hawaduk-ta hawa» (ila dalin)).

“Two men argue: I'll overtake you, I'll overtake you! (skis) (ur baja makkuscara bi sinawa bokondiqaw, bi sinawabokondiqaw?» (Kinqal)).

“Two elks graze on the hillside!” (ears) («Dur motil oijkodoro kaltirdu?» (Ser)).

“Two ravens compete and compete, but no one surpasses? (black spots on the hare’s pads) («Dur karal gukcanma, awgutin-mal awki suptira?» (Tuhaki koqnolin serdun)).

“Two brothers can’t see each other?” (eyes) («Dur pekipap men menmer alii icaldira?» (ehal)).

“Three men run, saying: “I’ll overtake, I’ll overtake, I’ll overtake; but no one outruns?” (skis and stick)) («bajal gukcandara, gundanal: bi Imptidam, bi huptidam, ni-da awki huptiwa?» (Huksilla, howgura)).

“Each of five men has a yourt?” (a glove) («tiptza bajal umutal dueil?» (Kokollo)).

“Ten men carry ten ice-cakes?” (nails) («Dan baja, dan dukawa idanara?» (ohiktal)).

“Ten valuable, the old woman was lowered down?” (Yellow daylight) («Dan dakaci dandurin atirkan bica?» (kagke)).

“Twenty men the brothers were with four hats” (fingers and toes) («Dur-dar bajal nakunahal bical, digin awucil?» (Halgar)).

“A wrinkled old woman lived with ten treasures?” (Cabbage) («Djan djakalkan djandjurin atyrkan bidechje»).

Rhymes from 1 to 10. The Evenks paid special attention to the intellectual upbringing of the younger generation in the folk system of upbringing and education. Children from the early childhood were fostered interest in counting. The child, learnt to talk, studied to count to 10. For it they had a special rhyme, which simplifies the memorizing of the number order by pronunciation of the thematic word, which started with the same syllable as the number (5, p. 186).

The rhyme was written by Vasilevich at M.Moldyakitov (9, p. 132):

Umun - umukta (one – egg)

Dur – dudukan (two – butterfly)

Ilan-ilagli (three – piglet)

Digin – dikəcən (four – fly)

Tunna – tuksaki (na – tuksaki (five – hare)

Nunun – nuriktə (six – hair)

Nadan – nanna (seven – skin)

Dapkun – daw (eight – boat)

Jəgin – jalwuka (nine – moss)

Dan – dantaki (ten – wolverine)

Games on counting. School-age children, who took part in economic life, mainly played the action-oriented games: balikat — blind man’s bluff; djejikjet, tuksavki, dalundjavki — tag games; chukchjekjet, kopilkat, chanankat, amunchikat — game “Kites”; hjekuke-ininike — “hot – cold” – hidden object game; kirutkat, dojarukan, hjerjelibpiui – fishing out of the subject game. Among the Evenks childish games, they distinguish the games on counting, on quantity, which

promoted the counting development in children. The children of the stony-tungus Evenks played havsidugat. This game's aim was to toss-up the "small bottle" lupuri with the shovel. The wooden shovel havsidu had a short handle, but lupuri presented small bottle-shaped wooden figure with the lock of the underneck hair, clued to the beak. The person, who tossed up the more times, won the game. Another group of the Evenks named this game paksidu, a padded ball replaced lupuri. They also had the game kalikatkak, started with the holing of the wooden ball by the shovel kipakavun with a long handle into the hole. The person, who holed the more times, won the game. The shooting with the blunt arrows from the bow into the ice wall with the thickness about 2 m and height 1 m. The person who pierced the ice considered to be a winner. The shooting onto the pole – for game they chose the flat area on the snow, made the hole and in 50-80 feet away they drove a stake and they shot into the pole in turns with the blunt arrows. Shooting into the hoop or ball – they drew the line in the middle of the clean area, and in the end of the area the judge was with the hoop of willow. On a signal, he threw the hoop along the line. The players should have shot into the moving hoop. The person, shot more times with his arrows, was considered to be a winner.

Conclusions

Mathematics is the science the comprehension of which is impossible without sequential thought and skill to analyze exactly the events. The main aim of Mathematics was revealed by O.Shpengler: "Each culture has its own mathematics" (Dyachkovskaya, 2014). That's why the formation of the mathematical culture encourages the grounding of any other culture.

Mathematics and Mathematical culture are not the identical terms. Mathematics is principally scientific knowledge, culture include this scientific knowledge, but is not reduced by it. The term "Mathematical culture" is used to denote what way the person interacts with knowledge like mathematics and how Mathematics can influence the structure and inner world of the person. The term "mathematical culture" is significantly wider than just a system of mathematical knowledge, skill and attainments.

The comprehension of the mathematical components in representatives of low-numbered peoples of the North is based on the figurative presentation of the world around them, which significantly makes difficult the formation in them of the scientific worldview. Besides, the native language of the peoples of the North has practically no words, denoting the terms of mathematics and geometry. However, it does not exclude the absence of the ideas about the objects in them. Exactly the geometric component differs from other components of the natural-scientific worldview by the fact that it provides the appearance of the form-making image in consciousness, providing the "picture", entirely of reflection by the consciousness of the fundamental interrelation of the universe.

One of the researchers of the linguistic and scientific worldviews, Kornilov finds this interaction in the following: “Having the same substantial invariant for all people, the scientific picture of the world (SPW) gets in any national language the national form of expression by the formation of the national terminology on the mother-tongue of the native speaker of this language. The national language composition of SPW by no means touches upon the substantial part of SPW, but only adapts the universal knowledge to the needs of the concrete linguistic community” (Golovnev, 2011).

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