

Warasa wekamu

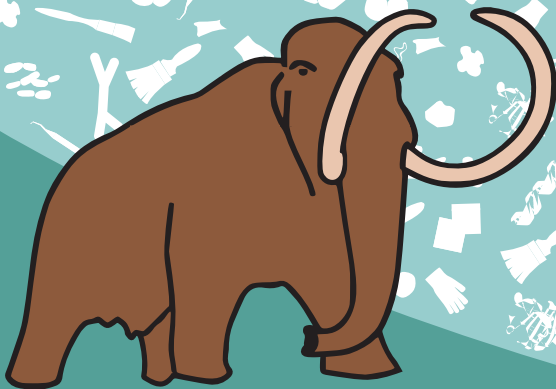
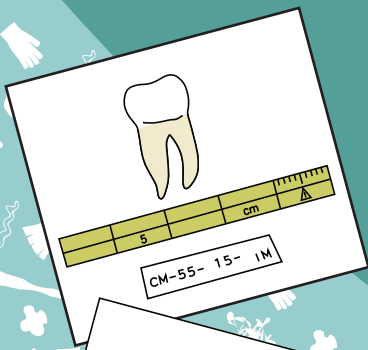
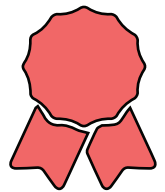
# CIENCIA ARQUEOLÓGICANAM



Papiya juka junauwaiti:

Naa

Arumai bioarqueóloga/o  
atin asa emtika  
nekapmamau

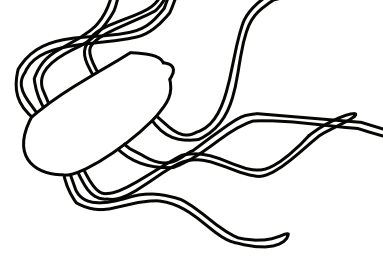


Papi yakartin

Ciencias de la Historia Humananmaya  
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Warasa wekamu



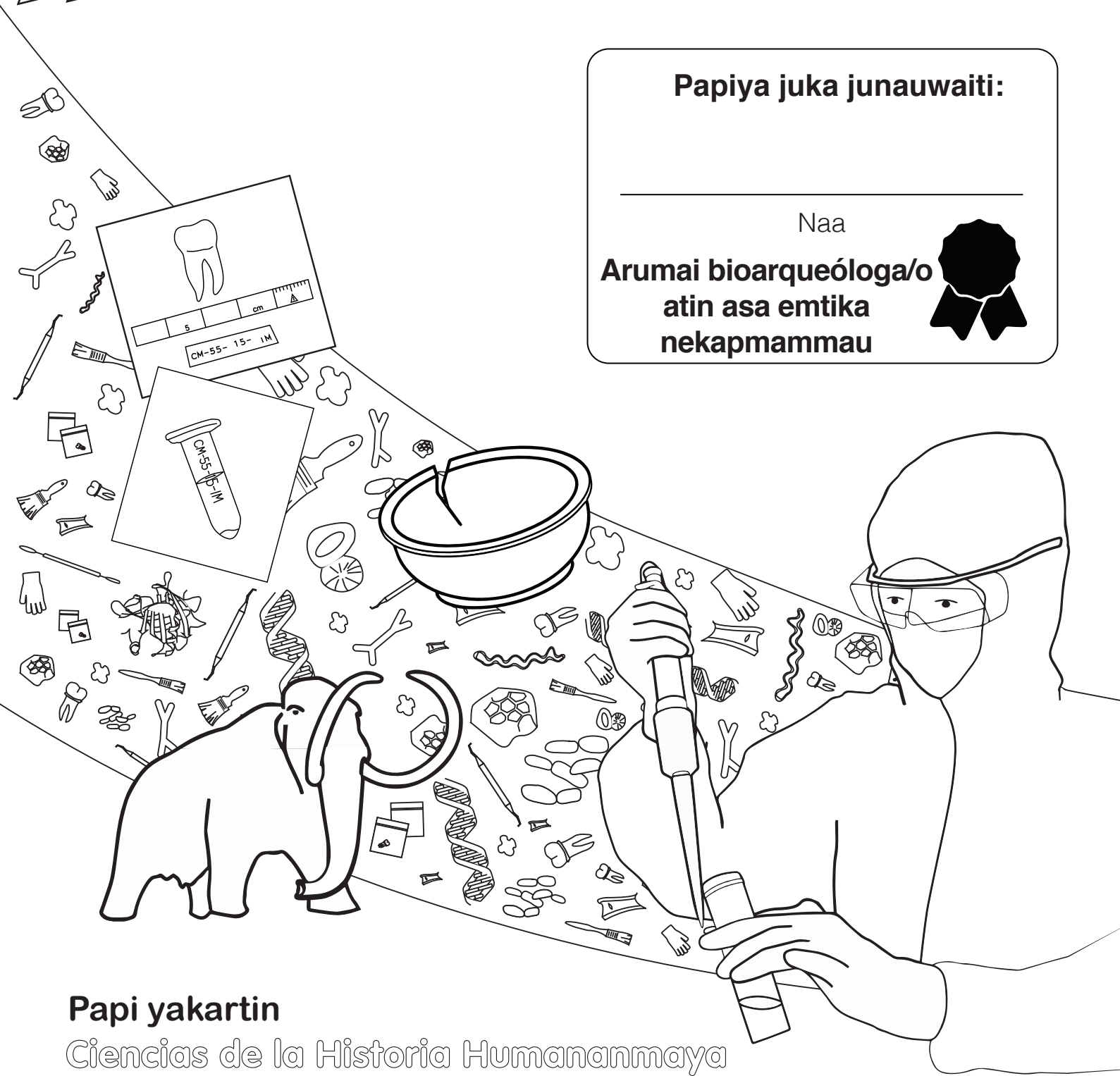
# CIENCIA

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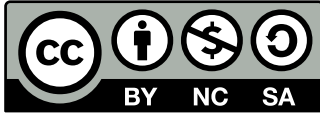
Åshild Vågene

Ke Wang

Christina Warinner

Dina Ananco Ahuananchi wampis chichamnum aara iñankakmau.

Papi yakartiña juka najanamuiti yacha científico aiña papi takasmau iisar unuimartaj tamaunam.



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2022



# YA AIÑAJ

Yaunchukia shuarsha urukuk ajakaruit tusar, shir nekattsar, bioarqueólogo aiñatika científico takati tura enentai yamarmajai papi tishiprar iin aiñaji.



Paletín

## Ikamka...

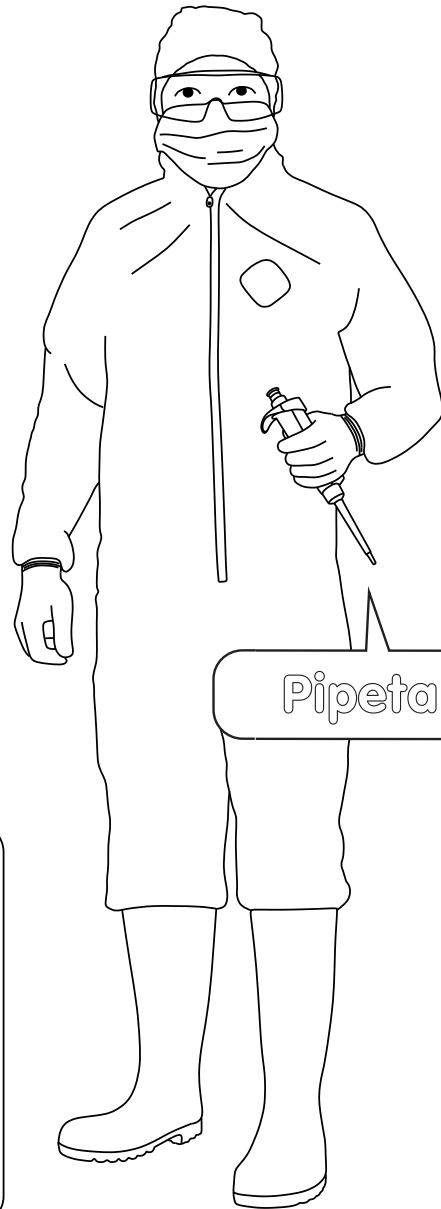
Bioarqueólogo aiñaka arqueólogo aiñajai jimarak takaiñawai ikam taitin mamikmamunam tura laboratorionmasha warin iistiñait nunasha juwaiñawai.

Jutika takamunmaka awai ukumasmau iyamu, yaunchukia takatai aiña tsainkaunksha juwamu, tsuat ajaptaiñam kuntiñan ukunchi atsuash tusa iyamu tumachkusha cribanam iñankakir arak ajaku juaku atsuash tusar nekattsar iyamuiti.

## Laboratorionam...

Yaunchukia aiña urukukit tusar iistin yamaiya ADNjai pachimrar penkerchau ujuakaj tusar ADN yaunchukia jukir takakkrika, científico aiñaj nutika salasha wapikchaunam, jaancha jui takakur nunkurtin, tusa, enentaimsar apakmau nunkurar, guante tura botas weamakar takaji.

Yaunchukia aiña iistiñan científico takaiñakka shir umintsar, warin ju iyakur takataiyait nunaka ashi jukiar takaiñawai.



Pipeta



# NUNKA TAAMU

Bioarqueólogo aiñaka, ju nunka jui yujawai shuara pujuti aujmatmaun tura ti yauchukia shuaran pujutincha tishipar iññak. Juinka, nunka taakur warí takataiya au penkersha atsumtainti. Jumamtin amainiti: nunka Himalaya tuiña nuinka, arqueólogo aiñaka atsumaiñawai, jui takamainiti tusa papi jintiarar najanamun nuyasha nain warakkriشا warin atsumtaiyait nunasha ashi.

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Passport No.  
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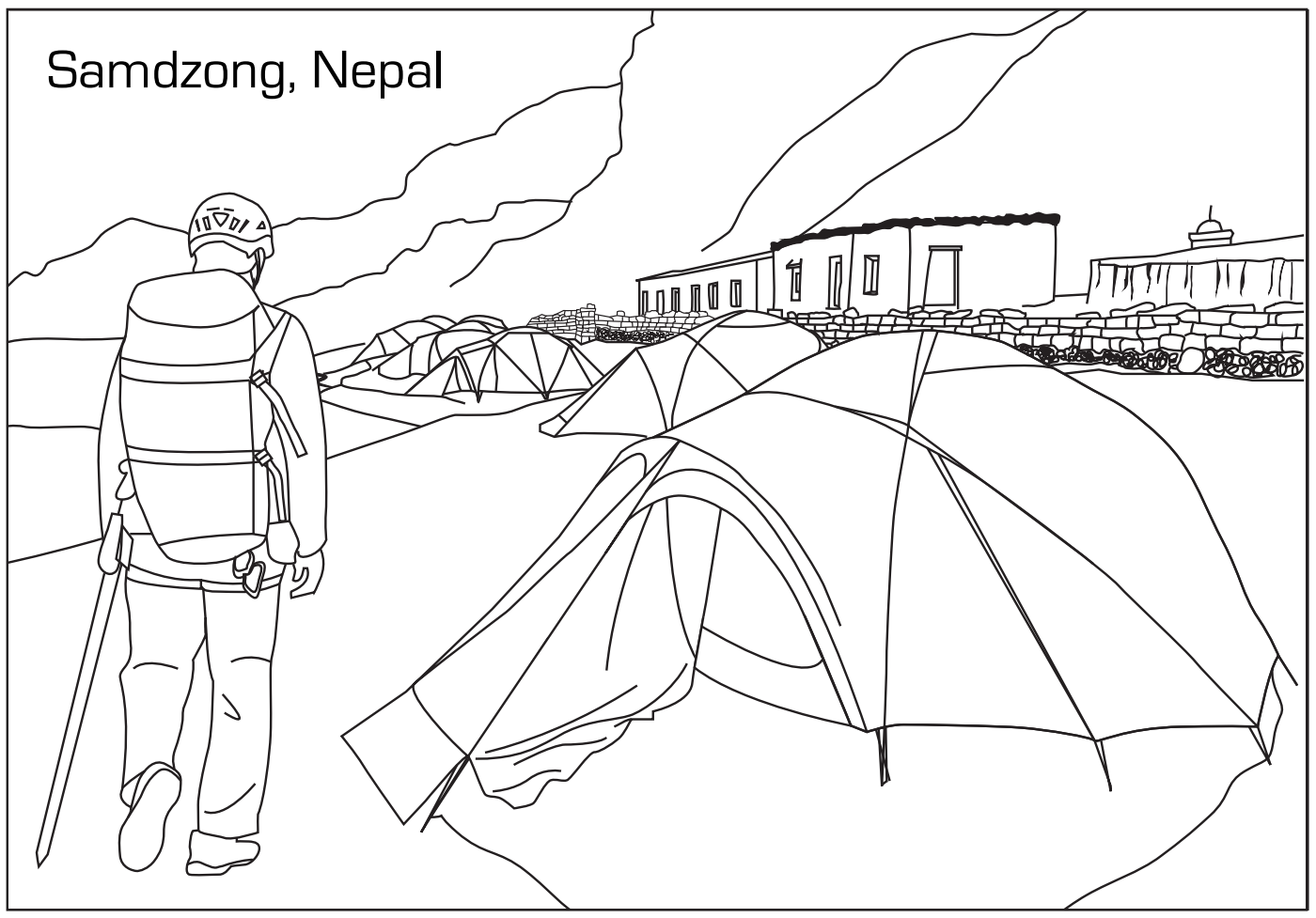
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Entry Fee Receipt  
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## Samdzong, Nepal



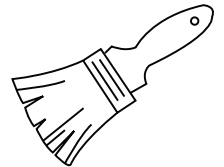
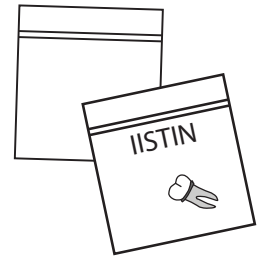


## Calcio tura fósforo naiñam peemar juaku iisar nekamu

Juka placa dental tutainti, iwaku pujaj nui shuarti iñashi iismaka, calcio tura fósforo naiñam peemar juwa ima nuke kaya iman weawai. Jui peemar juwawai bacteria tura yurumak yuamusha, tuma asamtai, ju iisar shuar wariñak yuu jakuit tura jatsukeash puju jakuit nusha ashi nekatainti.

## Ukunch tura nai aiña

Ukunch tura nai aiña nunaka arawai ADN, ju iisar, yaunchukia shuarsha imatain yujakaruit, urukuk armia imtisha, wiichisha, tikich nunkanmasha uruk pujtnasha unuimatkarukit tusar, tishiprar aujtusar nekatainti. Jata epidemia iyarmaunam shuar jakauwa nuna nai iisar wari jatajain jakauwait nuna ADNri nekatainti.



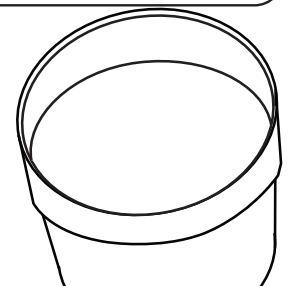
## Ichiñak weantu tsainkau aiña

Ichiñak weantu tsainkau aiña nui amainiti arakan tura kuntiñan penkeri (proteínari), arak microscopiojai wainmain tsainkauksha tura kuntutkesha. Ju juukar, tishipsar aujtakur nekamainiti yaunchukia shuar yurumajakmau.



## Kuntiñan ukunchi aiña

Kuntiñan ukunchi aiña tishiprar aujsar nekatainti yaunchuksha wariñak yuu jakaruit. Nuyasha radiocarbono tuiña nui enkekar iyamsha imanketi, jutikakur nekatainti yaunchuksha urukunmak matsamajakaruit.

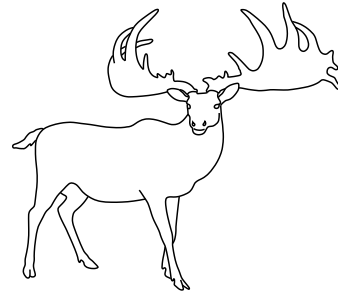
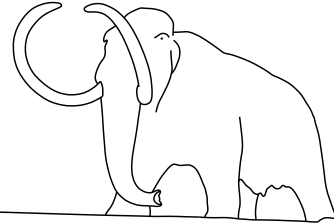
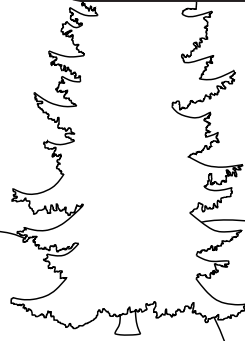
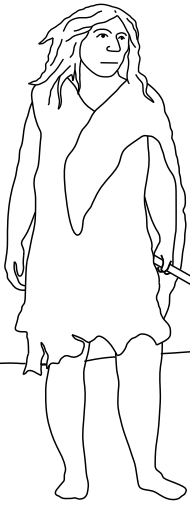


## WARI AUJAJ

Yacha bioarqueólogo aiña nuka, ju aujtakur takastin tusar, shir chichamrukar jintamrua umikmaun nuyasha tecnologíasha penker najanamun etenka juki aujaiñawai pujutcha yauchuksha urukuk aya nu shir nekataj tamau asamtai. Ukunch, nai tumachkusha ichiñak weantu tsainkau wainkar, junincha warijain iisar nekataiyait nu metek umikar, shir iisar nekakur, nukap enentai jumainiti.

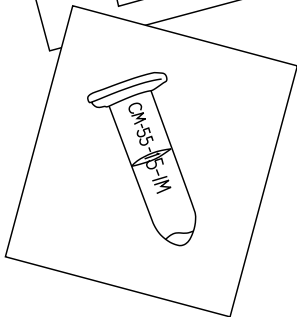
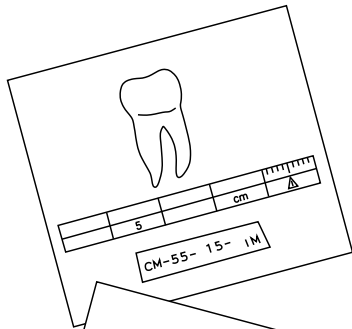
## AMESHA NEKAMKIAM...

Neandertal shuar tuke jiñamuka 40 000 uwí iñankaki weawai, tuma ain, africanmaya shuarchau aiña nuna numpen neandertalan ADNrinka awai.



## SHUARTI URUK NA JANAKMAUKIT

Yaunchukia ADN juki iisar nekatainti iña ika yachi/umai urukuk armia: neandertal shuar aiña.



## Yapajinki weamu

Yaunchukia shuara ukunchi tura nai tishiprar aujsar weakur nekatainti ii untrisha uruk matsamajakarukit tura uruk shuartisha ii yamai urukuitaj imajsha najaanakuitij.



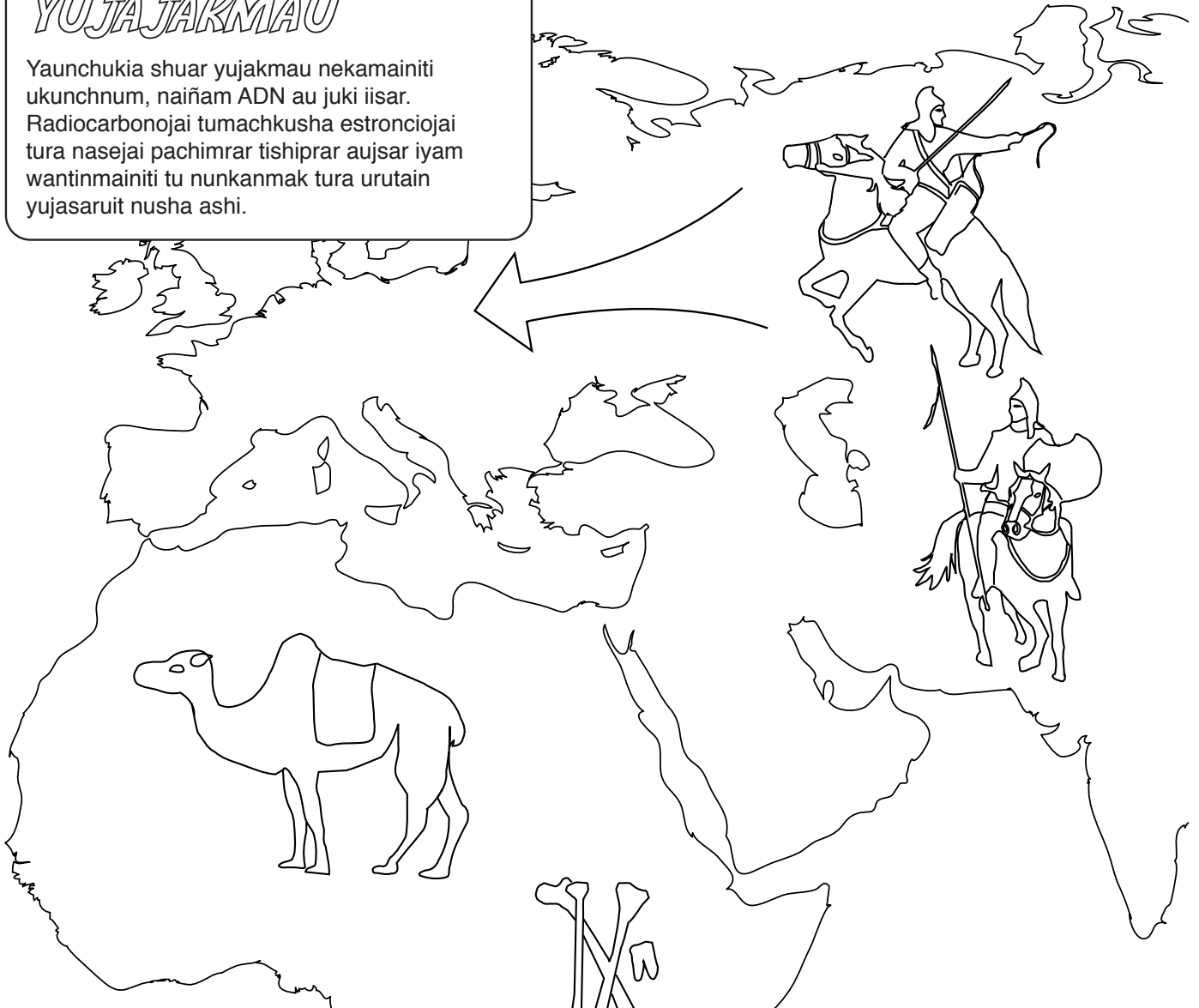
Escitas, Asia Central

Edad del Hierro 700 C.T. (Cristo

-Taatsain wampis chichamnum aarmau-)

## YAUNCHUK SHUAR YUJAJAKMAU

Yaunchukia shuar yujakmau nekamainiti ukunchnum, naiñam ADN au juki iisar. Radiocarbonojai tumachkusha estronciojai tura nasejai pachimrar tishiprar aujsar iyam wantinmainiti tu nunkanmak tura urutain yujasaruit nusha ashi.

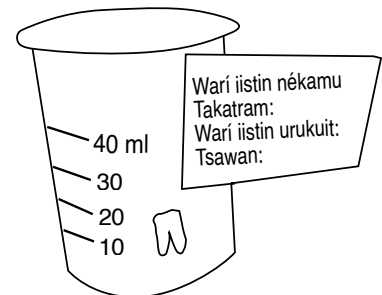


## AMESHA NEKAMKTAM...

Radiocarbonoka tumachkusha  $^{14}\text{C}$ ka, carbono isótoporiyaiti, junaka arak aiña etsa sukuam nasenmayan juawai. Kuntinka arakan yuiñak nita tejidorin radiocarbononka juiñawai. Radiocarbonoka tsawan nankamaki weakai imanchau weawai. Yaunchukia warí aiña nuna urutmak  $^{14}\text{C}$  ara nu nekapma iisar, iwaku pujusmausha urutma tsawannak iñankaki wea nusha nekamainiti.



## Radiocarbonojai nekapmamu

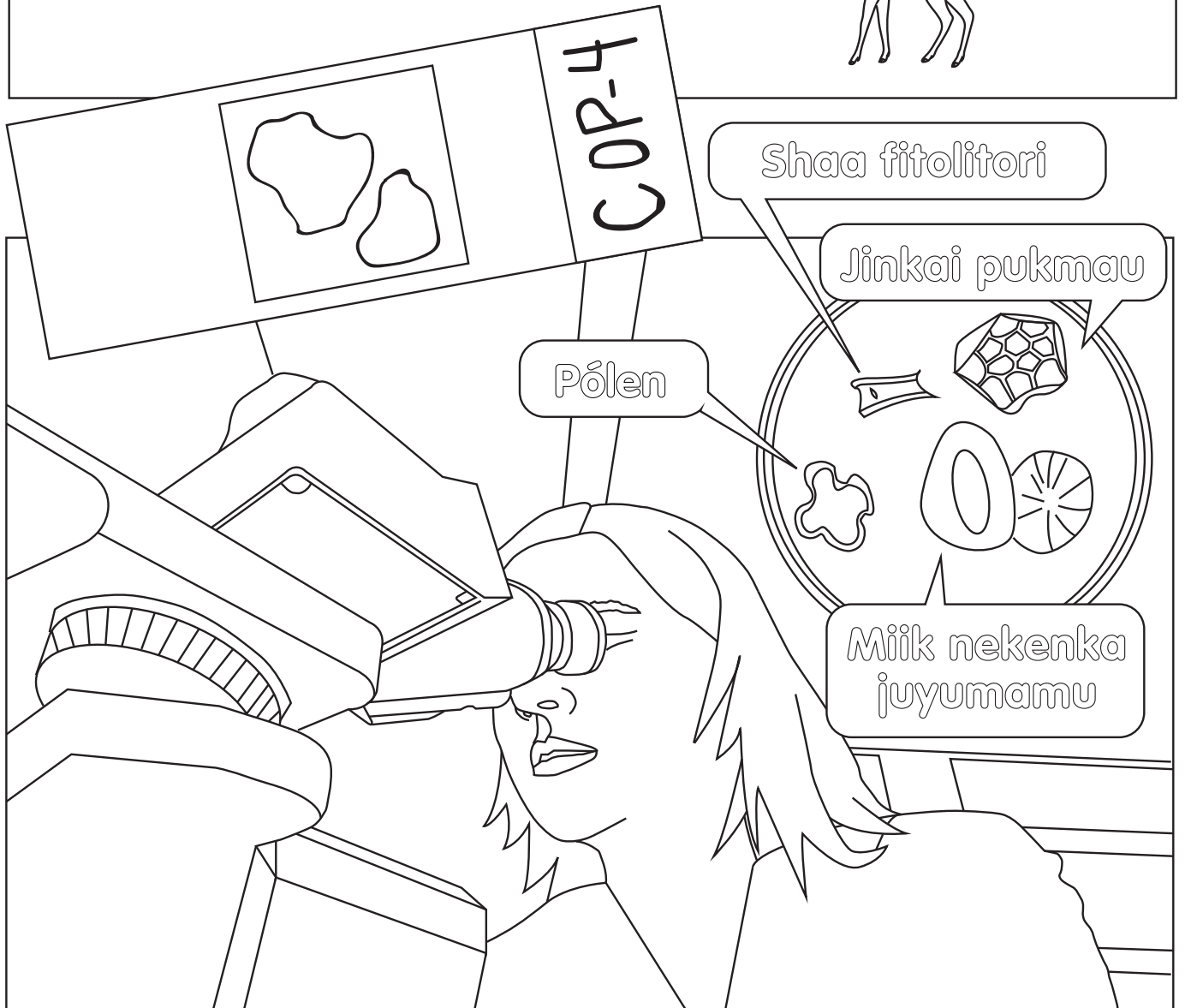


Yaunchukia arak tura kuntin 40 000 uwi iñankaki wea nekamunam radiocarbonojai nekapma iyamuka penkeraiti.

# YAUNCHUKIA YUJAKMAU

Científico aiña nuka yaunchukia ichiñak tura shuara nain microscopiojai iis yutai peemar juakunka wainmain aiñawai. Junin “yutai jijai wainmainchau” aiña tishiprar iisar nekamuti, maya shuar Mesoamérica naya, 2000 uwi iñankaki weaj nui iruntsasha wariñak yu armia.

Copán, Honduras; Maya yaunchukia, uwi 300

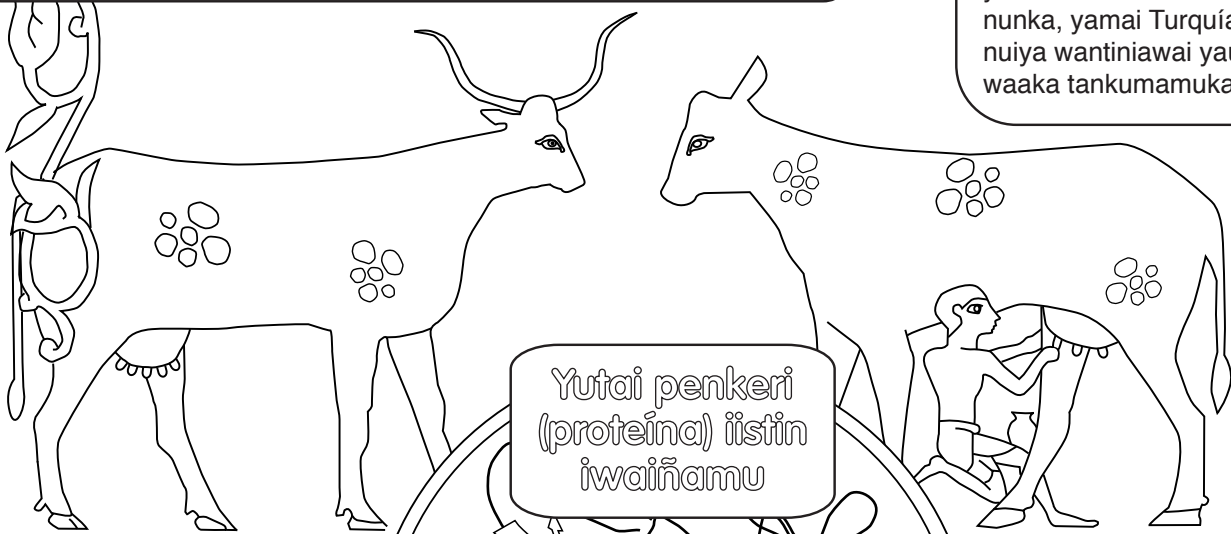


# TANKUMTEAMU

Shuartika, kuntin etenka tankumkir tura araksha nutiksarik arakir 10 000 uwi iñankakir weaji. Kuntik yama tankumamuka waakayaiti, yaunchukia shuarka juna tankumajakaruiti nunka takastasa, namanken yuattsas, muntsurin umuttrattsas tura nuapen takasartasa.

## AMESHA NEKAMKIAM...

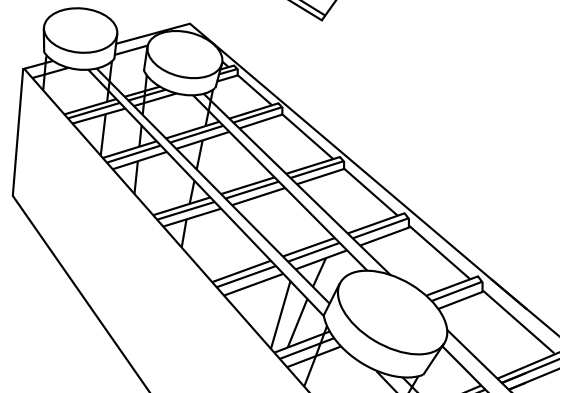
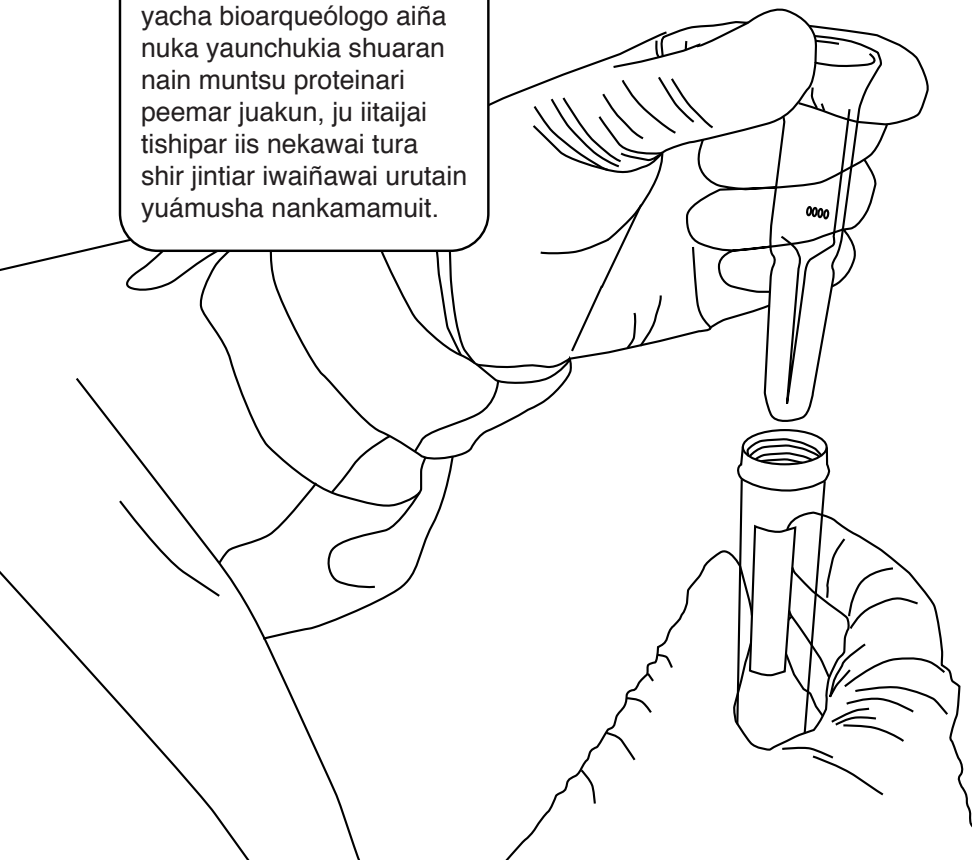
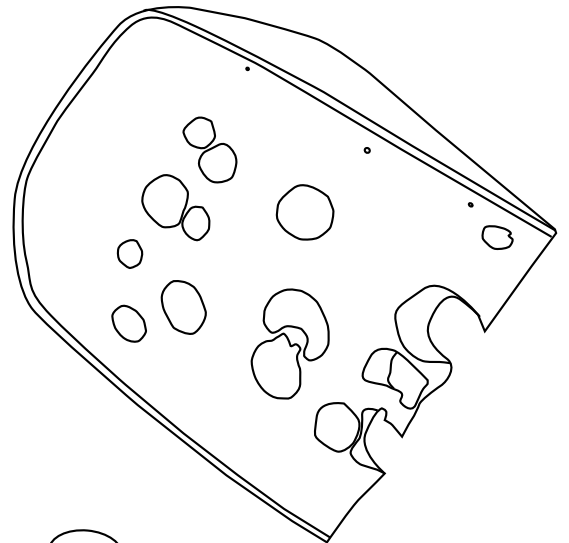
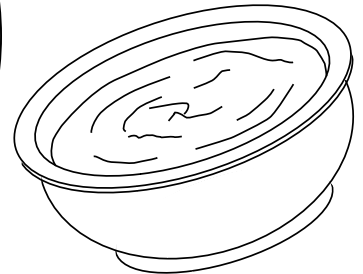
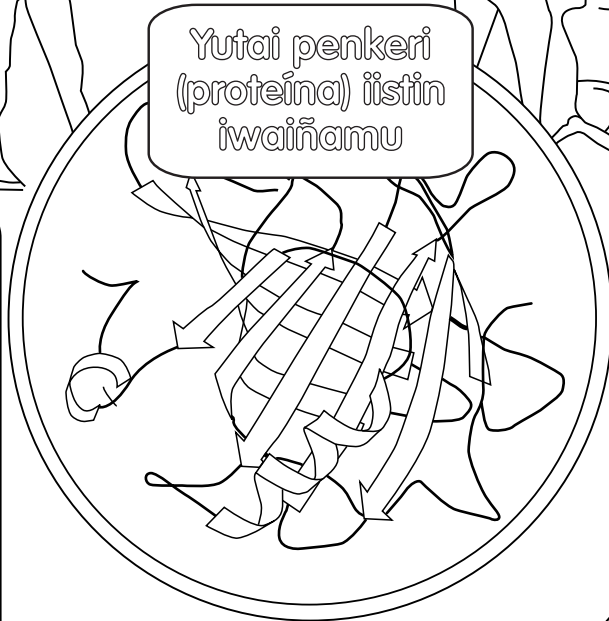
Waakaka europanmaya bisonte tutai (uro tutai) tankumajakmauwaiti, juka kuntin shir uun, amukmau asa yamaika atsawai. Anatolia nunka, yamai Turquia tuiña nuiya wantiniawai yaunchukia waaka tankumamuka.



Yutai penkeri  
(proteína) iistin  
iwaiñamu

Yutai aiña  
muntsujai  
shir takasa  
najanamu  
nekamu

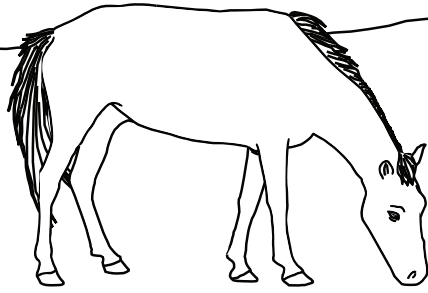
Urutain najanamuit nu mamikma nekantsui yutai aiña muntsujai najanamuka, turasha yacha bioarqueólogo aiña nuka yaunchukia shuaran nain muntsu proteinari peemar juakun, ju iitajai tishipar iis nekawai tura shir jintiar iwaiñawai urutain yuámusha nankamamuit.



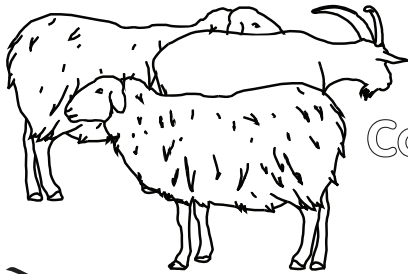
# Mongolia nunka

Mongolia nunkanam kuntin pachim iruneawai, jui awai caballo, waaka, yak, cabra, oveja, reno tura camello aiña. Yaunchukia shuarka juu kuntin aiña juna muntsurin ijurar shir takas najana yujakaruiti.

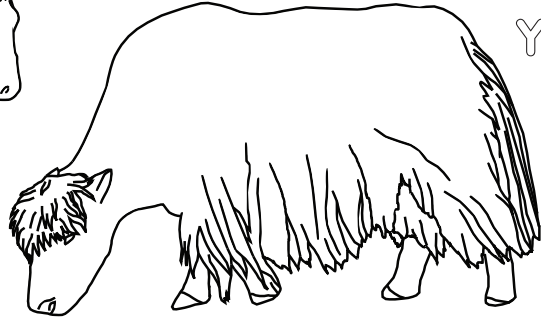
Caballo



Oveja



Cabra



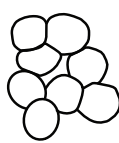
Yak

Waaka

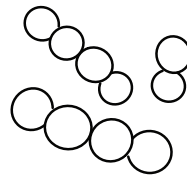


## YUTAI AIÑA MUNTSUJAI SHIR TAKASA NAJANAMU

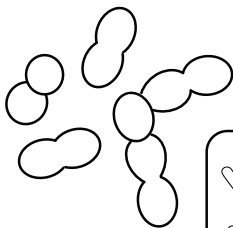
Mongolia nunkanmaka, ti penkeraiti yutai aiña muntsujai shir takasa najanamuka. Arqueologianam tishiprar aujsar nekamua nu iisar nekaji ju yutai yujakmau 3500 uwi iñankaki wea nuka.



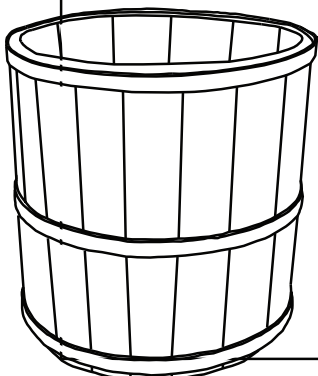
Staphylococcus



Lactococcus

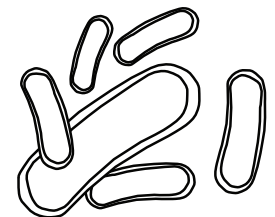


Leuconostoc



## Yutai aiña muntsujai shir takasa najanamunam jijai wainmainchau iwaku puja nu

Bacteria tura levadura aiña nuka penkeraiti yutai aiña muntsujai shir takasa najanamunam, juka aiñawai yogur, mantequilla tura queso nuyasha tikich imatiksa nekachtai awai aaruul (quesojai metek) tura Mongolianmaya airag tuiña nusha (yegua muntsurijai cerveza najanamu).

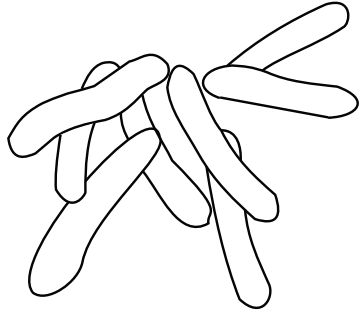
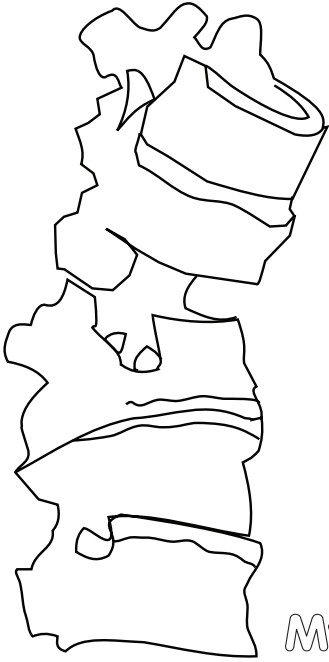


Lactobacillus

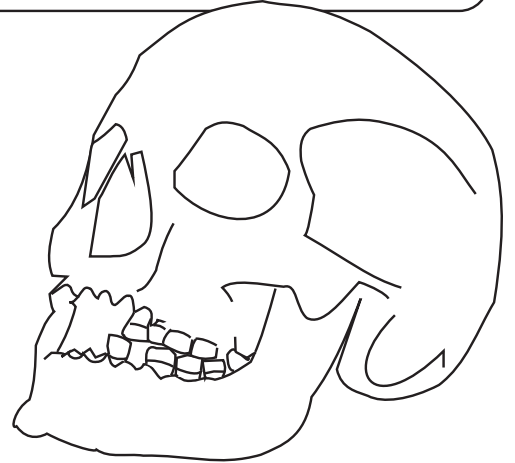


## JATA TUBERCULOSIS TURA LEPRA

Jata tuberculosis tura lepranka juu bacteria itawai: *Mycobacterium tuberculosis* tura *Mycobacterium leprae*. Juka ukunchnumsha achirkateawai, tuma asamtai, científico aiñaka juna iis, yaunchukia jata aiña jusha uruk najanarukit nuna shir aintas nekaiñawai.

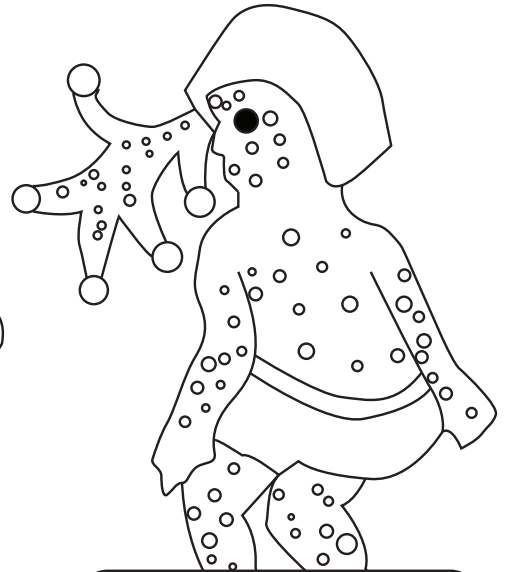


*Mycobacterium leprae*

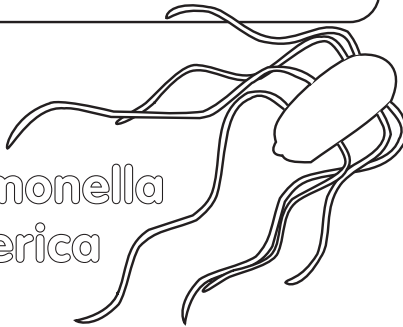


## COCOLIZTLI

Jata penke nekachmau, azteca shuar Cocoliztli tu anaikamu, uwi 1545 tura 1550 ejemunam Méxiconmaya shuaran 60% tumachkusha 90% iman ijiñawati. Juu jatajai shuar jijiñawarua nuna nai iis yamaipat wainkaruuti jata *Salmonella enterica* Paratiphy C ADNrin



*Salmonella enterica*



## Dr. Schnabel

“Nasemraij”, tusa, yaunchukia ampikratin aiñaka nu siglo XVIItn shuar sunkuran tukumi jaan tsuwakka, chinki muukeya nuninjai yapin nukukar yuja jakuuti.

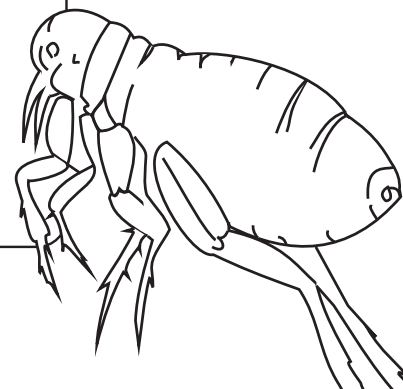


## Códice en Cruz

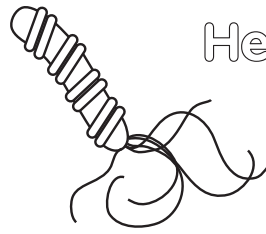
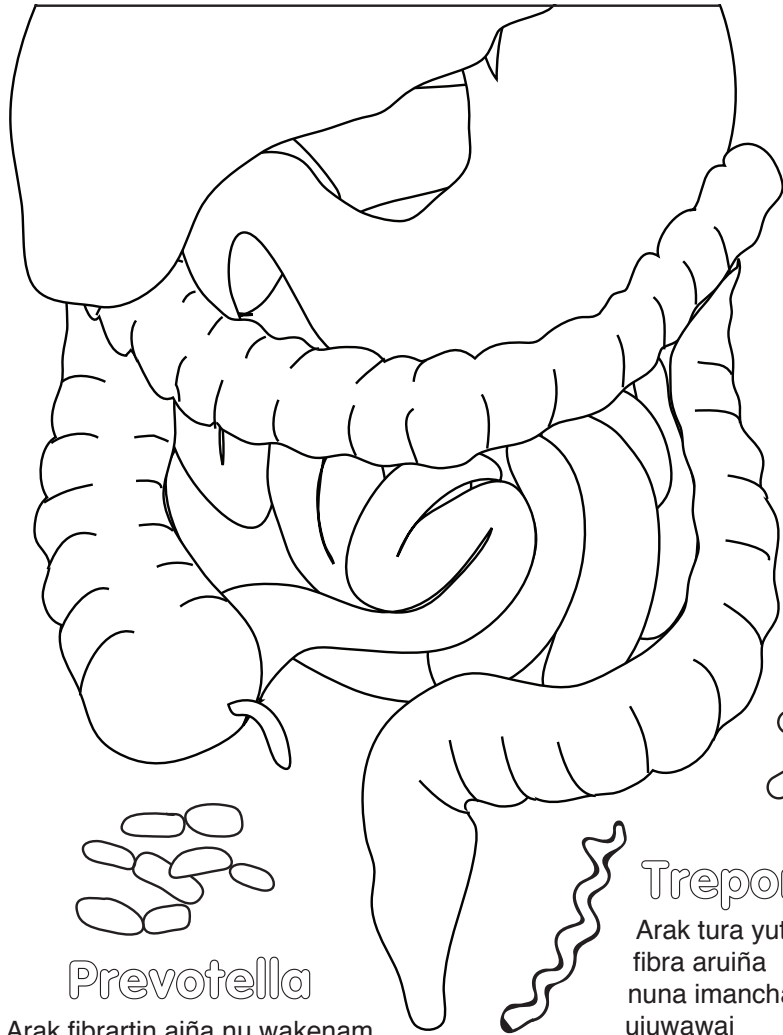
1550 uwitin azteca shuar papi aarmaunam Cocoliztli jata tukumir uruk jatainkit nu aujmatmau awai: tsuemu, supiamu tura numpa puara jaamu.

## PESTE

Bacteria *Yersinia pestis* naartin peste jatanka itawai, juu jatanka katip achimakun temashik mukuna napampawai. Juu temashik mukunam shuarka peste bubónica tuiña nuna tukumi jaiñawai. Europanmaya shuaran juu peste ijiñawaiti, tuma asamtai, Jaamu Mukusa (1346-1353 uwitin asau) tu anaikamuiti.

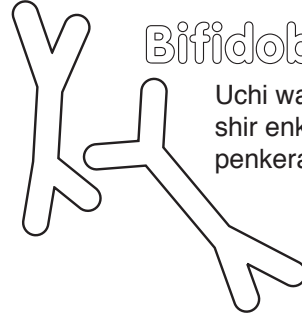






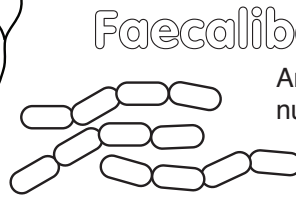
## Helicobacter pylori

Tantannum pujawai tuma asamtai, shir kuitamamchalinka juke jata úlcera tura cáncer najanamainiti



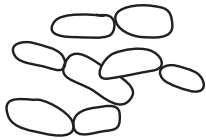
## Bifidobacterium

Uchi wakenam muntsu shir enkerti tamaunam penkeraiti



## Faecalibacterium

Ampujnum célula iruna nu yuatnun najaneawai



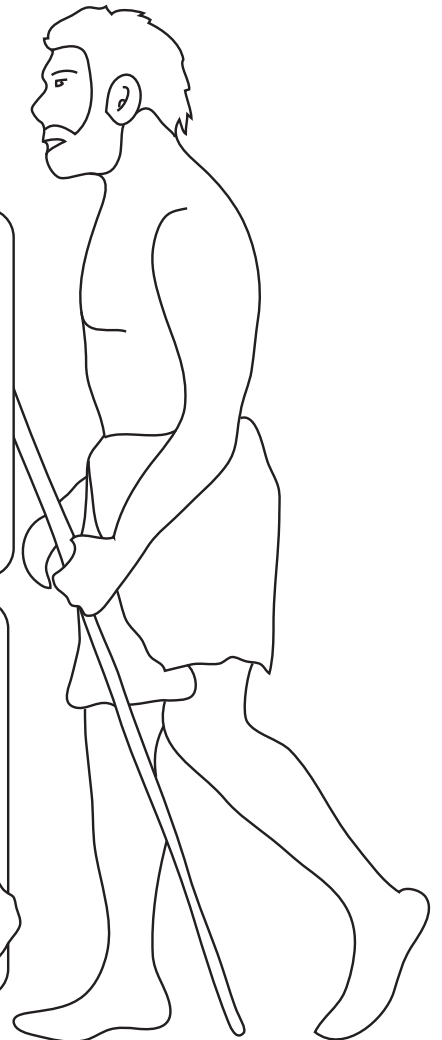
## Prevotella

Arak fibrartin aiña nu wakenam shir enkeamunam penkeraiti



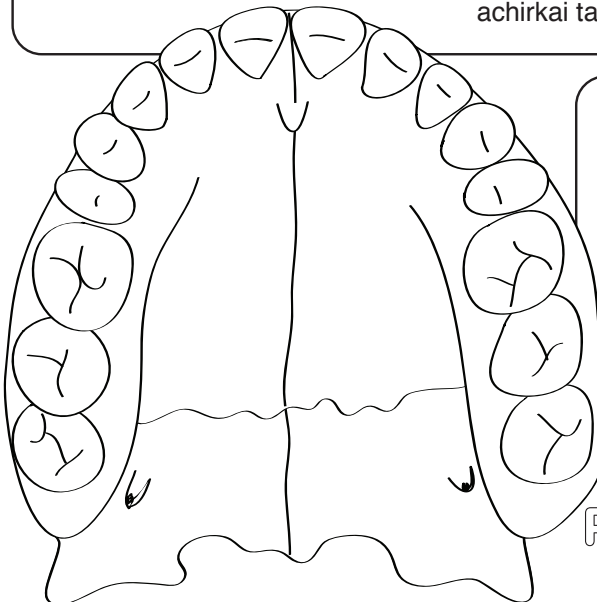
## Treponema

Arak tura yutai fibra aruiña nuna imanchau ujuwawai



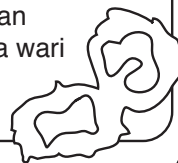
# YAUNCHUKIA SHUARAN MICROBIOMA IRUNTUJAKUA NU

Iyashminka trillones ta iman nukap bakteriaka arutrtameawai, ju ashi irumrar microbioma tutainti. Bacteria tantanmin pujuiña nu yutai penkerin etenkea asa penkeraiti, tuma asamtai jatsuk pujutainti. Iyashmin bacteria iruna nuka jata pemmainchau emaju asa penkeraiti tura wenenam bacteria pujuiña nuka jata achirkai tamaunam kuitamkartawai.



## AMESHA NEKAMKIAM...

Científico aiña nuka calcio tura fósforo naiñam peemar juakun nuyasha yaunchukia shuaran ijin juki iis nekau aiñawai yaunchukia shuaran microbiomarin tura wari jatajain jakauwait nunasha ashi.



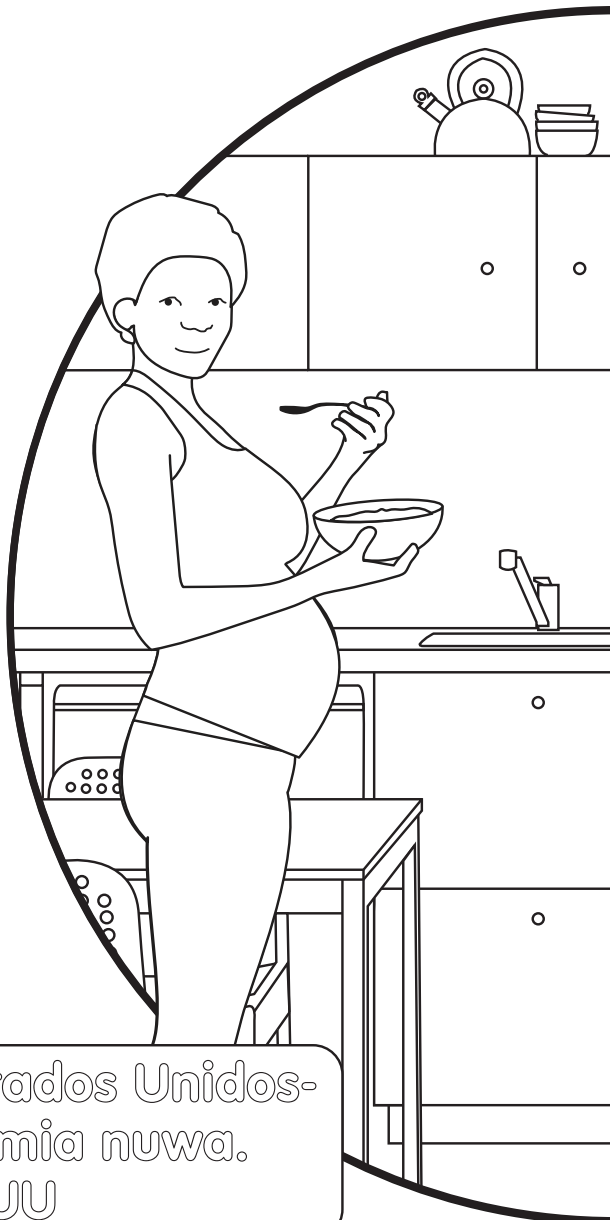
## Porphyromonas

# SHUAR AYA YUJAS JUUK YUSA PUJU AIÑA

Shuar aya yujas juuk tura eakmak yusa puju aiñaka ikamian yuu aiñawai, tuma asamtai uwitin tsawan yapajinmaujai metek naisha yapajiniawai.

10 000 uwi iñankaki weaj nui iismaka, shuartika arakma yuchau asar aya juukar yujakuitji.

Shuar fábrica matsakmaunam pujuiña nu yamaiya shuar aya yujas juuk yusa puju aiña nujai apatka iismaka iñannamua juna ampujen microbioma ima nukap aruiñawai.



Estados Unidos-  
numia nuwa.  
EEUU



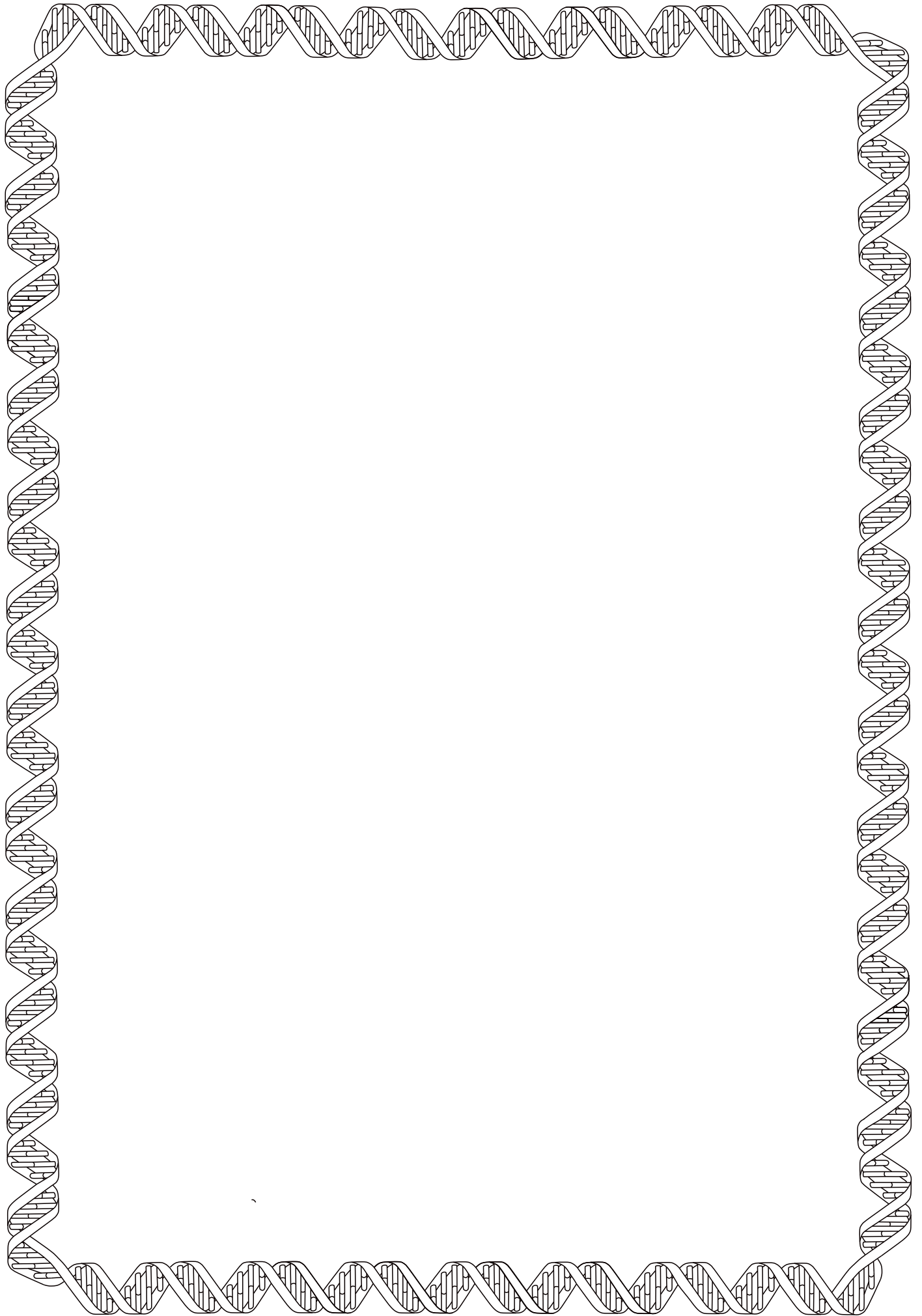
Hadzas,  
Tanzanianmaya  
nuwa tura uchi

# SHUAR FÁBRICA MATSAKMAUNAM PUJUIÑA

Shuar fábrica matsakmaunam pujuiña nuka yutai suramun aya sumak yuiñawai turamtai arakan juki yutai najanaña nuka ujumketi.

Yaja nunkanmaya juki itamu awai yutai aiña shir takasa ukusmau tura kuitamkamu.

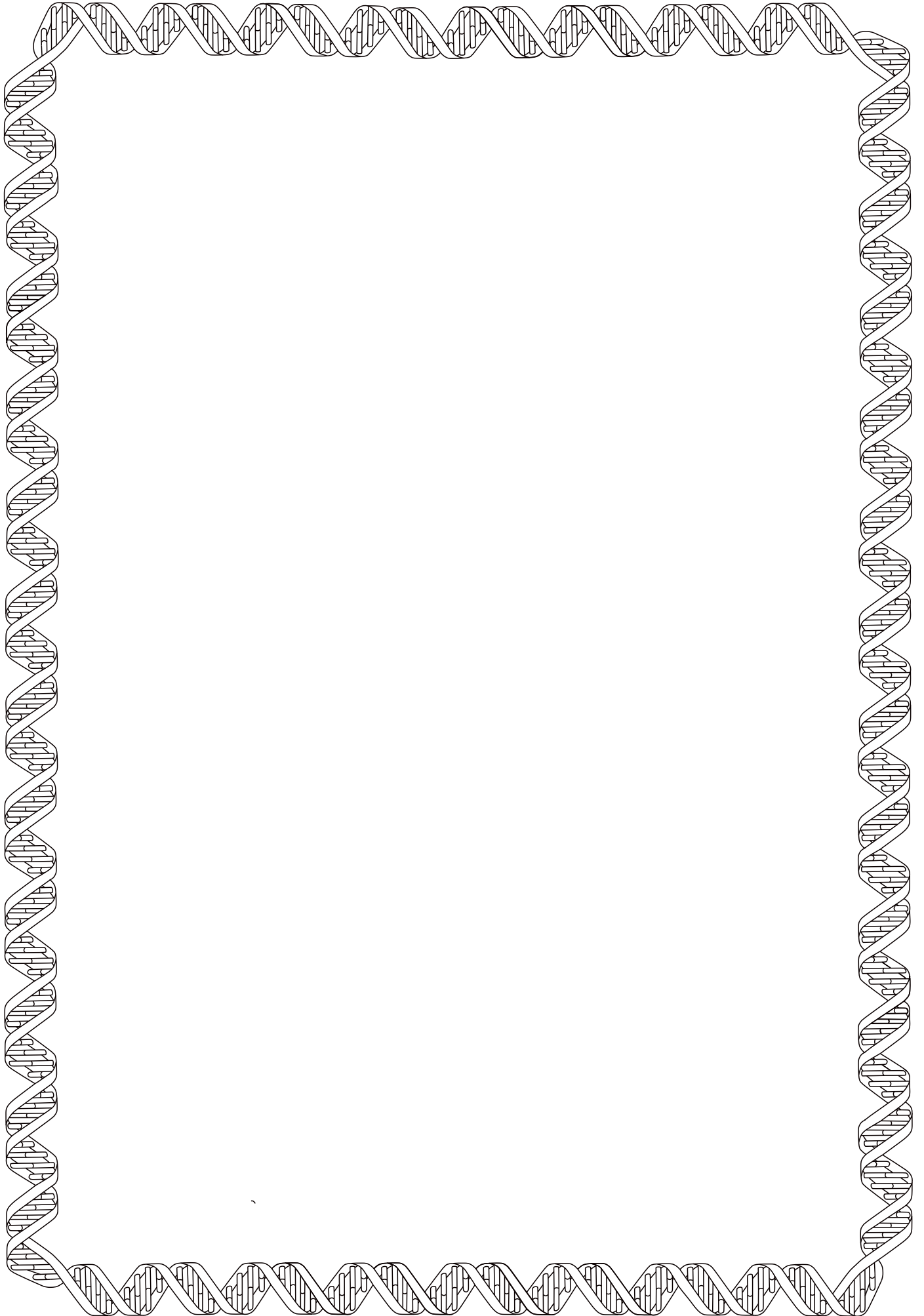
Yamaiya shuar fabrica matsakmaunam pujuiña auna microbiomarinka ujumak aruiñawai, tuma asa, sunkuran tukumi shir senchi jaiñawai.









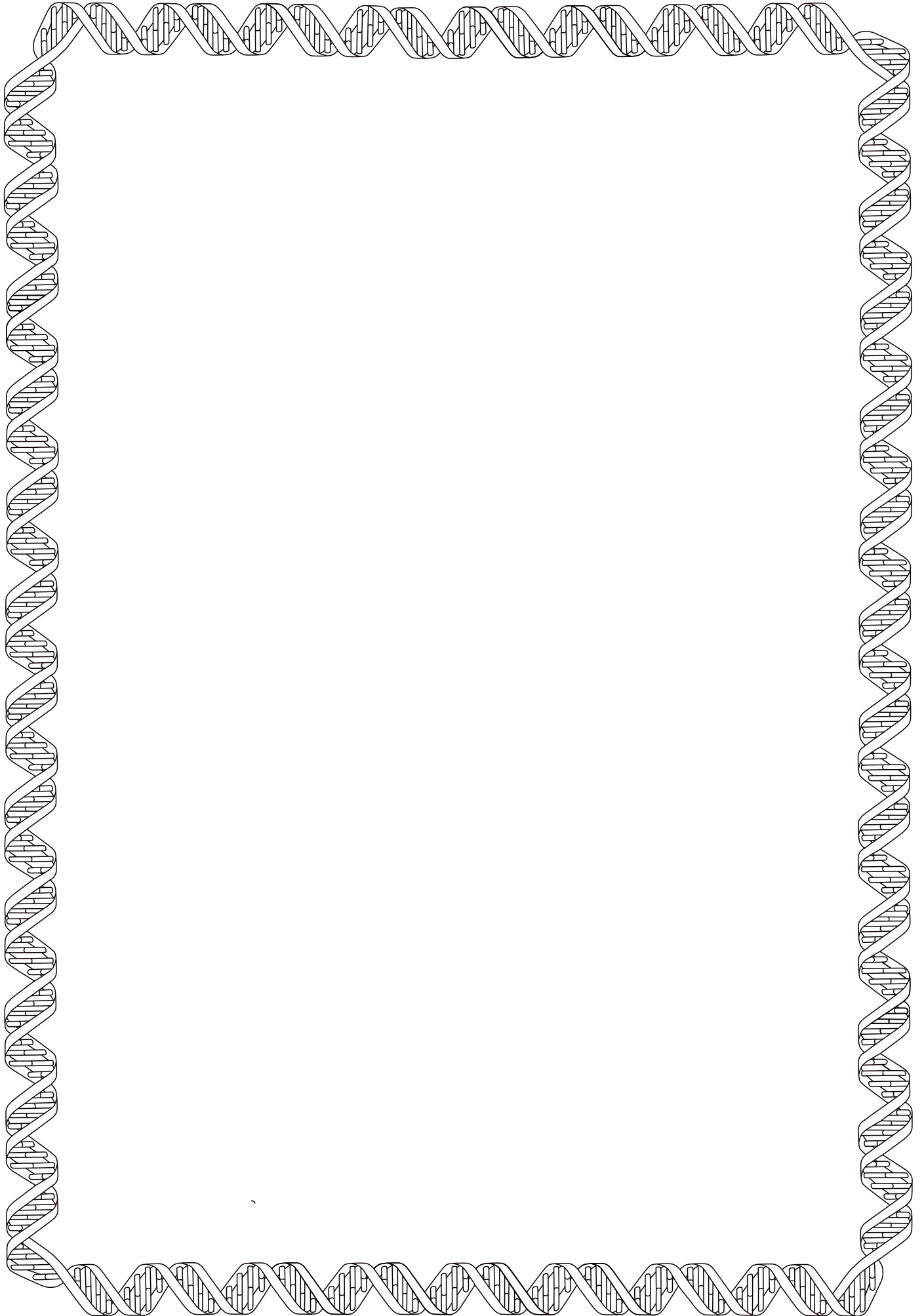






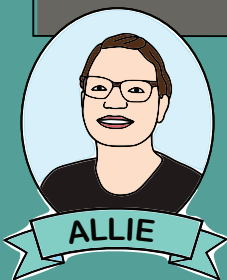




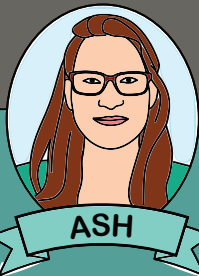




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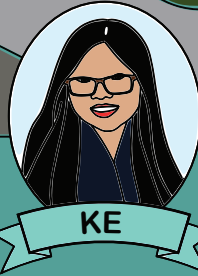
ALLIE



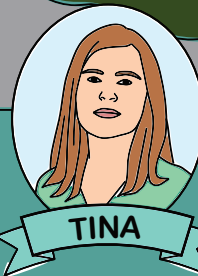
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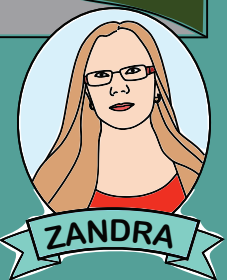
JESSIE



KE



TINA



ZANDRA

## Warasa wekamu

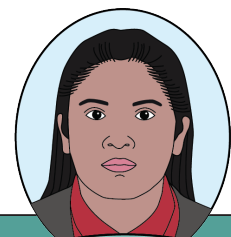
# CIENCIA ARQUEOLÓGICA AIÑA NUI Papi yakartin

¡Yaunchukia shuarsha urukuk armia tusa nekataj tamaunam arqueólogo aiña bioarqueólogojai tsaninkar uruk takaiña nu nekata!

Uyunkartusta tumakum nekata ya aiñaj tura uruk shuar najanakarukit nui nankamar peste medieval asauwa nuisha wari tishiprarsha aujaj. Yaunchukia shuarsha uruk yujajakarukit tura radiocarbonojaisha uruk nekataimpait. Nekata científico aiñasha uruk nekaiña arak yaunchuk takajakmau jijai wainmainchaun microscopiojai iischa. Yutai aiña muntsujai najanamusha uruk takasmauwait tura uruk kuntincha tankumtampait nusha ashi nekata. Yaunchukia shuara microbiomari nekarata yaunchukia sunkur tura jatasha nekaki weakum.

Ciencias de la Historia Humananmaya Instituto Max Plancknum científico takau junaka papinka aaruiti.

Dina Ananco wampis chichamnum iñankakmau.



DINA