

# PEQUE

Watu malhakiskina palh  
kgalhiputuna akgtúm robot



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**WA XTAPUTLEKGEN TUKU LHI LHAKGAPASKÁN**  
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Wa uma lhikgalhtokga tlan akgxilhkan xpalhakata putúm kgalhikan,  
kaxmanjua na walikan tiku tamakaxtulh chu niku tamakaxtunit.

Xlakata Sofía:  
Wix kin tsumát, Ihu tlan  
kimamakgatsiniya.





Wa papá'

Wa Peque chilh nak chiki niku taxtucha niku skuja xatlát, niku nak xkilhtín chiki xwe.

Xla nitu xpasanit chu xi pasá xsensores tsukulh lakaputsanán, wa xmotores tsukulh tatsujuí, tsukulh makawan rrr-rrr, tsukulh takgashmata bips-beps xi pasalh.

¡Nitu lakapaslhe! Kachuna katsí xlatamay niku skuja xatlát xi maskujukan, chu xla xlapasa pokgto malhakcha chu niku skuja xatlát, nachuna tuku xlihhtuja xi nitanks xlakaxtlunikan xsensor xpalakata ni nakgchakglha, niku tanulh xasasti chiki xwan ni xlhakgapasnan.

-Unuk wilha niku kgalhchiwinaw – wan xatlát-: katat wanilh, nak masiynian chiki lha uku nitiwilkgothalh. Xpalakata ni namaknijikgoyan.

Wa xatlát paks masiynilh pulhakne chiki. Ni lhu tlanka chiki xwan. Niku xlakí malakcha anda niku xaxtlukan taliwan, xla Peque kataxtulh kgapún.



Katsisne xwan chu xwe xakatla papá'.  
Xla Peque ni akgxilhle, xla tsukulh  
kgalhpatsanán, tlanchu nitu xwan  
xkgakganá nak kgapún.

Ximapasilh xcámara nak xa'akghekga  
akgxilhle. ¡Lhu nitu mapatsankgnilh!  
¡Nitu xtachuna xa'akgxilha, lhu tlan tasiu!

Wa xatlát anda makaxtakle Peque  
xpalakata nalhipasha tsasné.  
Wa xatlát xtúm tatulalh, lha  
katsilhiswa katsisní.



Wa kamón



Wa kin tlát tsino, tsino tamakanulh na chiki. Wa pulhna wa kin tsé lhu lhakgatsalh, xla xpuhuan pi “lhu tlhan xtasiyay”.

Ni xtachuna lhkaxtuya nak xcomputadora lha nakxilha lha xtakaxtlhaw.

Wa chu lhakchalh Ada, xla’akgkitsis kata kgalhí, lhu lakapala talhakatsuwilh Ada, xlamalhakanilh Peque. Wa Peque nitu lhanilh, tuku lhitahakspita lhu tlan takaxtlhunit, xla lakapala takilh, na nitu lhanima tuku lhikxilnhan nitu talhakpalhe, wa xpalakata nitu lhitakgasnokgma.

Xla Ada lhu tlan xakgxilha, lhu lhakgapaxaway xakgxilha, wa Peque ni xakgatesa tlhanchu xwilhkgolh karsiano tiku naxtachuna xli’aktsu lha xla.

Wa Ada lhu tlan tsumát xlikatsiy, xnitiya xla tsukulh klhichiwinan xpipilekg puskát, tiku lha tatlhukgoy, tiku lhitaxtuy laklhkaminá, lhaktsumatnin chu tiku lhuwa talakapástakni kgalhekgoy.

**Wa Alan lhu aktsukgo xwan, nina xlhai tlhawan, lhu ukú xtlakgilhanan. Katlakgilhanalh lakchalh Peque, xlna tsukulh lhixamay xmakan, xitakatsilh wa Peque pokgto nakx makgne xkalí xkgalhiwat skgata, wa Peque xlhakgatsankgoy.**

**Xnitiya wa Peque lhu kgalhakgatilh kamán, xlawá pi punchuna na kamakgtakgalha kamán xpalakata nitu nakakgspulhaí. Wa uma wax taskujut tuku lhi tlukgalh Peque.**



Wa chichí

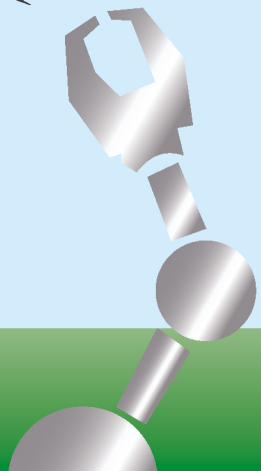
Wa kamán stakgolh, xlhakan lhu xkgalhiputankgoy tiku lhakgatsaputungkoy. Ni wapuntún pi wa Peque nix lhakgatsakgoy, xla Peque na kini karsiano xakgxilhkgoy.

Makgtúm kalhinikalh tantúm chichí wanikan Maktsakat. Wa kamán chuna walhinkgolh xtakune xpalakata xi chilh chichí punchuna kgosa chu xlikgamanan niku xtajuy. Wa chichí kini maktsakat chixit xtasí.

Wa Peque masiynilh Maktsakat katuwa lhitlawat. Masiynilh tlantla kgosnankgan nak xpulhakne chiki xi niti wilhkgokgalh. Na chuna masiynilh tlantla kgamankgan tatsekkan chu "kistalhnipí ". Na chuna masiynilh tlantla kamaktakgalhkan kamán.

Xi staklhe Maktsakat,tlak tlhanka wa lha Peque chu kamán niti katalhakatsuwinilh xixankgoy nak tije xpalakata xtun xtankgoy xchichíkan.

Wa Peque lhu tlan xmakgatsiy wa xpalakata tiku xmasiynima





Tuku  
punchuna  
tlhuya.

Xi lhakchan kilhtamakú agnajatsa lha katsisne wa Peque pasá. Takgalhxtuy niku takgalhnuy xpalakata na lhatanuy nak chiki.

K'akgxilha pi wa malhakcha tanks lhakchaway, na chuna niku talhakaxtukan tanks talhakchaway, na chuna tuku makgtakgalha chiki wa sensores chu tuku lhita akgxilha chiki wa cámaras xlhakgapún.

Uma tsukuy akgxilha niku kaxtlukan taliwan, akgxilha pi pokgto we niku xlitulak, chu pulhkuyat na akgxilha pi pokgto mixnannik. Na akgxilha niku kgalhchiwinkgoy, na chuna akgxilha niku skuja xatsé. Wa Peque na akgxilha pi tanks talakchunik niku talhakaxtukan xla akgstin, ti tlawan niku lhtatakgoy xanatláthin, chu akgxilha kgalhpajan chu niku lhtatakgoy kamán. Wa uma tuku tlaway kini akgkáv minutos lhi makgapalhay.





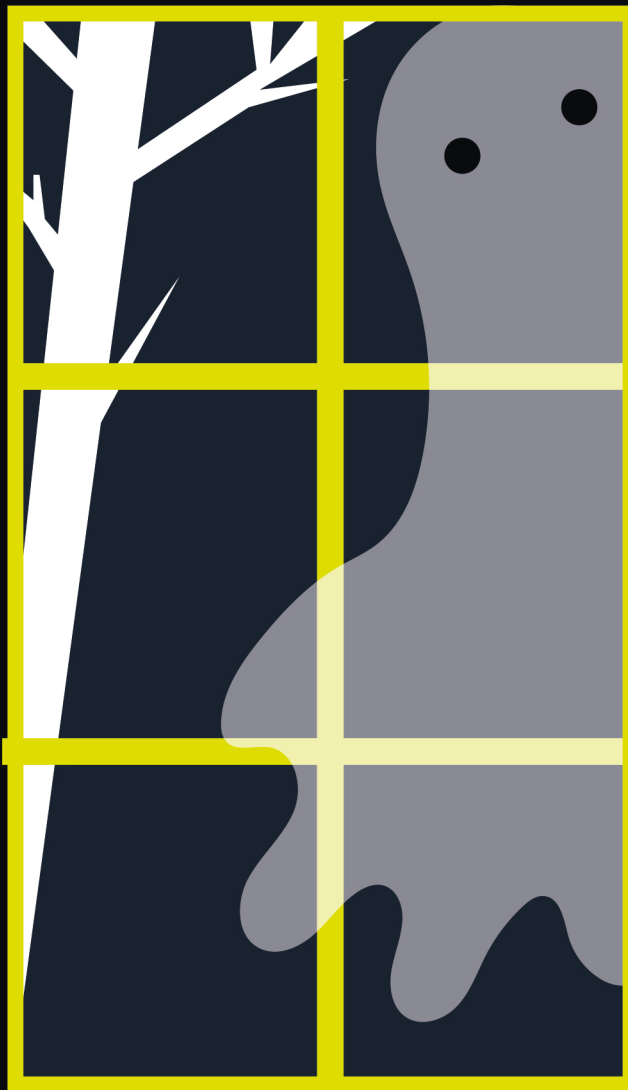
WaPequextumkatatulhaykamán  
xpalakata nitu nalanekgoy.

Katsiyaw pi xi kamakgtakgalha  
kamán lha katsisní lhu  
lhlhtataputu. Wa xlaPeque ni  
chuna xlha puwan, xlaPeque  
lhu lhakgatiy xtaskujut,  
katsisní katatulhay kamán  
kamakgtakgalha.

Lhagachinin wa kamán takikgoy  
lha katsisní, xlaPeque kata'an  
nak kgalhpajan chu kata'an  
kgotnakgoy. Xi tapuspitkgoy  
kamán nak xputamakan wa  
Peque kgamakgtakgalha, wa  
punchuna kata'an

Xlhakan kamán ni pekgwankgoy  
katsisní.

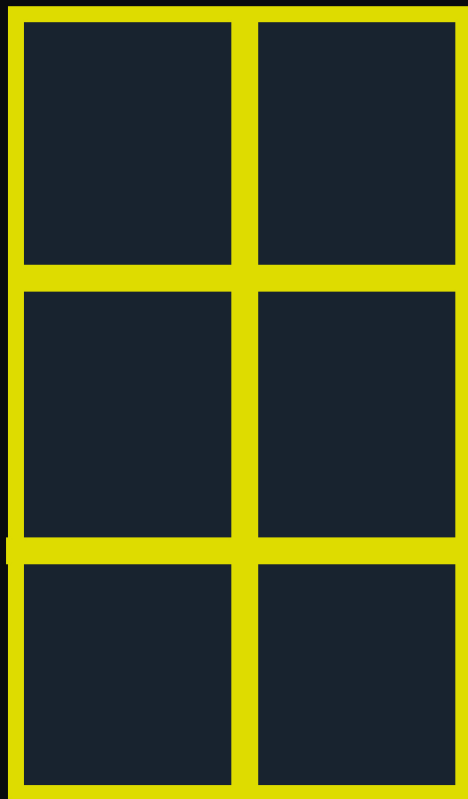
Nak xpulhakne  
chiki



Lha makgtúm lhu xjilhima chaxlha Peque xhatanuma nak chiki, xakgxilhma pi pokgto tlan xwe.

-¡Kuenta katlawá! -Xla akgxilhe pi wendo tatsujilh xhakatin niku talhakaxtukan. Xlha mapisilh tuku lhi akgxilhnan lha katsisní wax cámará.

-Kawa tuku lhi lhakgatlhapankgan tatsujilh xpalakata kax unama.-Chatúm skgalhna robot PQ06 ni xhipekuat, uma robot lhu ni xpekuan. Wakamánxlhitakagalhchiwinkgonit tuku xlanit xapulhna tuku makgalhanan, xla xmakpekuama.

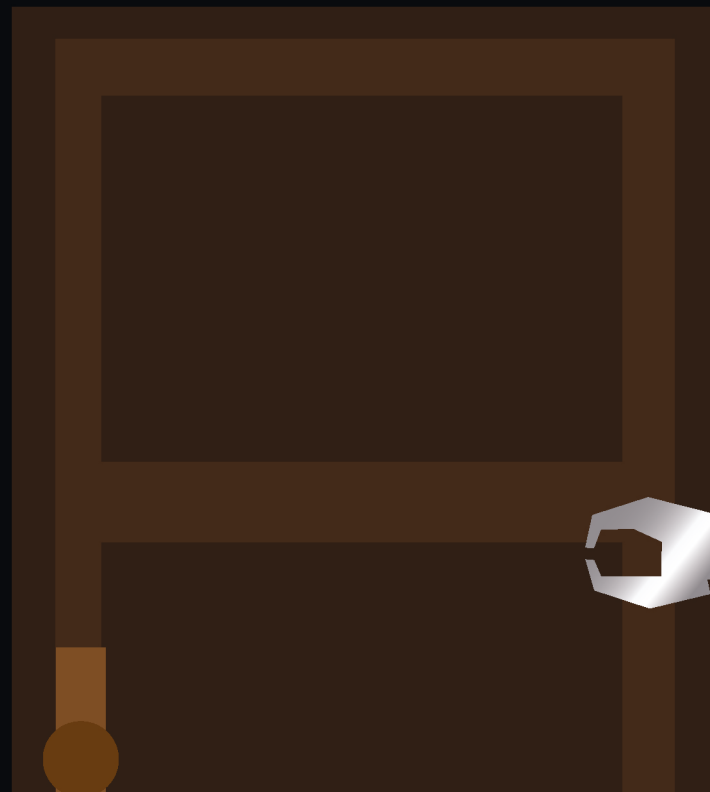


Ni makgtúm chuna na lhapalhay.

¿Tuku uma? - Xla Peque akgxilhe pi wendo xwe nak xmakgacha. Pi kawa xwan xmakgaxkgana xa'akgxilhñit.

-¿Cha uma tuku? -Kawa xmakuma tuku lhitlhawan, xlakaskinkga pi na walhinkan xachuchut tuku nalh nalhimakawan.

- Wa nitlan un ni lhatamakgoy. ¡Katlupalhaw ki taskujutkan!



Niku kaxtlukan  
taliwan



Makgtúm katsisní wa xsensores niku kaxtlukan taliwan makatsinilh Peque pi wendo xtatsujuima.

Xi chalh niku kaxtlukan taliwan lhakgatextlhe tantúm tsiya.

Wa Peque ni makgtúm xakgxilha tsiya, ni xlhakgapasa, kaxmanjua xlhakgapasa chichí, xlha tsukulh akgxilha.

Xlha tsiya ni makgtúm xakgxilha robots, wa tsiya talhakatsuwilh lha xya Peque, tsukulh kgakgawanan.

-Snif, snif -xtakgaxmata lha xkgakgawanama tsiya, wax xkgalhchixit xtatsujuí lha xtatsujuíma xkankán.

- Bzz, bzz -chuna makawa Peque, wax lhakgastapu xakgxilhñit tsiya.





Xlhakan xla lhakgapasmakgolh. Wa tsiya wa “skgalhen”. Nitu chawinama wax xpalakata wa tsiya ni chawinkgoy, xla wa skgalhen xi tsukulh slipí xlakán Peque.

Wa Peque ni kgalhí lakán, wa xla tsiya anda tsukulh xamay niku lhi akgxilha wax cámaras. Wa Peque ni lhu xchawiman, xla Peque na wanilh skgalhen xlha mapisilh xmaksgot lhu tipalhuwa xtasiy, lhimaninit.

Wa Peque chu tsiya lhakalhitsenkgoih, xnitiya lhu tlan lhatalhalhenkgoih.



Ni tlan  
tuku lalh



¡Tuku lalh,wa Peque lhakxihalh!. Wa kamán tunkun katsekgolh pi Peque xlhakshlhanit, xpalakata nitu kagxilhe lha katsisní. Patsakgolh, teksgskgolh niku ta'uxkaní. Ni xmakawan lha lhakachinin xtlhuwaí. Ni xmapasiy xalhakatin xmakgskgot, ni xmitsujuí xantenas, ni xmakawan xmotores.

Wa xatlát lhílh niku kaxtlhukan chu lha ukú tlhawalh kilhtamaku. Wa Alan xkgalhskininan xi kitapuspita niku kgalhtogakgan chu Ada lhiní kalleta xí'an akxilha niku kaxtlhukan, wa Ada manwaí xakalleta.

Wa Alan lhu tlanka xmalhakí xlagastapu chu xkgalhskininan: "¿Wa uma xakskitit? ¿A tlan wix tlawaya pi nachiwinan? ¿Tlan wix tlawaya pi nakgosa? ¿palh nak maxkiyan tuku lhi kgamanan a namatlhaniy?"



Xla Ada xwaniy xtlát tlantla tlan xkaxtlaway: xlihi xkgakganá staku, xlihi patasunat yu'ún, o wa tuku matanpilhí xkgamanan kin tala. Wa xatlát xkgaxmata chu xkawaní pi xkgalkgalhima akgtúm refacción tuku ni tlan taxtunilh, xla kawanilh pi xi nakgalhí xla Peque kini xasasti nawan.

Xla Ada xpastaka pi kachuna xwan xtlát xpalakata xlihi makgtsija xtala. Tsino xkgalhxtakga, xtsukupalhai chiwinan xwaniy xtlát tlantla tlan xkaxtlukan Peque.

Akgkáv kiltamakú kgalkgalhekgoih.

Wa refacción chilh, wa akgtúm chip tuku lhi skuja, uma wa xatlát nitu xkgalhí niku makí xdispositivos electrónicos, wa makgtayal Ada kaxtlaukgoih Peque, wa Ada tlan xlhakaskin cautín. Makgalhnokgoih Peque tlaka tlan napasay.

Xnitiya wa xatsé katsisní kamalhtatilh xpalakata tlan xwanikgoy tlantla makgtaykgoih, Peque xpalakata tlan xwanpalhai.

Wa tlajana



Nixakanalhai, watlajananiakgtúmmetroxlhitlanka kgalhekgoy. Lha ukú wa tlajana lhtawanamakgolh niku talhakaxtukan niku kgalhchiwinkan. ¡Lhu lhaktlanka chu lhu makgchixiwa umakgolh tlajana!

¡Ni xakanalhai! Xpalakata we tuku tlan xtlukan. Wa Peque ni xlakaskin pi wa tlajana we tuku xkatluniy tiku xkalhakgatsan. ¡Wa tiku xkapaxkí!. Ni palh wa chichí tlan xkatatlankgalin, chu talhman lhtatamakgolh kaman.

PQ06 wa akgtúm robot tiku skgalhnan. Palh we tuku makawan nak xpulhakne chiki tankun an, lhin tuku makgtayay, xnitiya pastaka tuku tlan natlaway: palh tlan xakstu lhakaxtlhaway o palh lhakaskin tamakgtay. Xlha nitu xlin xlhikan tuku maskujuy xpalakata xla ni xkuinta tlawana´kachikín o palh militar.

Wa xanatlatnin lhakgawitekgolh xi akgxilkgolh tlajana, lhaka wa Peque ni lhai skin tamakgtay, wa Peque kgaxmatlhe pi chatúm kamán lhakgastakgwanalh, taktacha chu tsukulh kgalhskininan tuku xmakuma.

Wa Peque lhu akgtso xla nitu mapekuaníy, wa Peque tsukulh palha makawan xpalakata wa tlajana kuenta tlhunekgoy. Wa tlajana ni kuenta tlhunekgolh Peque, xlhakan tsukukgolh tukukgoy, wa Peque kalhaktanulh tsukulh katatlhaway lha xlihi makgatliwekga.

Wa kamán lhtatamakgolh nakxputamakan. Chatúm kamán xlhakalhítsinít xpalakata nak xtamanxnít wa Peque xkgamakgatlanjánít lhaktlhanka tlajana. ¡Xla wa tiku xkamakgtayay!

Ni tlewekge  
tamakgatsiy



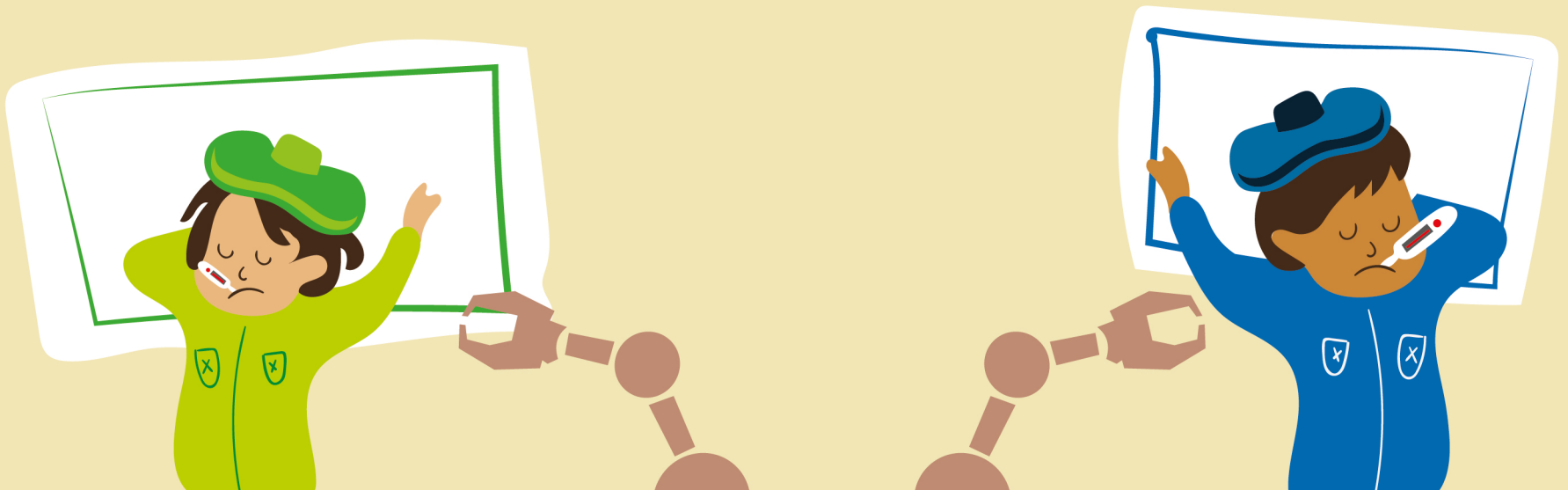
Wa Peque nitu xakilhai niku xtakgalhnuy xpalakata ni namixa, wa xpalakata lhakatsu xkatatulhputum kaman.

Xchatiykan tatlakgoy, akgkatsankgoy, ni tlan makgatsekgoy chu lhu taxtlhajuanikgonit, wa xatsé lhakaskilh pi tlan na tulhkgoy nak chiki.

Wa xatsé tsukulh skuja wanilh Peque pi kamakgtakgalha kamán, palh we tuku lhakaskinkgoy na makatsiniy xatsé. Uma xlhakaskinka xpalakata ni lhu tlhanka xwan chiki, wa xatsé akgxilhnit Peque pi kanilhakatum tulhai (ni takatsiy palh chuna lhaklhai robot) wa xpalakata matlhawimakalh uma taskujut.

Wa Peque lhu tlan tlaway tuku matlawikan chu lhu paxaway.

Xla Peque xlhakatin xputamakan kamán xtaynit, wax sensores xmakgatsiy xmakgnikan, xjaxanatkan, uma xlhin xkilhtamakú 5.47 minutos.



Xpalakata pi nalhtatakgoy kamán xlha katlinilh.  
Katsiyaw pi wa Peque ni lhiy tliy, wa  
mamakawnilh xmotores uma tlhaway pi wa  
kamán lhtatakgoih.

Chu xla na akglhtatayalh. Xla kasputnilh tuku  
matliwekglha chu xlha ni pokgto mixa xpalakata  
ni natsankgay xakskitit.

Kalhakapala lhakgastakwanalh, xla xkgalhí  
puxamakáw matliwekgé. ¡Anda we niku  
takgalhnuy niku matlhiweklha, ni wa katawe  
kamán!

Tankun xanputúm niku tamakgoy kamán, wa  
xatlát machokgoih: -Katakatste, xlanan tlan  
wilhkgolh. Tlaktlan wilhkgolh. Xlakaskinkga wix  
unuk natulhaya xpalakata tanks natakgalhnuya  
natamakgtliwakglha xpalakata ni nalhakxlhaya  
lha makgtúm akgsapuln.

Wa Peque tapuspita niku takgalnuy. Maski sitsiy  
xla lhakgachixkuinan.

¡Xla lhu tlhakwanit!



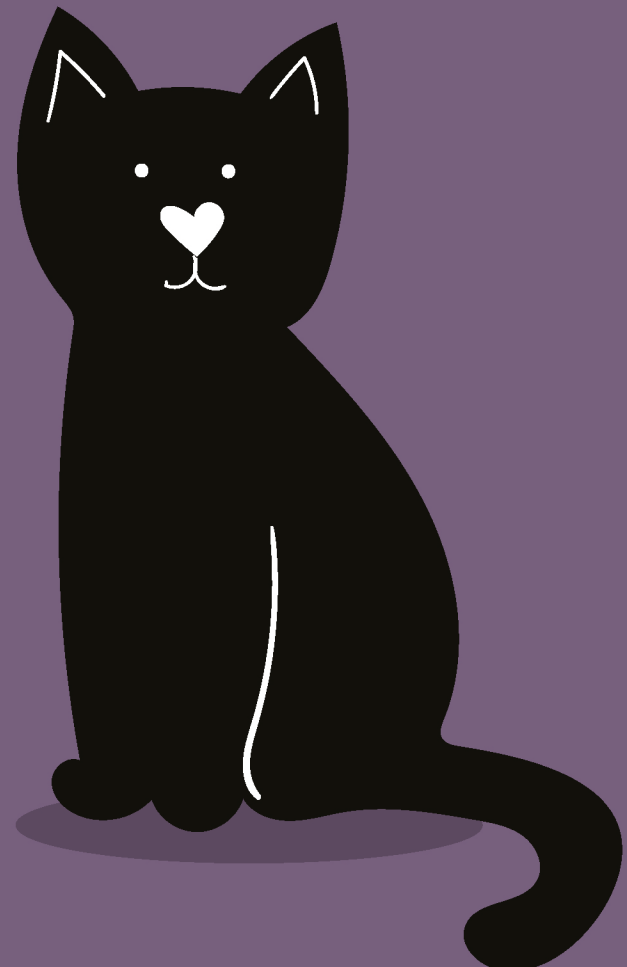
Tuku uma

Katuwa tuku lanilh Peque lha katsisne, wa xpalakata pi xla xipasay.

¿Wix pastaka pi wa Peque ka'akgxilha niku talhakaxtukan? Xnitiya niku talhakaxtukan ni xlhakchaway. Xnitiya xla tlanka tlawalh tuku lhimatsujuí xmakasiyan, chu xmakasiyan lhi makgalhxpitle tuku lhi malhakchukan. Wa xsensores wento makgatsilh.

Ni wa xwan tiku tlantalhalin wa tsiya, tankun makgatsilh pi tlanka, ni xtachuna lha chichí. Lhu palha xtatsujuí, ni xmakawan. Tanulh niku kaxtlukan talhiwan, xla Peque tustalhnilh. Kini xkgakgana, xtasí pi we tuku xpsatsama.

¡Akgxilhe! Pi wax takgán lhu spinkijua, kasnapapa chu tsitsakg xmakgwan, pi wa xwe tamtúm mitsi, wa xpsatsama tiku takgamanan Peque, wa tsiya.





Xixla mitsi xkgankgawanama lhakatsu nixwe xmasakat tsiya, wa Peque lhatsuku talhakatsuwinilh xpalakata ni na kgaxmata. Xla ni makawa maxtulah xmakasiyan tuku lhichapalh xtastajan mitsi.

¡Tuku lhalh! Wa mitsi kgoshe wa lhilhai pi pekua. Wa mitsi lhilh Peque walhilai pi tanchapanit, xla Peque kaniwa tamakgwakama, lhu lhapekua makumakgolh pokgto kamalhakstakwanikgolh. Pi pokgto makgankgolh puway chu niku walhikan tamanin, chu xi xatsé malhikilh malhakcha wa mitsi kgoshe na titiyalh tuku lhikaxtlawankan.

Xi pokgto xankgokganit tamakgoy wa Peque alh patsay tsiya, niku xwe nak xmasakat. Wa tsiya wanilh ¡paxtakatsinalh! lhi tokglhe xkgalhchixit, wa xla xsensores Peque xmakgatsekgox xnakú tsiya pipalha xtlawama walhilhí lhu xpekuanit. Wa tiku talhalhin Peque nitu lhanima, tlan xwe wa makgtayalh.

Skgalhen  
kin tsé

Putúm tasakgoy nak chiki.

Wa kamán stakgonit tsino chu xlanan tlak akgateskgoy, xla xatsé lhu tatlai.

Xla Peque ni lhu akgateksa. Maske wa Alan tlhak lhakgaxtluwah xlihi talhakgapastakne wanikan inteligencia artificial, ni lhu lhai akgatesa tuku lhama. Wa Peque makgnijí akgxilha pi pokgto lhipunkgoy.

Kalhakapalha pokgto kalhxtakgoy chu xliha Ada lhin Peque niku wey xtsé, tiku lhu tlakwanit tasiyay.

Ni lhu takgaxmata wanilh skgalhen, chu Peque tiku na tlhan chiwinan, xlihi paxtakatsinat Ada tiku tlan kaxtlhuwalh, xla Peque wa “skgalhen kin tsé”.

Alh kilhtamakú wa tsé nilh lha uku pokgto tasamakgolh. Xla Peque ni matainiy talhipuwan, xla patsakgay na’án niku takgalhnuy xlakata tlan na tlawan.

Xla Peque misha. Makgas an kilhtamakú ni pasay.



Kin tlát ni  
lhai lhtatai



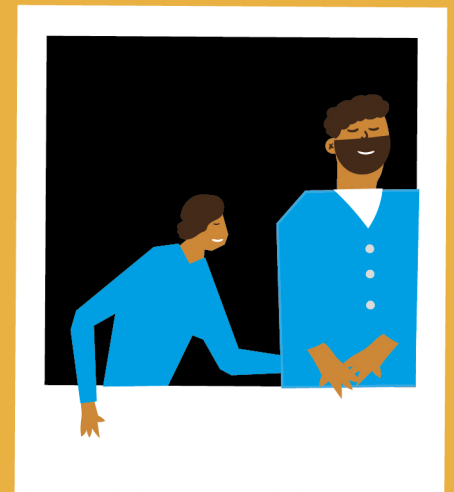
Lhagachinin ni lhai lhtatakan. Wax Tlát kamán lhakpichiwalhtatai, xi xla makapatsanan nakx putaskujut teksa akgtúm xamakgana tamakaxtun fotografía. Pastaka wa PQ00, akgtúm robot makgatsina, wanpuntun pi ni wa stalhní tuku lhakaxtlukgonit nak xa akskitit lha xlha xmicroprocesador PQ06, lha Peque.

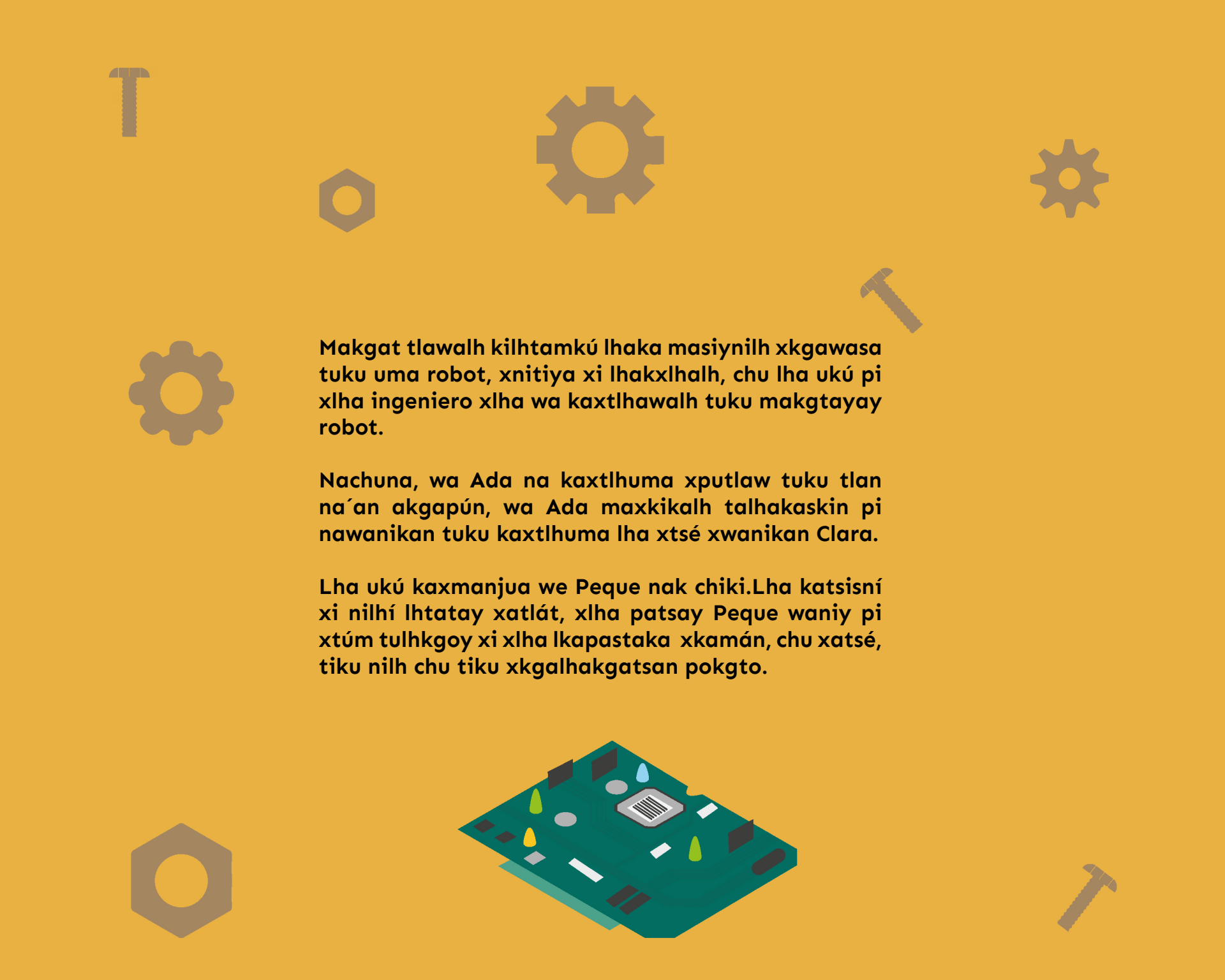
Xla PQ05 xkgalhi takaxtlhu lha wa xsemiconductores tuku xlhitaxtukgoy xneuronas, tuku xmakgtayay pi tlan xtalakatsuwiníy makgskgot, na tuku xmakgtayay pi tlan xli tlawan xi tsoknikan xtije nak tiyat. Wax tipalhuwa makgskgot xmasiy palh tlan xpatsakan niku nalhaktlawan wa xatatsokgne tije, nachuna palh lhuwa o akgtusu xkgakgana xmastokgnit. Wa xlha Peque tlan taxtulh wa lhilhi kgalhi inteligencia artificial.

Anit kilhtamakú 25 kata titaxtulh, xnitiya wa aktsu Alan kaxtakgamanan robot, lha ukú wa Alan makgatayalh xtlát kaxtlhuwalh Peque, tuku xlhaxlhanit wa xceldas neurales.

Niti xkatsiy tuku xpalakata lhaxlalh, lhu tuwa kaxtlukalh, xpalakata pi xlhakpalhinkgoy xceldas neurales, palh xasaste xwalhinekgoy uma tlhaway pi akgtúm chu tanunk robot nawan, nalh wa Peque tiku xlhakgapaskgoy xwan. Tiku “mixlhe” xi tatlhalh xatsé.

Xlhakaskinga tlhukan akgtúm xasastí tuku lhikaxtlhukan Peque, wa uma tuku lhikaxtlhukan tuku lhuwa lhilhakgnuy Peque, ka’akgatunu, akgatunu, akgatunu kaxtlhukan, napatsakan nima lhaxlhanit chu wa lhi kaxtlhukan wa “microcirugía”.

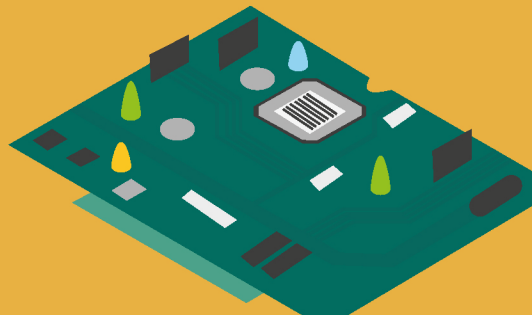




Makgat tlawalh kilhtamkú lhaka masiynilh xkgawasa  
tuku uma robot, xnitiya xi lhakxlhalh, chu lha ukú pi  
xlha ingeniero xlha wa kaxtlhawalh tuku makgtayay  
robot.

Nachuna, wa Ada na kaxtlhuma xputlaw tuku tlan  
na'an akgapún, wa Ada maxxikalh talhakaskin pi  
nawanikan tuku kaxtlhuma lha xtsé xwanikan Clara.

Lha ukú kaxmanjua we Peque nak chiki. Lha katsisní  
xi nilhí lhtatay xatlát, xlha patsay Peque waniy pi  
xtúm tulhkgoy xi xlha lkapastaka xkamán, chu xatsé,  
tiku nilh chu tiku xkgalhakgatsan pokgto.



## Tuku mi lhi katsit

Wa kamán chuna kawanikan xpalakata pi chatiy tiku malhakatsukgolh wa inteligencia artificial. Ada, wa xpalaka Ada Lovelace, tiku xapulhna tsokglhe xprograma nak computadora ;xi nitu xwan! Chu Alan, wa xpalaka Alan Turing, tiku wa tlantlha tlan lhiskujkan akgtúm inteligencia artificial, makgasa anit kiltamakú. Wa xatlát wanikan Noé, chu xpuskat wanikan Clara.

Xla ingeniero mecatrónico, chu xla diseñadora industrial.



Tuku wix tlan  
na tlhawayaya

# Xli akgtúm tatlhaw Katlawá wa mi robot.

¿Tlantla wix pastaka xpi xwan Peque? Katlawá akgtúm robot lha Peque xwan.  
Nachuna katsokgte tuku tlan tlhaway wa mi robot.

# Xli akgtí tatlhaw ¡Makasiyan!

Lha ukú na tlhawyaw akgtúm makasiyan tuku nakgalhí akgtutu xalhaktsu xmakasiyan. Uma makasiyan xtachuna taseykgoy lha lhikgaman tuku patsay chu kachapay wa xalhekgaman xalhakgat chu uma makasiyan ka makgaxtakga niku tlan lhaktaxtuy xpalakata tlan wix na chapaya.

Lhagachinin wa uma makasiyan xmake wankgoy robots.

**¡TAKS KA'AKGATESKGTE!:** xlakata tlan wix natlhawaya uma makasiyan tuku tlan katuwa chapay, xamakgtúm wix na xkina tamakgtay tiku tlhanka karsiano,xpalakata na chukuxtunan.

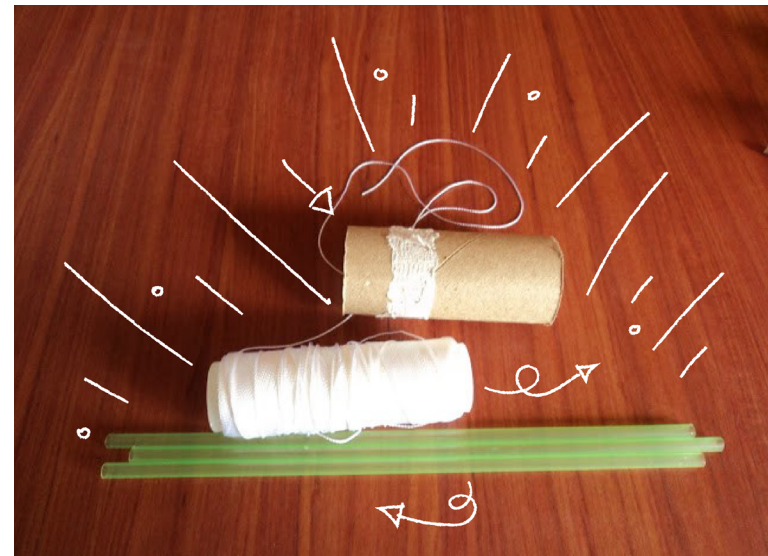
**Kapastakte pi wix tamakgtakgalha, nitu nalhani'an.**

**Tuku wix nalhakaskina:**

- Akgtutu popotes
- Hílaza wa cañamo (lhiukay akgtúm metro) xlhakaskinka akgtúm tsinit tuni taxkgata.
- Aktúm milhete xla carton (kit lhakaskilh watu lhitakgachinit kasnap higiénico).
- Akgtúm lhishlam xtalhanjua.

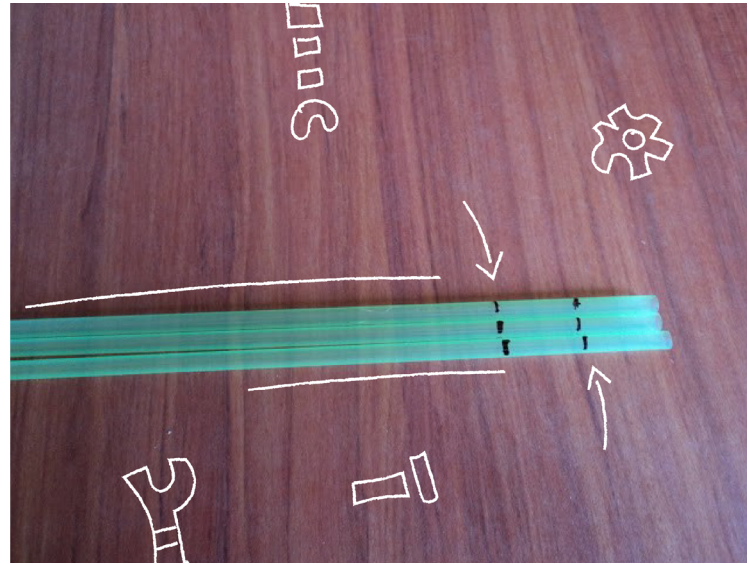
**Tuku wix namakglhakaskina:**

- Tuku wix lhi lhakchukuxtuna(Tijeras).
- Tuku wix lhi tsoknana (marcador).



## Akgtúm Ihitlhawat

Makgtiy kalhkawilhe nak popotes, wa kalhakaskinte marcador. Wa kalhikat xlha'akgtsu mi makan, lha lhikilhtsukuy popote kawalhi akgtí xalhaktsu mi makán chu kalhkat, amakgtúm chuna katlhupalha lha lhkante.

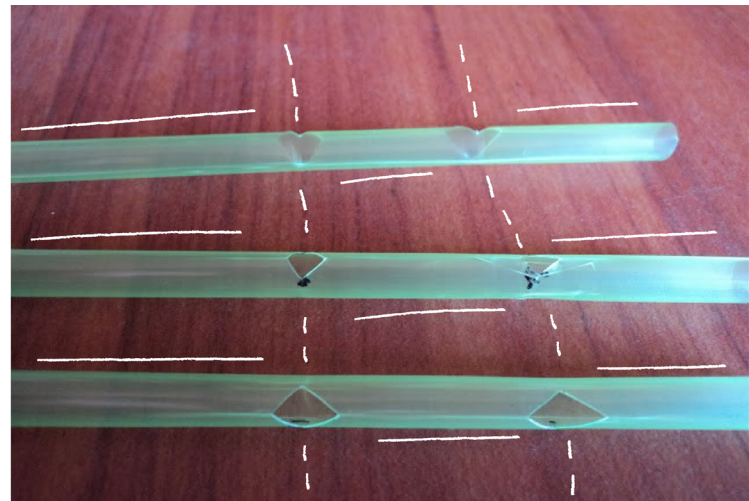


## Akgtí Ihitlhawat

Akgtí Ihitlhawat

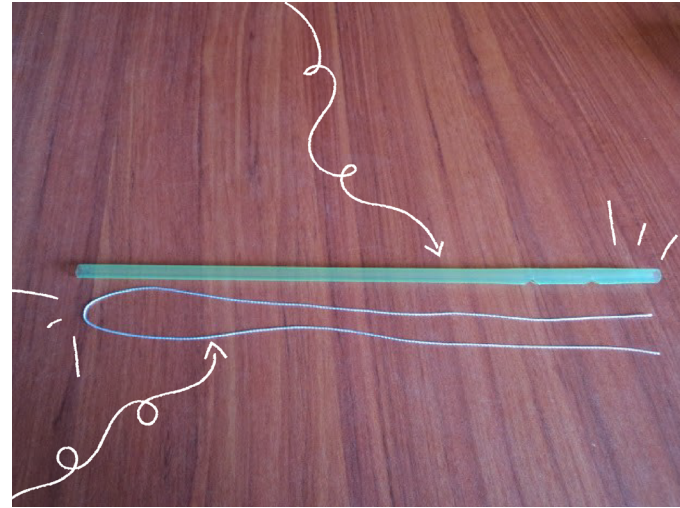
Kachukú wa popote niku lhkat, ka'akgxilhate lha tasí unik. Pokgto xpujua na kachukuya.

Ka'akgxilhate numa taxtunian lha tuku chukuya.



## Akgtutu Ihitlhawat

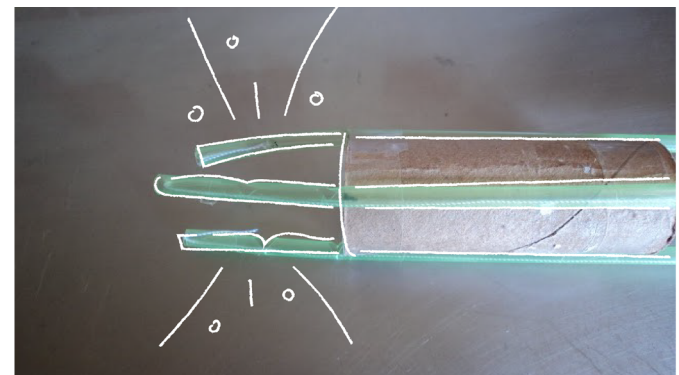
Ka chuku tsinit makgtiy xli lhman popote chu katamakanu nak popote. Kin lhakgatekgswe tlantla tlhukan, akgtiy lhakgatekgswe tlantla wix natlhawaya: wa tsinit natamakanuya xlhikilhtsukun popote, lhakatsuku, lhakatsuku natamakanuya, na tlan natamakanuya tsinit xli lihtsukun popote chu xli kgalhspitut popote tsukuya tsutsutiya tsinit (kuenta na tlawaya ni nakgotwaya tsinit).



Niku taxtuyacha tsinit, anta niku lhukun popote tanks spujua naslhamaya tsinit.

## Akgtati Ihitlhawat

Lha ukú kakaslhama popotes nak tambilhe xliha carton, kuenta natlawaya niku lhukungkoy popotes anta nalhakankgoy nak xpuytad tambilhe carton, wa popotes tanks na kastlhamaya chu nalhkayawya lha kaslhamyawya, xpalakata spujua nataykgoy.





¡Makgalhspuw!. Lha ukú tlan  
nalhitsatsayaw.Ka´akgxilte tlantla  
tatsujuí xalhaktsu makasiyan xi  
lhtankan tsinit.

Lha ukú tlan natsokga, namaniya  
wa mi makasiyan xpalakata lhu  
tlan natsiy, chu kakapatsa mi  
lhekaman extraterrestres chu  
kawande lha wan nak Toy Story:

¡Wa makasiyan.uh uh!

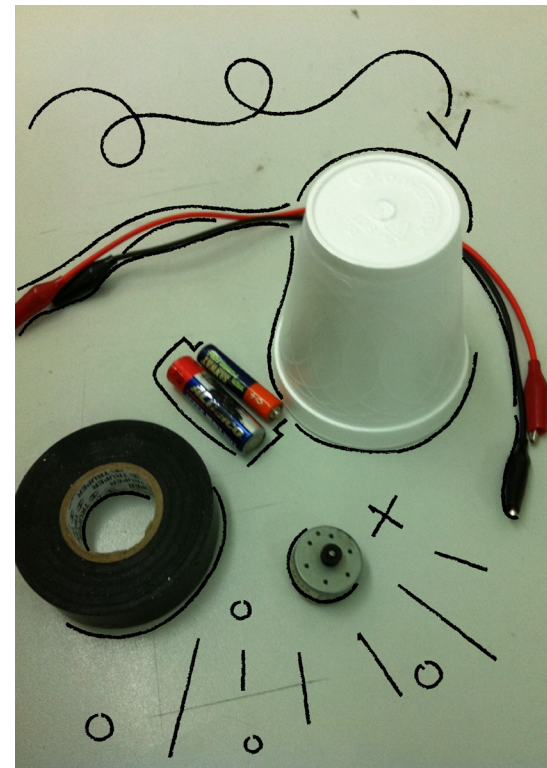


# Lhitlawat akgtutu. Wa vasobot

Lha ukú natlawyaw akgtúm robot tiku tatsujuí, namakawan chu namaninan.  
Tuku lhakaskina:

- Akgtúm vaso pushmulho
- Akgtúm lhislham
- Akgtí caimanes
- Akgtúm motor DC (tlan na tekgsa nak putlaw tuku lhikgamanak, tuku nalhtlan.
- Akgtúm o akgtí baterías.
- Akgtutu tuku lhitsokgnana, watiya xlihi lhman.
- Tuku wix na lhakaskina wa tuku lhi chukunkan chu silicón.

Kapastakte pi wa tuku tlan lhitulhia xlhakaskinga: palh wix nalhakaskina niku machichikan silicón, kuenta natlawaya ni namamakachiyan, xa tlan kawani tiku karsiano xatlanka pi na makgtayayan



## Akgtúm Ihitlhawat

Wa motor DC (corriente directa), wa motorcito tuku lhakgatesa nak mi putlaw mi lhekaman, uma lhekaman kgalhekgoy palh baterías chu palh tatsujuekgoy.

Palh wix kgalhiya mi lhekaman wantu nalh lhakaskina, palh lhakxlhanik, kawani mi tlát palh tlan malhakgxtuya, kuenta na tlawaya, (ni kalhaktuxpiya, makgapitsi tlan lhakaskinkgan).

Tlan masiyniya uma likgalhtowakga na chuna tlan nawaniya pi wix pastakpat mecatrónica (lha tlát Peque) chu wix natlawaya xli makgtum mi dispositivo electrodinámico biocontrolado. Lhakgajuy nak waniyan tuku uma wanputúm. Nak xtankashekg motor wix tlan nashtlhaniya palh lhikan o wa plástico, tuku wix na slhamaya ni xtachuna xlhitsinga. Wa uma tuku wix tlhawpat wanikikan tanunk.

Kinin tekgswe wantu tlan tasiy plástico chu wa ki motorkan numa taxtulh:



Watu wix akgxilha katsitsakga wa uma xtankashekg motor. Kuenta natlhawaya ni lhimitsamaya silicón niku lhukun mi motor.

## Akgtí lhitlhawat

Ka slhamawka lhitsokgna nak vaso tanks nalhkaya pokgto chuna tulhkgoy, chuna ka.tlhawa lha we unot nak lhikalhtowaka

Kit makgalhthawakgana kit wa walhinilh tuku lhitsokgnan nak pokgalhtowakga, palh wix wa lhakiskuputuna tu wix lhitsokgnana tlan wa lhakaskina palh wa plumón, pluma, lapiz wantu tsokgnakgowkgo.



## Akgtutu lhitlawat.

Kawalhe wa caimanes nak xkilhtun motor. Wa xkilhtun anda niku tachapay motor nak corriente eléctrica.





## Akgtate Ihitlawat

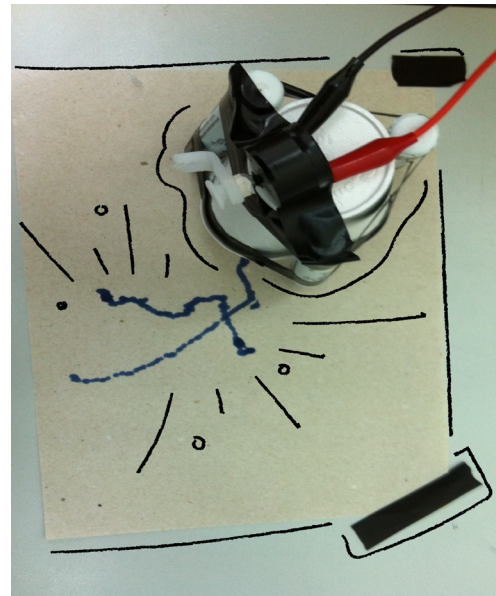
Kakaxwalhe wa mi motor xpalhakata wa excéntrico ni natokglha.

Xi wix tanks kaxtlhunita, tanks na shlanwalhiya, ni natachikiy.

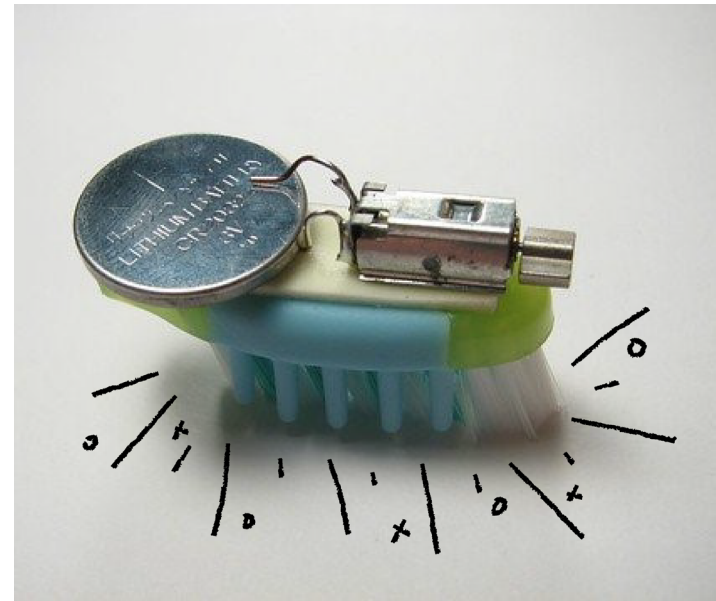


## Akgkitsis Ihitlawat

Lha uku wix tlan na makgalhxtuya lhitsokgne. Kawalhe vasobot nak kapsnat chu xlii ankgakgatum caimanes kamakgankgano nak baterías. Akgtúm anda na makgankganuya nak xkilhpin positivo chu nak xkilhpin negativo. ¡Wa uma natatsujui chuna makawan, na chuna namaninank!



Xi wix tlan akxilha pi tatsujui wix tlan na maniya chu tlan namasiyna mi tsé. Ka lha kapastakte pi uma akgtúm dispositivo electrodinámico biocontrolado. Uma electrodinámico xpalhakata wa lhii tasujui electricidad chu biocontrolado xpalhakata pi wix tiku matsujuiya, wix makgalhnuya nak batería. Na chuna wix na kaunu lhapak nak katiyatna, ¿o ni chuna?



## Tuku wix tlan na tlawaya:

Tlan palh wix natsokga tuku wix pastaka nak mi putsokgna. Wa uma putsokgna wanikan bitácora chu pokgto tiku we tuku tlhokgonit, wanti pastkgoy chu wanti lhakskujkgoy kgalhekgoy.

Palh tlan taxtunin chu palh tlakgtlan kaxtluputuna vasobot tlan wix natlawaya akgtúm cepillobot, tlan wix nawalhiya wa mi motor nak tuku wix lhakaskina tuku lhikgalhchakgana.

Nak internet wix natekgsa wa bristlebot, kawatiya katsino talhakpalhiy xpalhakata uma kalhaktsumotor chu baterías lhakiskin. Lhu lhaktsupi wix tlan nawalhiya ¡tuku lhikgalhchakgana! Ka'akgaxilhte watu kit kaxtlhuwalh.

# Takgalhskinin

Katuwa kgalhskinputunan wix tlan na kgalhtinnak xi na makglhakaskina wa mi vasobot.

- ¿Xla kaskinga pi wa vaso na wan cónico? ¿Tuku xpalakata chuna na wan?
- Palh wix nalhakpalhiya tlantlha kamalhakno wa mi caimanes nak bateria ¿tuku wix pastaka na lhai?
- ¿Tlantlha tlan nak malhaknuy akgtuy baterías lhaka tlan na tatsujuí wa vasobot?
- ¿Tuku wix pastaka na lhai palh na malhaknuya akgtuy batería nak vasobot?
- ¿Tlan wix xkalhxtuya xkgalhstilhilhi, wa na lhakaskina wa mi vasabot? ¿Palh wa tuku akgtati kgalhí xmakgacha chuna akgtutu kgalhí xmakgacha?
- ¿Wa uma tuku katalhakchikiy wa lhilhiy talhakaskima excéntrico anda talhakaskin nak videojuejos chu nak celulares? ¿Niku lhitum?

# Makgatanksaná

**Robot:** Uma lhi kan watu skuja, uma tlan xakstu tlawai tuku tlhuputan lha lhikastlhukanik. Xpalakata tlan na tlawai xtaskujut uma xlha kaskinkga na kgalhi tuku lhimakgatsi, tuku lhi skuja, tuku matlihiwakglha, chu tuku lhi pastaka. (Mocencahua 2007)

**Sensor:** Uma tuku lhimakgatsi, xtachuna lha kinin kgalhiyaw tuku lhimakgatsiyaw.

**Motor:** Uma lhi kan tuku skuja, uma lhi lhakaskinkgoy xpalhakata na matsujuí tunta, uma lhakaskin tuku matlihiwakglha, wa uma watu kgalhekoy putlhaw, chu makgapitsi tuku lhakaskinaw chale chale.

**Cámara:** Uma tuku tlan lhimashtuya tuku lhama, anta tlan lhi akgxilha tuku talkaitainit, xtachuna lha ki lhakgastapukan tlan akgxilha xkgakgana, manin, tlantla makgwan, xlhimakgat , tlantla we chu lha tatsujuí katuwa.

**Computadora:** Uma lhi kan tuku maskujukan, uma tlan makí, tlaway xmakglhakaskinga tachawín, talhakapastakne, tatsokgni chu tlan katuwa tlan tlaway, uma lhi skujna tlan makglhakaskina xi kgalhtokgaya chu palh walhinian taskujut tiku makgalhtokgayan, tlan wa makglhakaskina.

**Antena:** Uma wa xlhakaskinkga xpalakata tlan nachapay chu mashtuy tuku kamakgatesniy xkatuwa lhi kan watu lhakaskinaw, naxtachuna watu lhakiskenkoy wa matsayá lha tlan na lhtamakoy, kgakgawankoy, tuku tlan lhi waykgoy chu tuku lhikgaxmakgoy.

**Refacción:** Uma wa tuku tlan lhakaskinkgan xpalakata palh wa tuku maskujuya lhi kan lhakxlalh o palh lhakgwalh xpalhakata punchuna lhakaskina, uma xlhi lhakgpalhika.

**Chip:** Uma akgtu tuku lhakaskinkgan, uma kgalhi tuku malhakgachay makgskgot, uma tlan tlaway piwa lhi kan tuku lhakaskina tlan namaskujuy.

**Dispositivo electrónico:** Uma wa lhi kan tuku maskujukan, makgatun mapasikan, xakgtu tsukuy skuja, lha lhitamakaxtukanit.

**Cautín:** Uma lhi kan lhakaskin makskgot chu uma tlan kastlamay makapitsi lhi kan, uma kini lhislhan tuku wix lhakaskina.

**Militar:** Chixku tiku lhi kan tuku lhimapakgankgan, tiku kmakgtakgalha tachixkiwtat xlhaka chikin, wa lhitakaxtaynik.



**Fotografía:** Uma talhkaxtuy tuku lhai nak kilhtamakú, xlakaskinkga kgalhikan tuku lhimaxtukan, talhkataxtuy tuku lhai.

**Microprocesador:** Uma lhuwa makiy tachawin, tasokgne, talhakupastakne chu tlawai tuku wanikan, lha lhimaxtukanit.

**Neurona:** Uma tlan malhakgchay, kgaxtlaw na chuna tlan lhakaxtlaw tachawin xpalakata tatlaway , wa uma xlakaskinlga xpalakata tlan na skuja lhikan, na xtaxhuna lhak chixkuin, na chuna wa xakskitit chixkuin na kgalhí uma neurona.

**Inteligencia Artificial:** Wa wanputun tuku maskujinan o lha wa lhikan tuku skuja, uma makgalhtastekgoy wax talhakupastakgne karsiano lha xpalakata katuwa tlhukgoy, chuna tlaktlhan pastakgoy xi makglhuwa tlhukgoy tuku kawanikan chu tuku kamasiynikan.

**Celdas Neuronales:** Uma niku tlan makikan tuku malhakachay tachiwin nak akgskitit, xpalakata tlan naskuja, chu katuwa tlan tluway.

**Microcirugía:** uma tatlhaway xi palh wento kgaxtlhuputuna palh wantu akgtúm tuku lhiskuja, palh wa kashtlhuputuna wa mi robot.

**Ingeniero Mecatrónico:** Wa tiku lhillhay kastlhuway lhikan tuku skuja chu pokgto tulhi skuja.

**Diseñadora industrial:** Uma wantí katlhaway tuku we nak mi chik, putlhaw, lhikan tuku skuja, tuku pumin tuku tamawaya. Xi uma katlhaway katuwanata xilha skinkgoy, uma xtalhakupastakne anta tiyay nak ergonomía chu nak ingeniería xpalakata tlhan na taxtuní.

**Popote:** Uma kini tambili tlan na takgsa palh xkaspnat, palh tsakat chu makgapitsi, uma tlan na xkuytiya nak mi kilhne wa chuchut tutujuy nak mi puxalho.

**Hilaza:** Wa tsinit tuku ni taxkgata, tuku lhitsapankgan.

**Carton:** Wa uma makglhawa kgalhí kaspnat , uma tutlanka ,palhá chu ni palha taxtita lha makgapitsi kaspnat .

**Higiénico:** Matsiwise tuku lhaktlaway ki tiyatlihwakan.

**Marcador:** Wa tuku tlan lhitsokgnana nak kaspnak, uma tlak tutlanka tuku lhitatsoknan.

**Extraterrestres:** Uma wa tuku lhtamay, ni xlhak katiyatna, lha uku ni takatsiy palh xlhikana lhtamakgoy.

**Vaso:** Uma kini pokgotna, uma tlan puwaya tuka chuchutlhua, lha chuchut.

**Caimanes:** Uma tlan tuku machapinan, uma tlan mapasí akgapantu lhikan tuku skuja.

**Motor Dc:** Uma lhikan tuku skuja lhakaskin makgskgot xpalakata tlan na pasay, uma xtachuna makgskgot wantu kgalhí lhikgamanat, lhakiskin tuku mapasí. Lha uma wantu lhakiskgoy lhekgaman, nix tachuna wantu lhakiskin magskgot wantu mapasí makgskgot nak mi chik.

**Batería:** Uma wantu makí tuku lhimapasikan makgskgot , uma anta tlan na tekgsa wa tu puchawanikan, chu amakgapitsi lhikan tu skukgoy.

**Mecatronica:** Uma tlan tlhaway lhikan tuku skuja, lhakaxtlhaway, tlaway, lha xpalhakata, lha robot.

**Electrodinámico:** anda ni taxtuy tuku makamin makgskgot chu tuku kgalhi tuku lhimapasikan lhikan tuku skukgoy.

**Plástico:** Uma tsakat wantu tlan katuwa tlhukan.

**Corriente eléctrica:** uma watu tlaway pitlan na pasay mi makgskgot, chu palh lhakaskina lhikan.

**Positivo:** Uma xtan watu lhakaskina xi lhimapaiya mi makgskgot, o palh wa mi lhikgaman, anta tanuy xa tlewekge lhimapasin.

**Negativo:** Uma xtan watu lhakaskina xi lhimapaiya mi makgskgot, o palh wa mi lhikgaman, anta taxtuy watu nixa tlewekge lhimapasin.

**Videojuegos:** uma takgaman tuku tlan na akgxilha nak pugshilhna, xhi kgamanana lhakaskina na kagalhiya tuku lhimatsujikan.

**Celular:** Uma tlan kaniwa na lhipina, wa tuku puchuwina, na tlan katuwa taskujut tlaaway lha palh wento patsay.

**Dispositivo electrodinámico biocontrolador:** Uma wa tuku tlan machokgoyan tuku wix tlhaway lhakatanks na tlhaway.





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