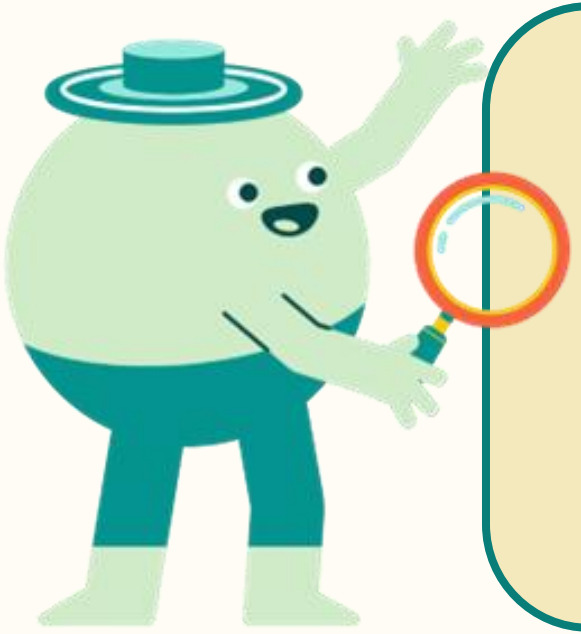
In-nos-tu tut-ki-maan il-tik-ses-sä!

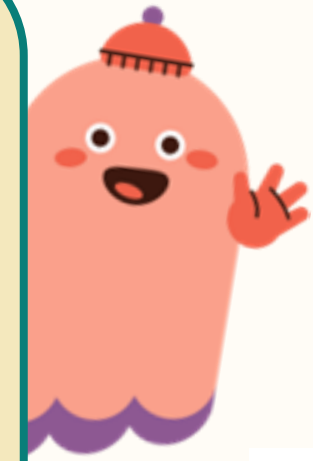
Ter-ve-tu-lo-a ker-hoon:

LUMA-KESKUS SUOMI



Koo-daa ka-ve-ril-la

Lee-na



Junior University

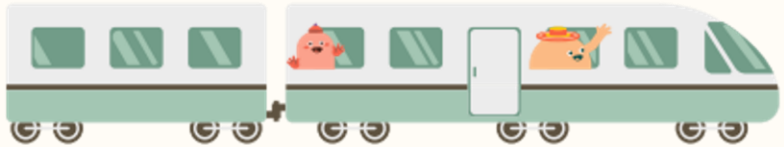
LUT University

Koo-daa ka-ve-ril-la

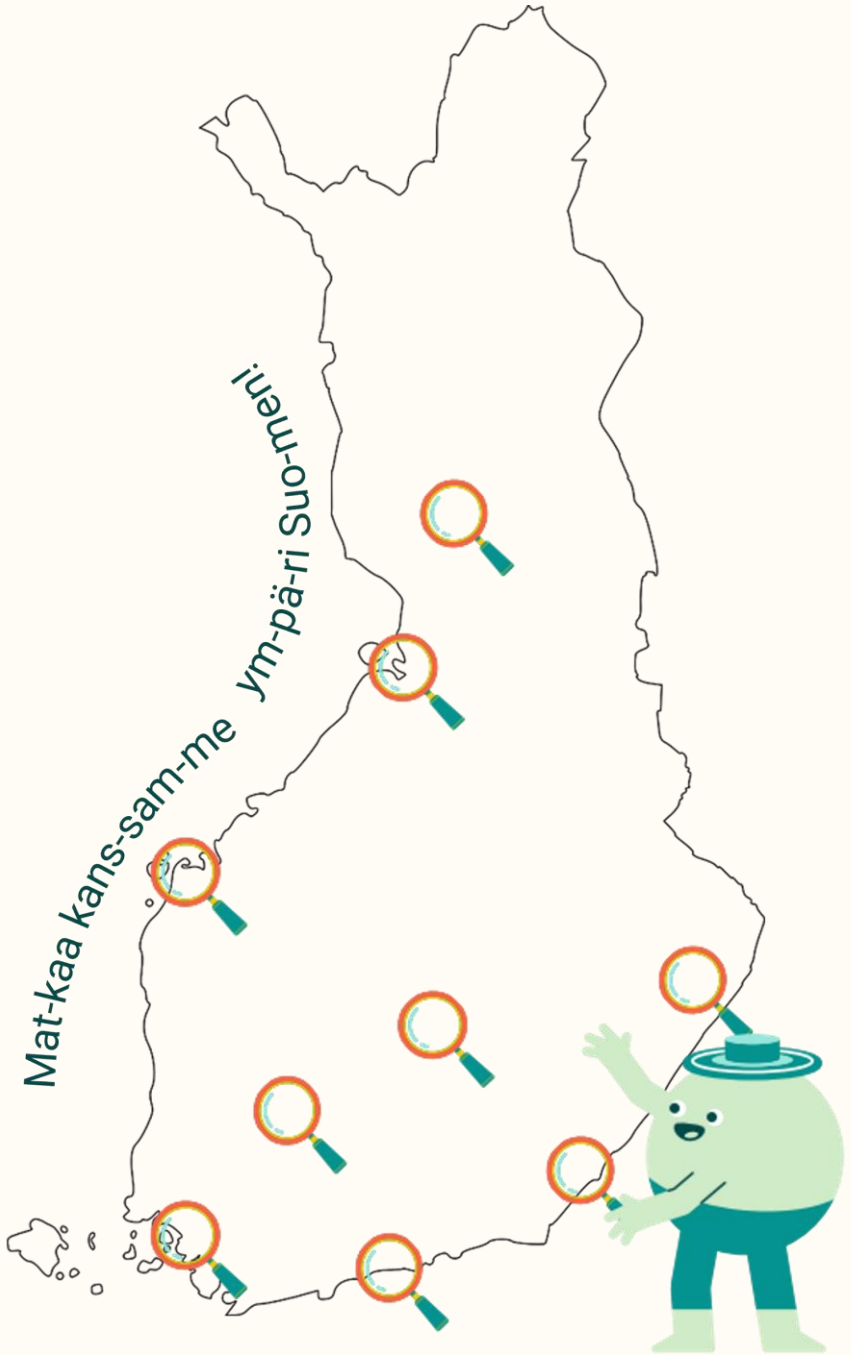
Tiis-tai 23.9.2025

Tä-mä ker-ho tu-lee Lap-peen-ran-nas-ta, ker-ho-mas-ko-tin kä-des-sä o-le-van suu-ren-nus-la-sin koh-das-ta.

Tu-tus-tu-taan koo-daa-mi-seen eli oh-jel-moin-tiin.



“Tä-mä on tie-de-ju-na kai-kil-le tut-ki-mi-ses-ta kiin-nos-tu-neil-le. Py-säh-dym-me kai-kil-la vä-li-a-se-mil-la!”



Koo-daa-mi-nen e-li oh-jel-moin-ti

Tie-to-ko-neel-le tai ro-bo-til-le oh-jei-ta:
mi-tä sen pi-tää teh-dä.

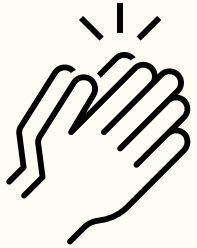
Nyt te o-let-te ro-bot-te-ja!

A-luk-si mi-nä oh-jel-moin tei-tä!

Nous-kaa y-lös! Val-mis-tau-tu-kaa ro-bot-ti-tans-siin!

Ro-bot-ti-tans-si

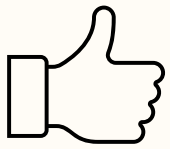
Käs-kyt e-li koo-dit



Hyp-pää!

Pyö-räh-dä!

Po-see-raa!

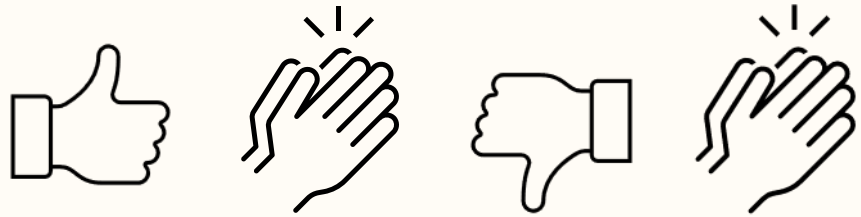


As-kel
e-teen

As-kel
taak-se

Ro-bot-ti-tans-si

Tans-si-taan!

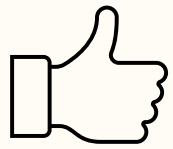


Käs-kyt e-li koo-dit

Hyp-pää!

Pyö-räh-dä!

Po-see-raa!



As-kel
e-teen

As-kel
taak-se

Ro-bot-ti-tans-si

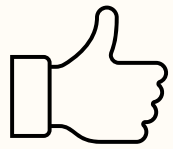
Tans-si-taan!

Käs-kyt e-li koo-dit

Hyp-pää!

Pyö-räh-dä!

Po-see-raa!



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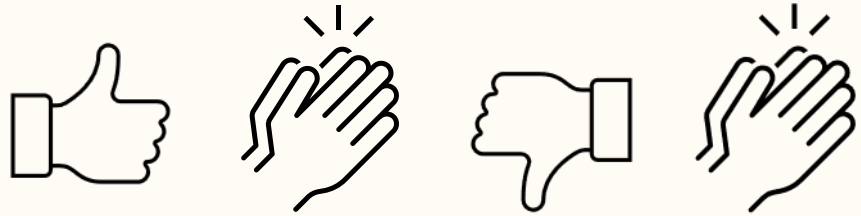
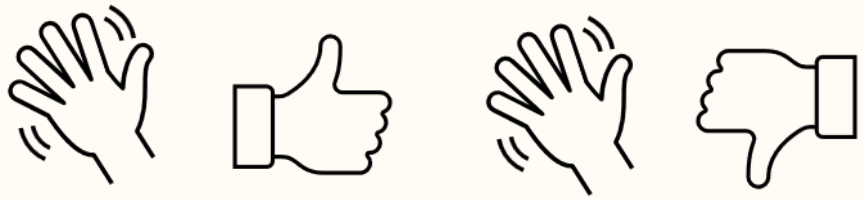
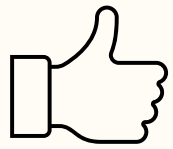




Ro-bot-ti-tans-si

Tans-si-taan!

Käs-kyt e-li koo-dit



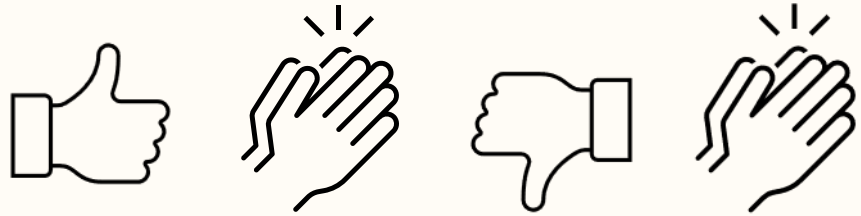
As-kel
e-teen

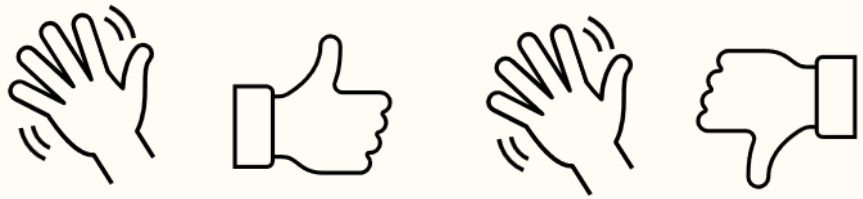
As-kel
taak-se

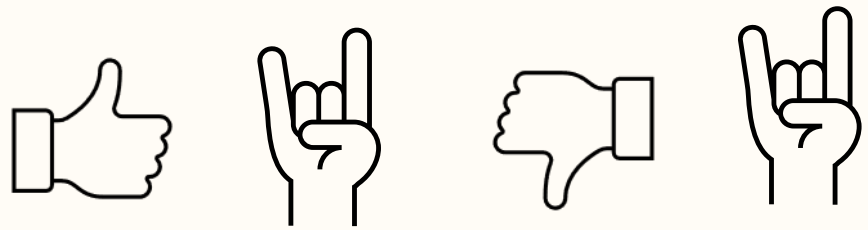
Hyp-pää!

Pyö-räh-dä!

Po-see-raa!







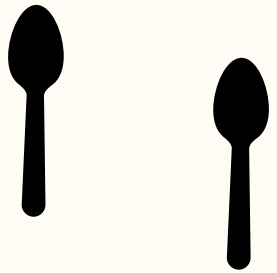
Koo-da-taan ka-ve-ri-a

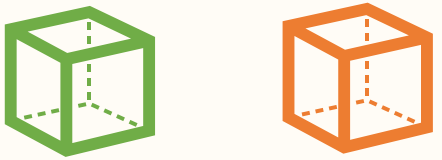
Ke-rät-kää käs-kyik-si so-pi-
vat e-si-neet, e-si-mer-kik-si:

Oi-ke-a ken-kä = kään-ny oi-
ke-al-le

Va-sen ken-kä = kään-ny va-
sem-mal-le

Kep-pi tai lu-sik-ka = as-kel
e-teen-päin





Koo-da-taan ka-ve-ri-a

Ke-rät-kää käs-kyik-si so-pi-
vat e-si-neet, e-si-mer-kik-si:

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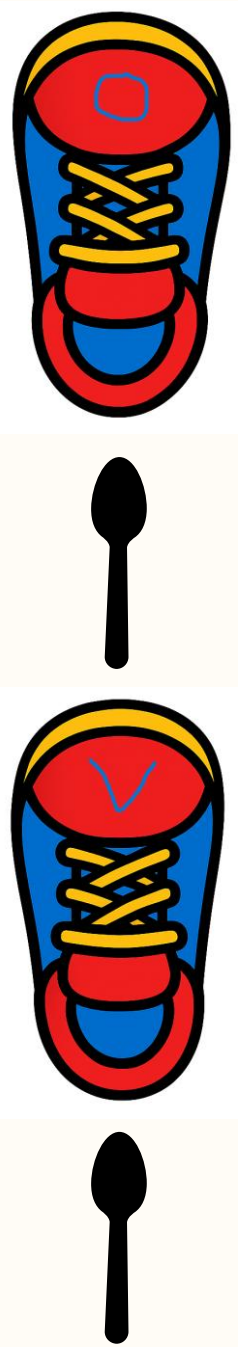
Kep-pi tai lu-sik-ka = as-kel
e-teen-päin

Oh-
jel -
ma



Koo-daa
pa-rin
kans-sa
vuo-ro-tel-
len:

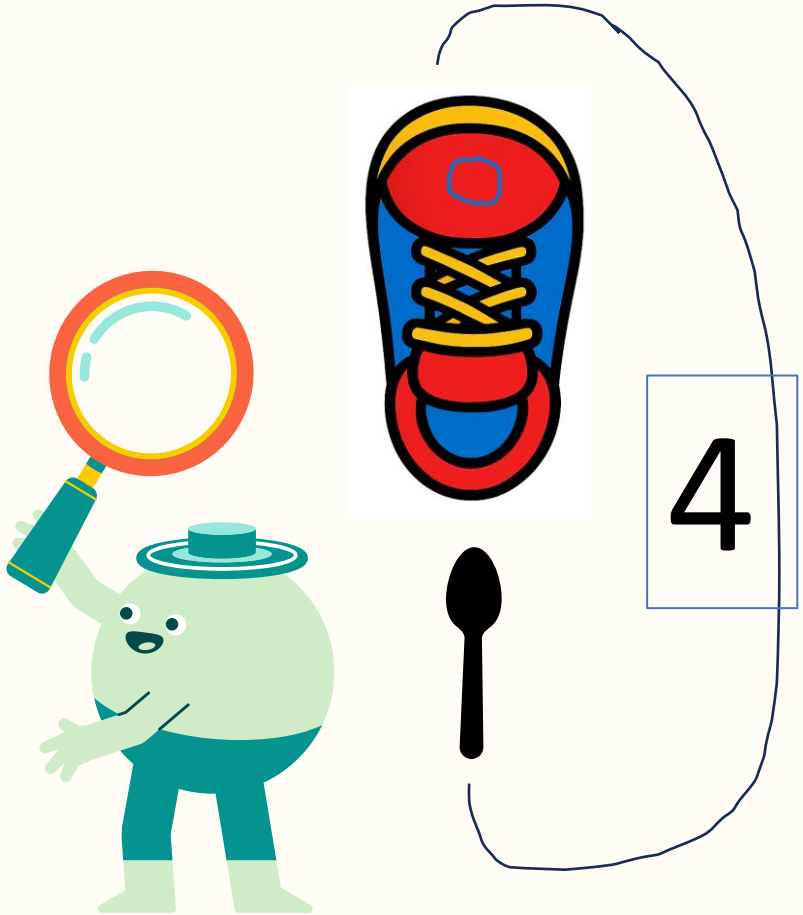
toi-nen a-
set-taa
käs-kyt lat-
ti-al-le,
toi-nen
suo-rit-taa
oh-jel-man

Koo-da-taan ka-ve-ri-a e-si-neil-lä

Pa-ril-la ken-gäl-lä ja pa-ril-la lu-si-kal-la saa ai-ka ly-hyi-tä oh-jel-mi-a.

O-te-taan tois-to mu-kaan!

Et-si pit-kä na-ru ja kir-joi-ta nu-me-rot 1, 2 ja 4 ku-kin e-ri pa-pe-ril-le.



Na-ru tar-koit-taa tois-to-a ja nu-me-ro tois-to-jen mää-rää.

Mil-lai-sen ku-vi-on “ro-bot-ti” kä-ve-lee täl-lä koo-dil-la?

Teh-kää po-ru-kal-la pi-dem-piä koo-de-ja!

Mi-ten tie-to-ko-ne las-kee?

Tie-to-ko-ne käyt-tää vain nol-li-a ja yk-kö-si-ä e-li bit-te-jä.

1 = “mu-ka-na!”

0 = “ei mu-ka-na”

- 0 0 0 → lu-ku on 0
- 0 0 1 → 1 mu-kana. Lu-ku on 1
- 0 1 0 → 2 mu-ka-na. Lu-ku on 2

Nu-me-ron paik-ka ker-too sen ar-von. Kol-men nu-me-ron lu-vus-sa ar-vot o-vat 4, 2 ja 1.

Mi-ten tie-to-ko-ne las-kee?

Tie-to-ko-ne käyt-tää vain nol-li-a ja yk-kö-si-ä e-li bit-te-jä.

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Nu-me-ron paik-ka ker-too sen ar-von. Kol-men nu-me-ron lu-vus-sa ar-vot o-vat 4, 2 ja 1.

- 0 0 0 → lu-ku on 0
- 0 0 1 → 1 mu-kana. Lu-ku on 1
- 0 1 0 → 2 mu-ka-na. Lu-ku on 2
- 0 1 1 → 2 ja 1 mu-ka-na. Lu-ku on 2+1 = 3
- 1 0 0 → 4 mu-ka-na. Lu-ku on 4
- 1 0 1 → 4 ja 1 mu-ka-na. Lu-ku on 4 + 1 = 5
- Jo-ko ar-vaat lu-vut 6 ja 7?

Ih-mis-las-ku-ri eli 3-bit-ti-nen tie-to-ko-ne

Ih-mis-las-ku-riin tar-vi-taan
kol-me las-ta ri-viin.

- E-kal-le lap-pu nu-me-ro 4
- To-kal-le lap-pu nu-me-ro 2
- Kol-man-nel-le lap-pu nu-me-ro 1

Is-tu-va ka-ve-ri kuu-luu tois-een las-ku-riin ☺

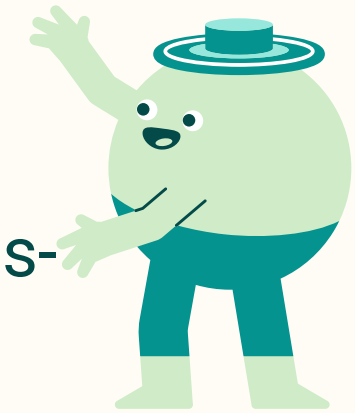
Ih-mis-las-ku-ri eli 3-bit-ti-nen tie-to-ko-ne

Jos o-let yk-kö-nen e-li mu-ka-na lu-vu-ssa, sei-so!

Jos olet nol-la eli et mu-ka-na lu-vu-ssa, me-ne kyyk-kyyn.

Muut an-taa lu-vun. Las-ku-ri näyt-tää sen.

Mi-ten las-ku-ri las-kee nol-las-ta seis-kaan?



Kaik-ki kyy-kys-sä.

Lu-ku on 0+0+0 = 0

Ih-mis-las-ku-ri

4 + 0 + 1 = 5

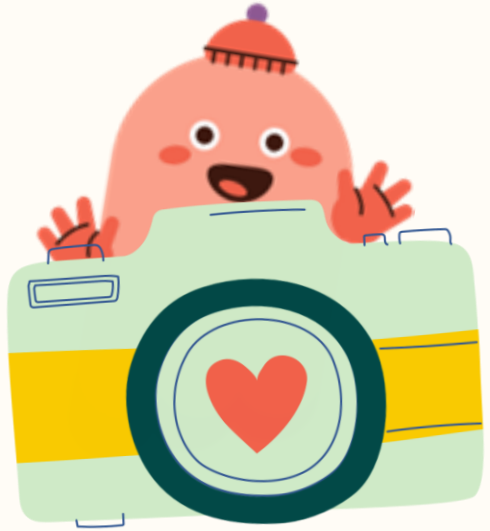
5

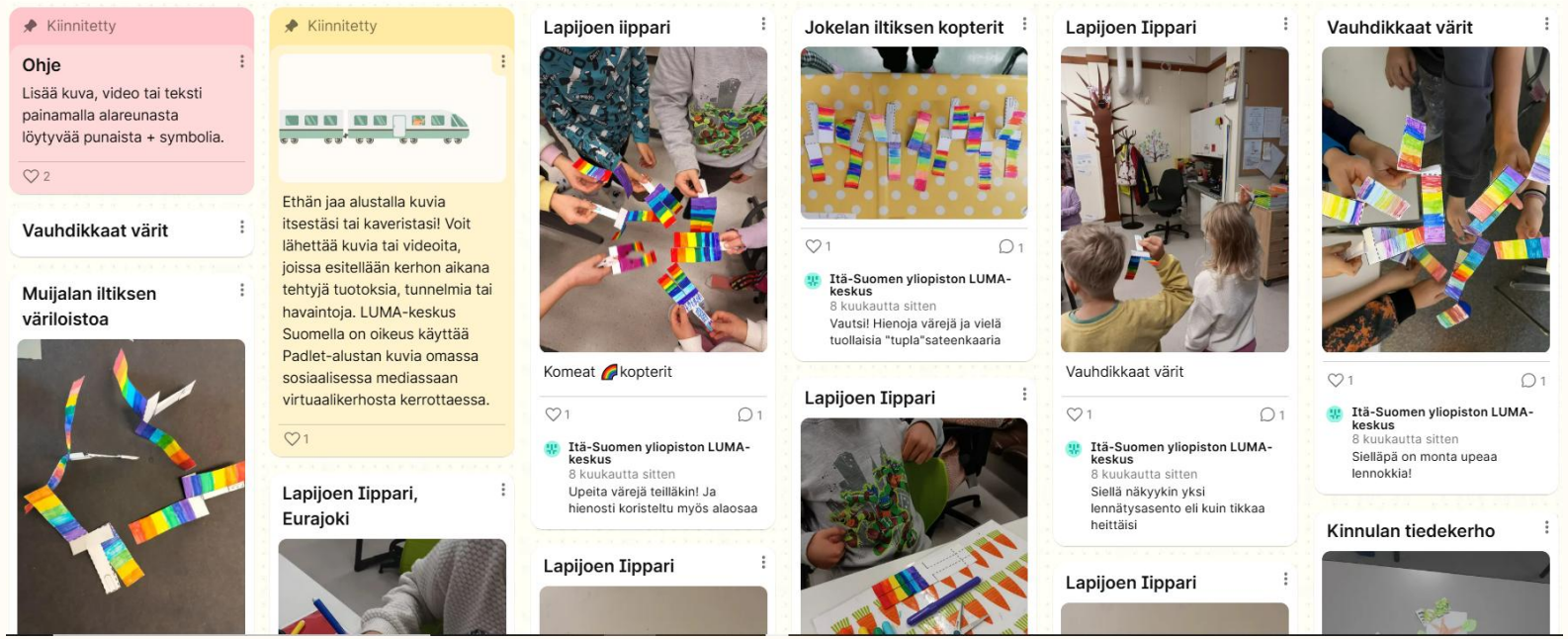
6

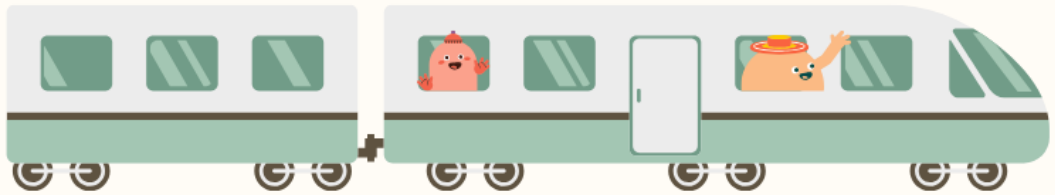
4 + 2 + 0 = 6

Il-tik-sen Pad-let

Ja-ka-kaa tun-nel-mi-a ker-hos-tan-ne ku-va-sei-näl-lem-me!



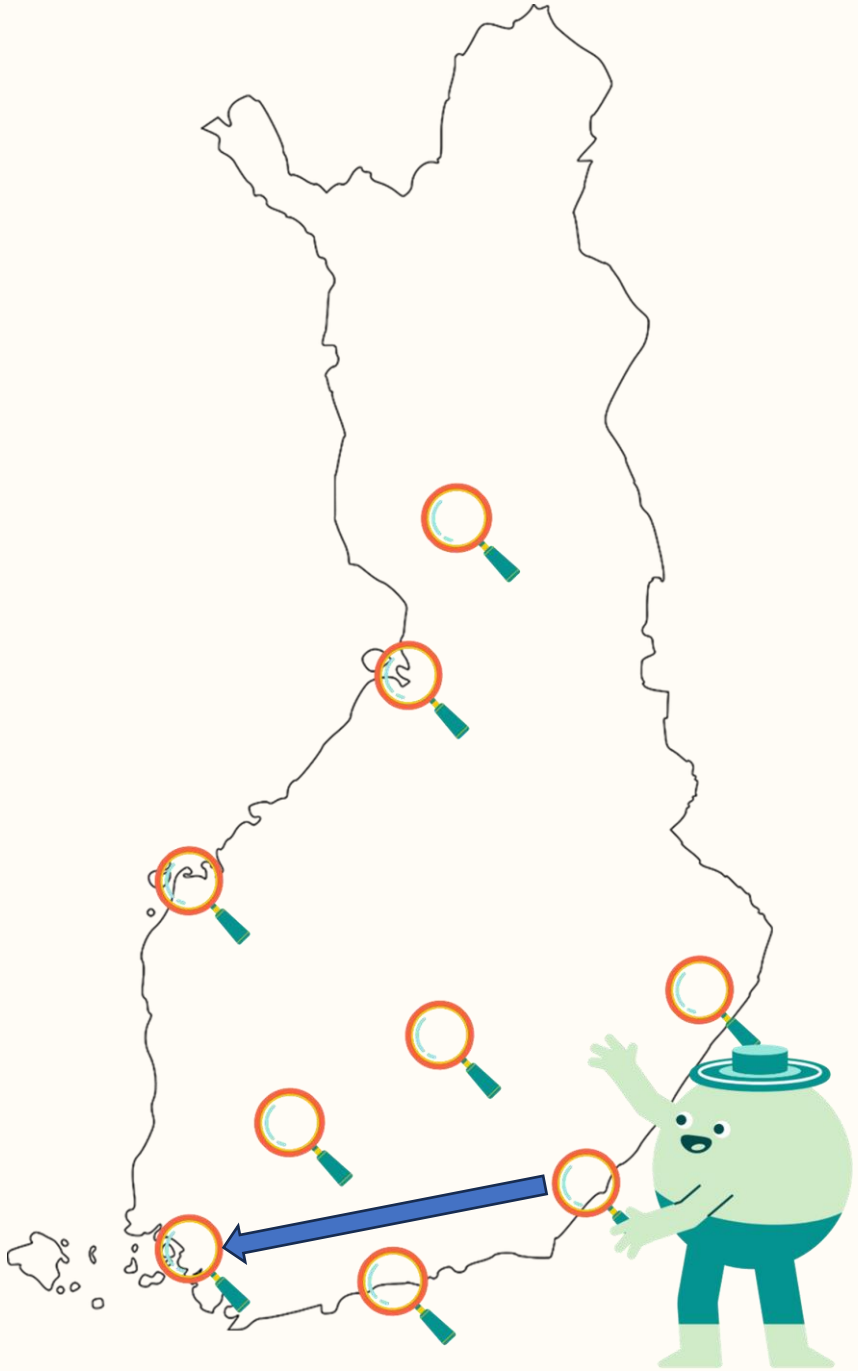




Kii-tos täs-tä ker-ras-ta!

Seu-raa-vak-si mat-kaam-me… Tur-kuun,

herk-ku-seik-kai-le-maan kas-vi-tie-teel-li-sel-lä puu-tar-
ha-lla: sel-vi-te-tään mis-tä he-del-mät ja her-kut tu-le-vat!



LUMA-KESKUS SUOMI