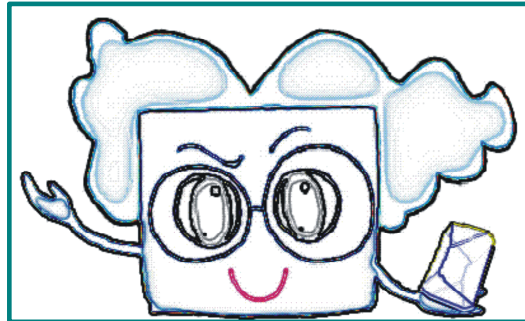


MATEMČEK

tekmovanje iz prostorske predstavlivosti



REŠITVE VAJ ZA TEKMOVANJE (1)

za učence od 1. do 4. razreda

MATHEMA

NALOGE ZA PRVOŠOLCE

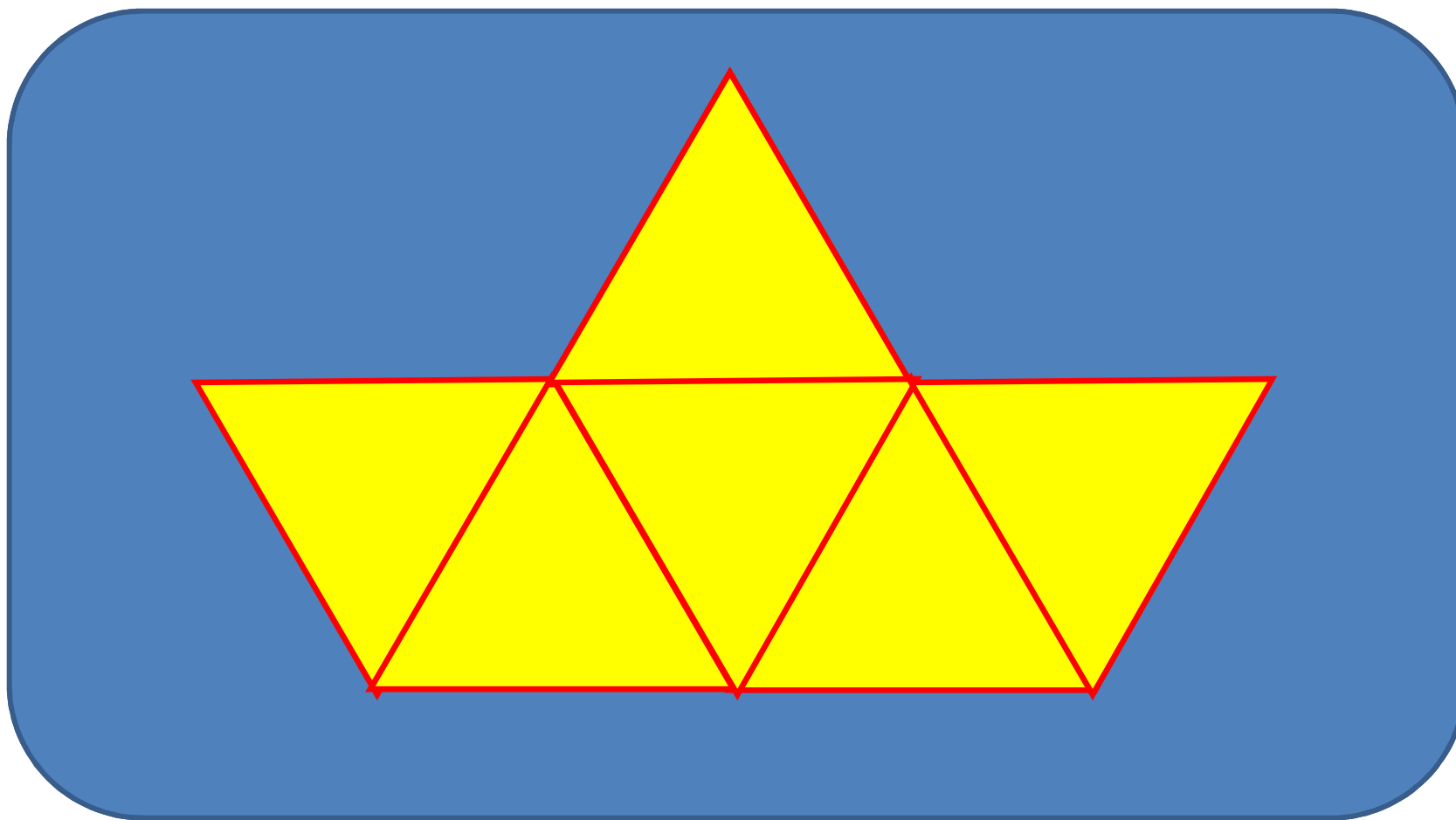
REŠITEV



LIK
TELO
KOCKA
TRIKOTNIK
STRANICA
LEVO
DESNO

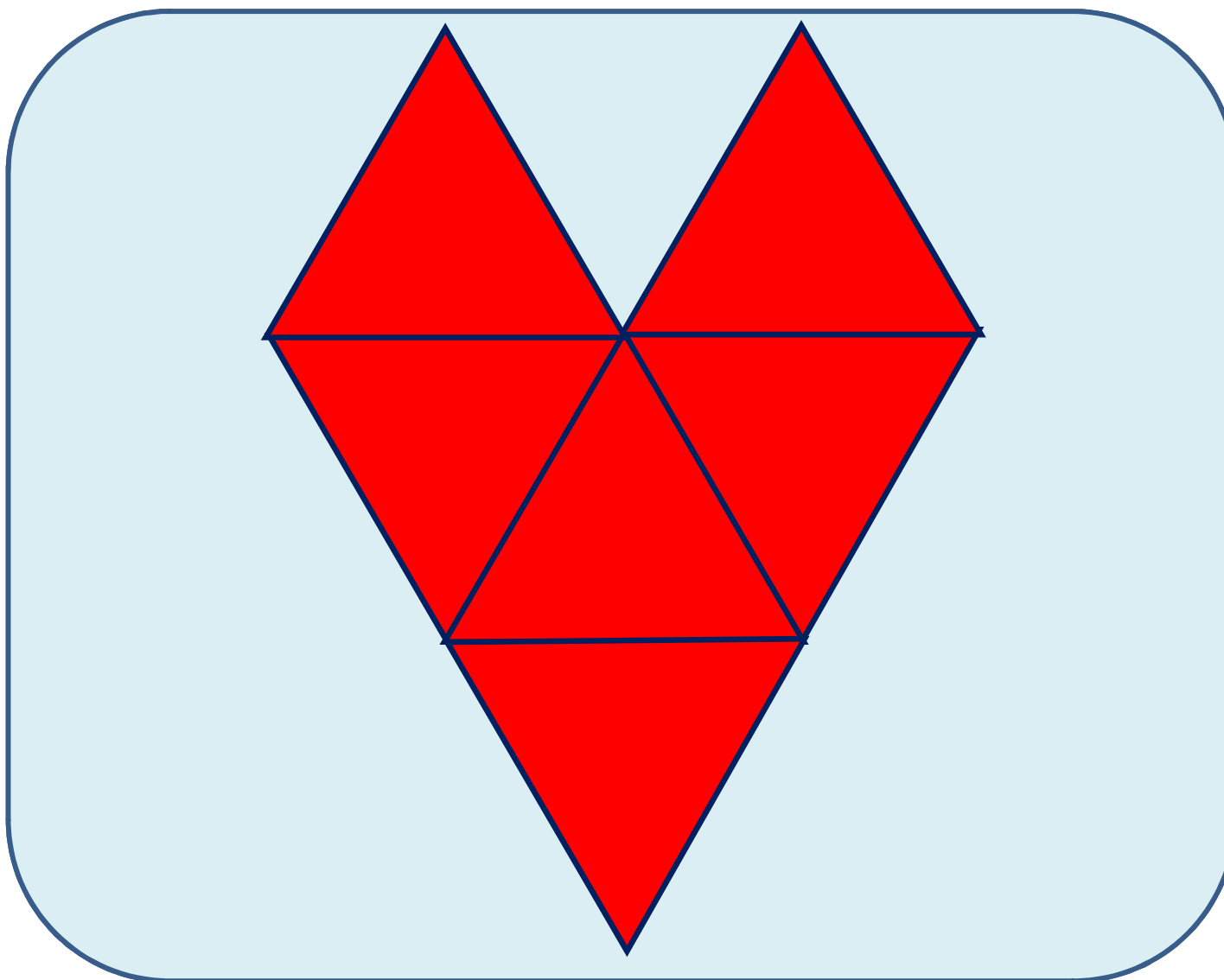


- ★ LADJO SESTAVI IZ (6) TRIKOTNIKOV, KI IMAJO VSE STRANICE ENAKO DOLGE.

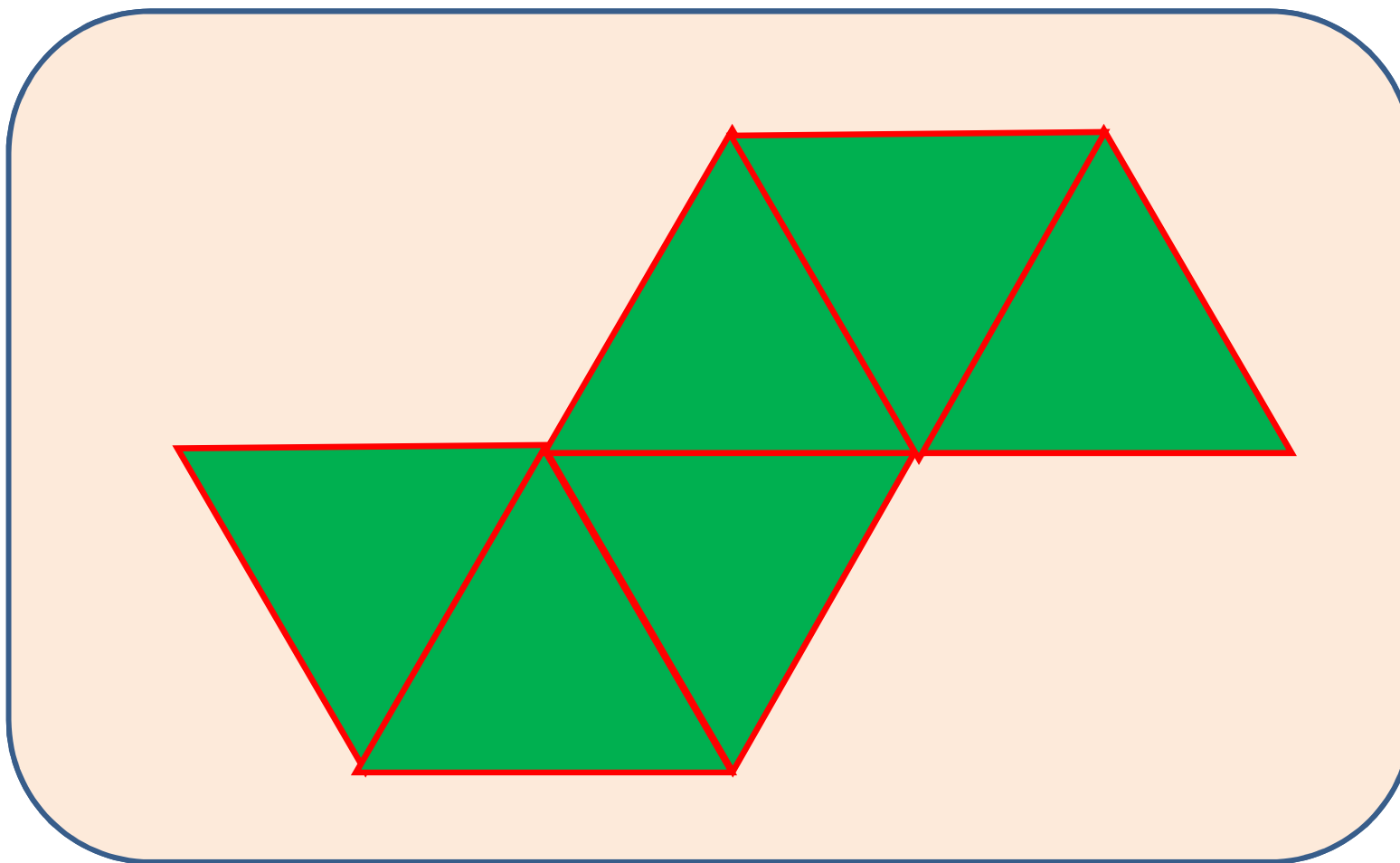




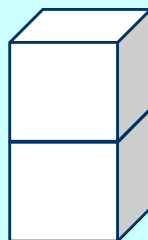
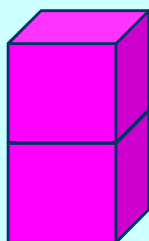
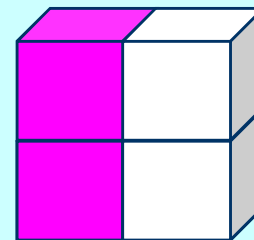
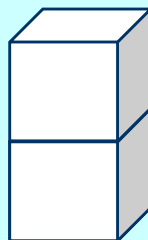
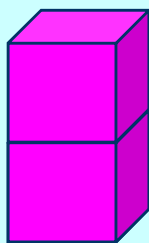
SRČEK SESTAVI IZ (6) TRIKOTNIKOV, KI IMAJO VSE STRANICE ENAKO DOLGE.



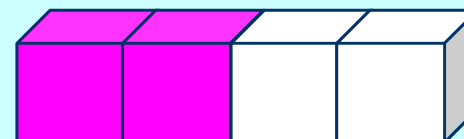
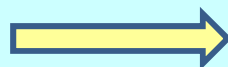
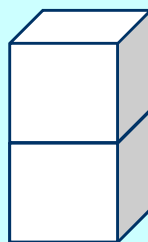
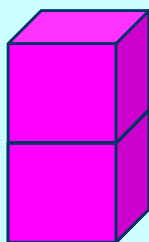
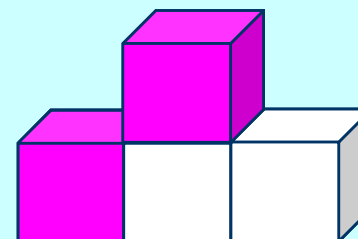
- ★ SLIKO SESTAVI IZ (6) TRIKOTNIKOV, KI IMAJO VSE STRANICE ENAKO DOLGE.



★ SAMO ENEGA OD DESNIH TELES NE MOREŠ SESTAVITI IZ LEVIH DVEH? KATEREGA?

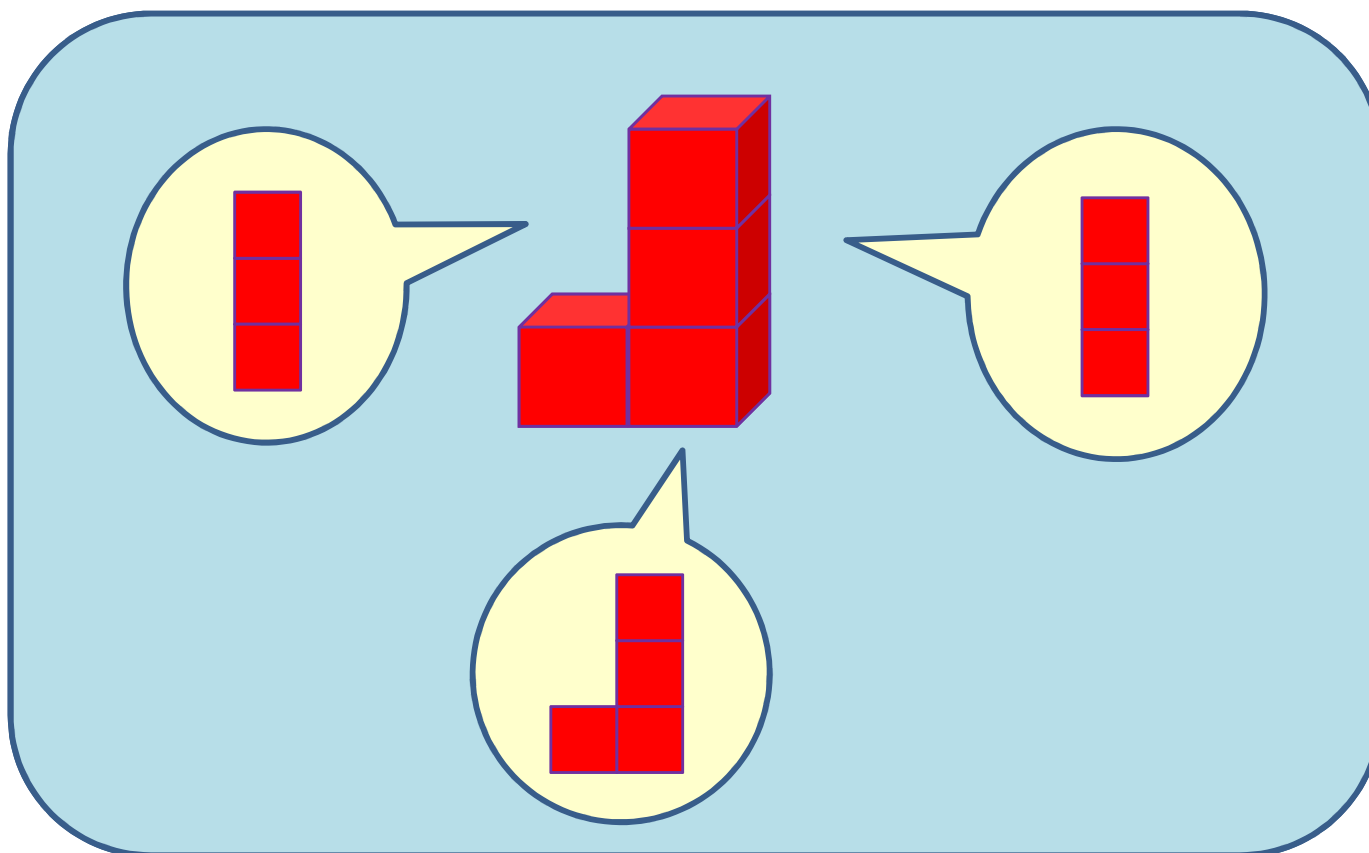


NI MOGOČE



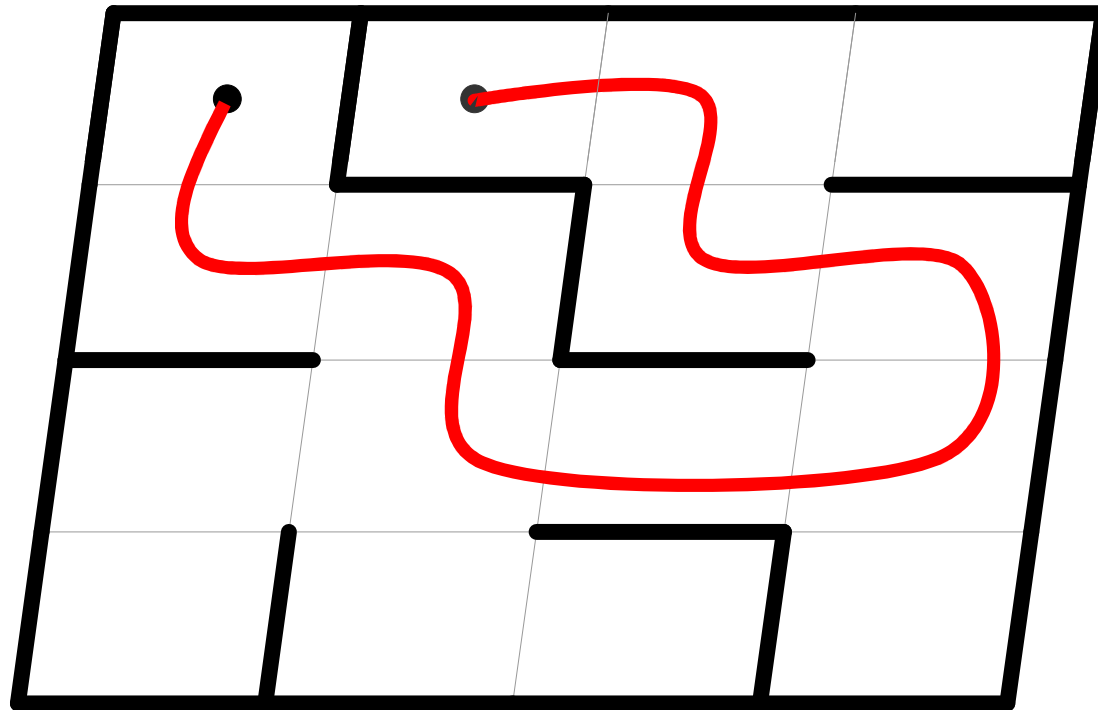


NARIŠI, KAKO VIDIŠ TELO, ČE STOPIŠ NA NJEGOVO LEVO ALI DESNO STRAN, ALI SPREDAJ.

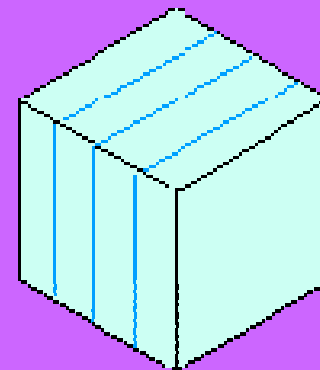
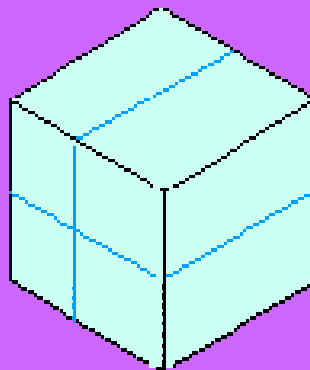
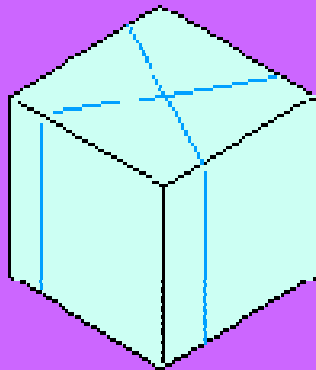
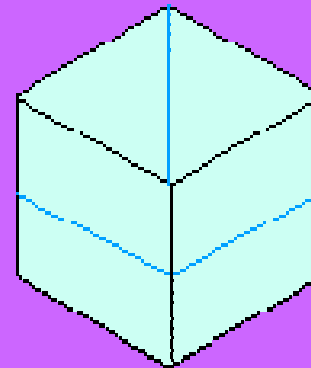
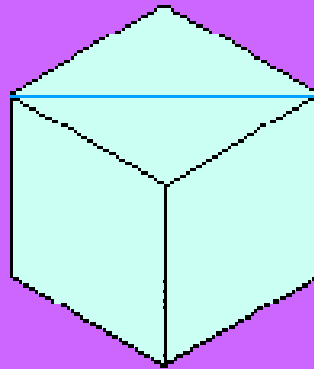
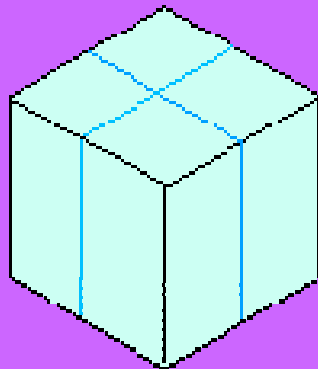




POIŠČI POT SKOZI LABIRINT OD ENE DO DRUGE PIKE.
(NAJKRAJŠA POT POMENI, DA NA POTI OBIŠČEŠ ČIM MANJ POLJ.)



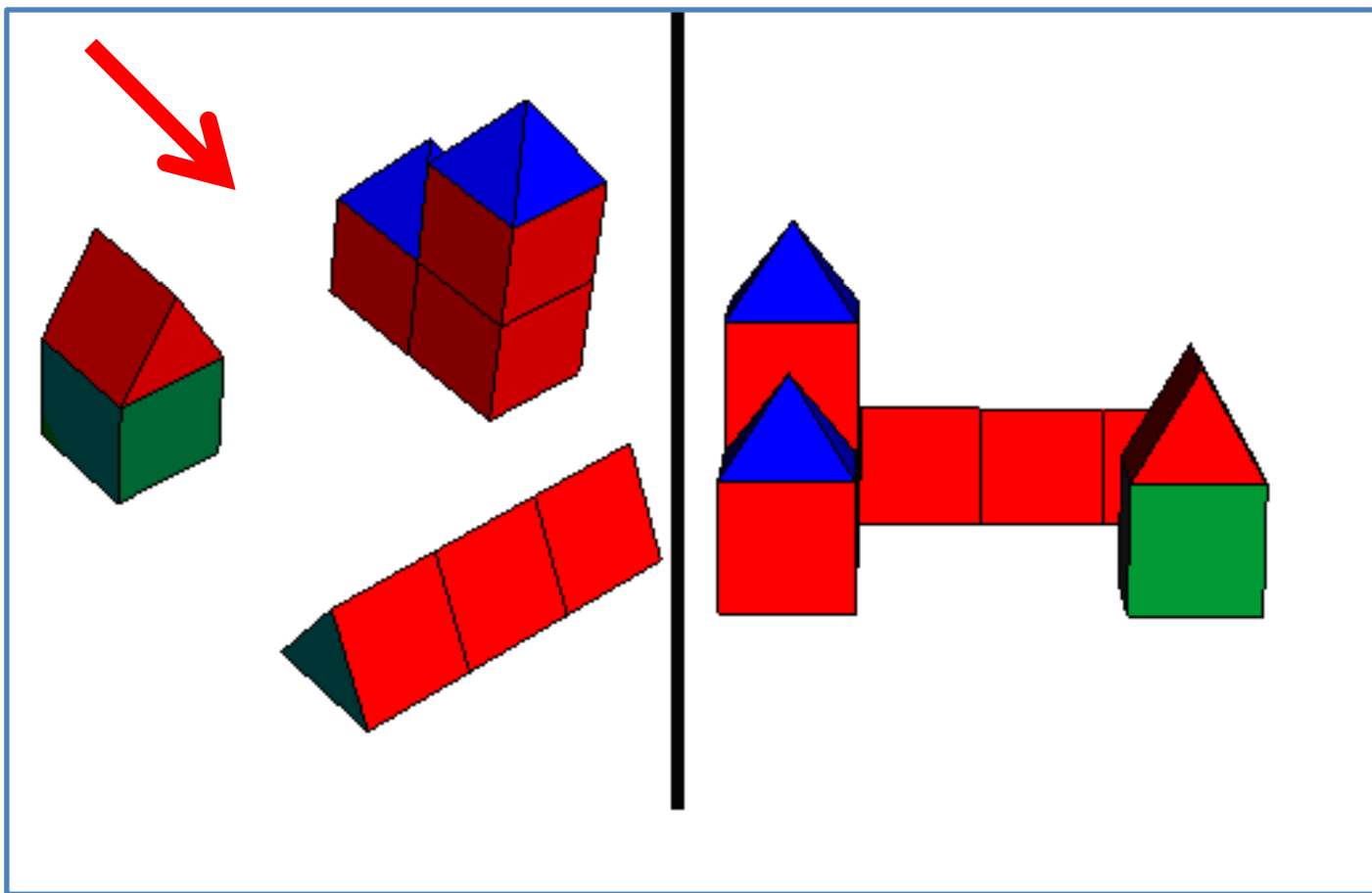
- ★ ČRTE PONAARJAJO REZE, S KATERIMI PREREŽEMO KOCKO. ALI SO Z REZI VSE KOCKE RAZDELJENE NA ENAKO ŠTEVILO DELOV?



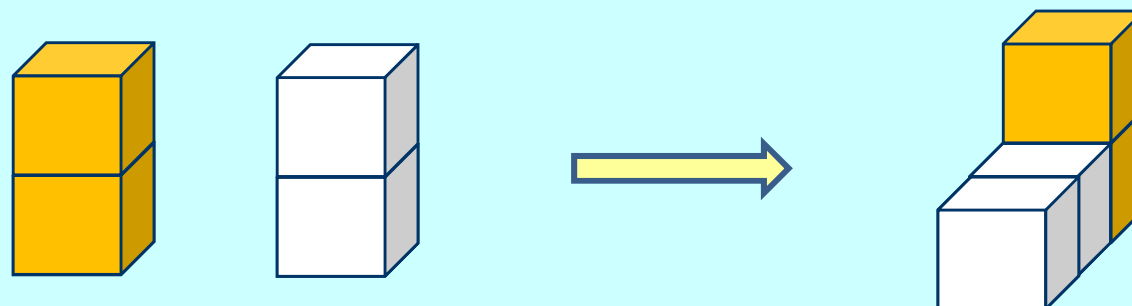
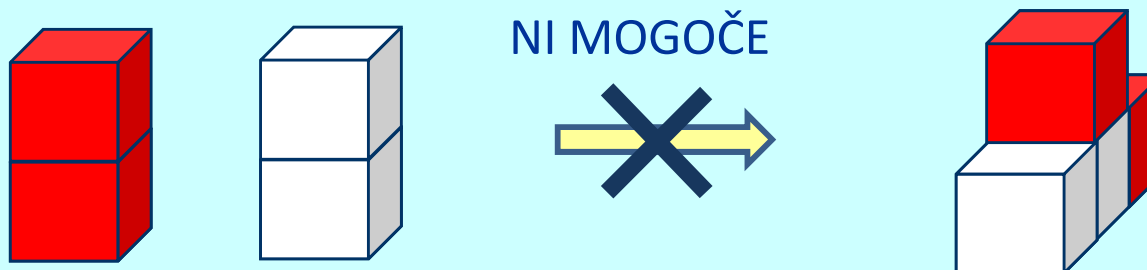
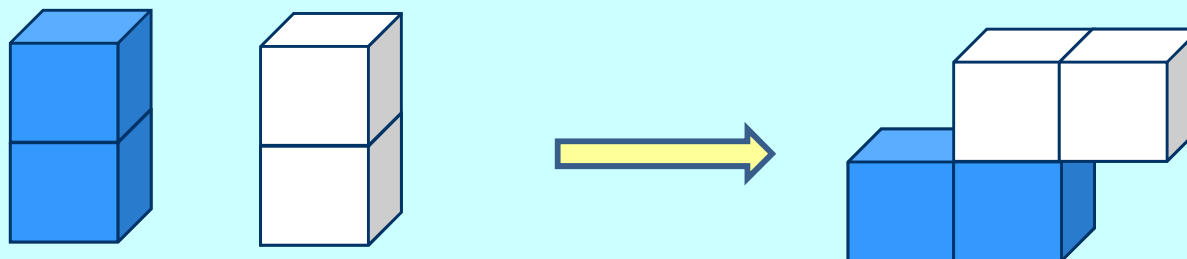
DA, VSE KOCKE SO Z REZI RAZDELJENE NA ENAKO ŠTEVILO DELOV (4).



OZNAČI, IZ KATERE SMERI GLEDAŠ SLIKO NA LEVI, DA JO VIDIŠ, KOT JE NARISANA NA DESNI.

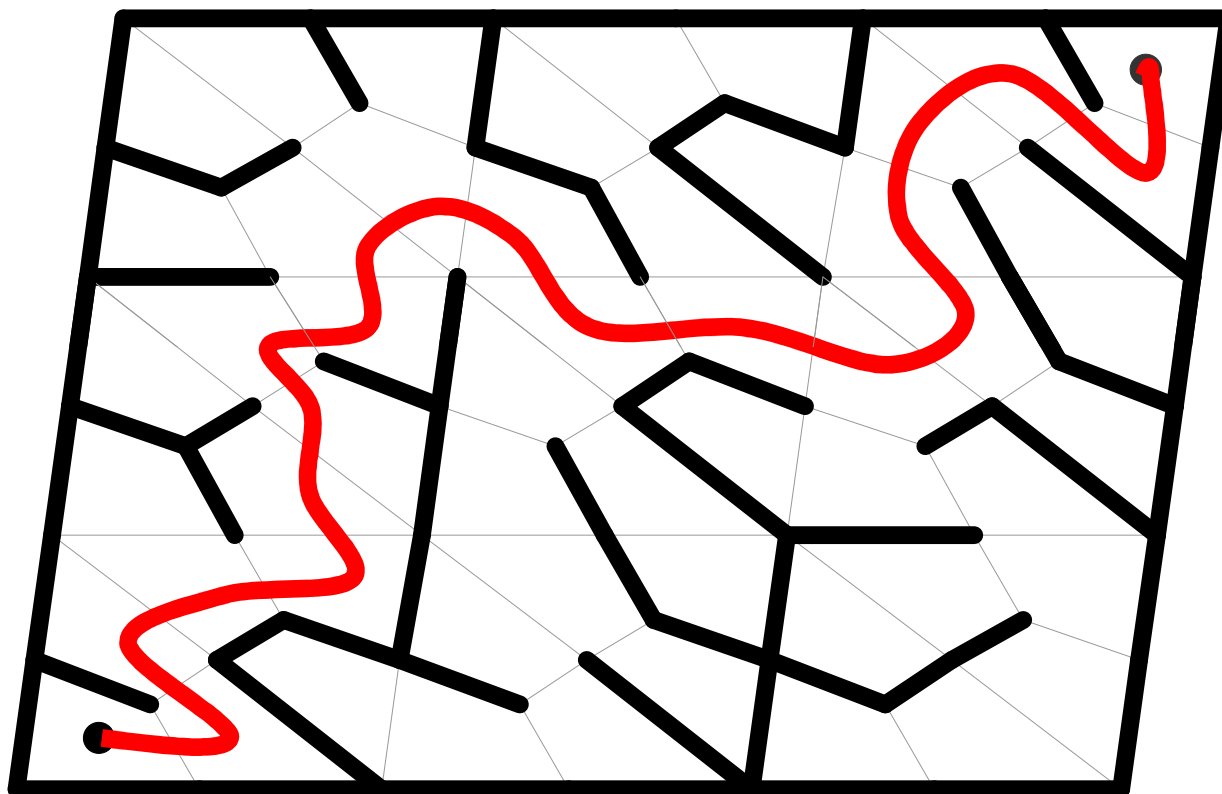


★ SAMO ENEGA OD DESNIH TELES NE MOREŠ SESTAVITI IZ LEVIH DVEH? KATEREGA?



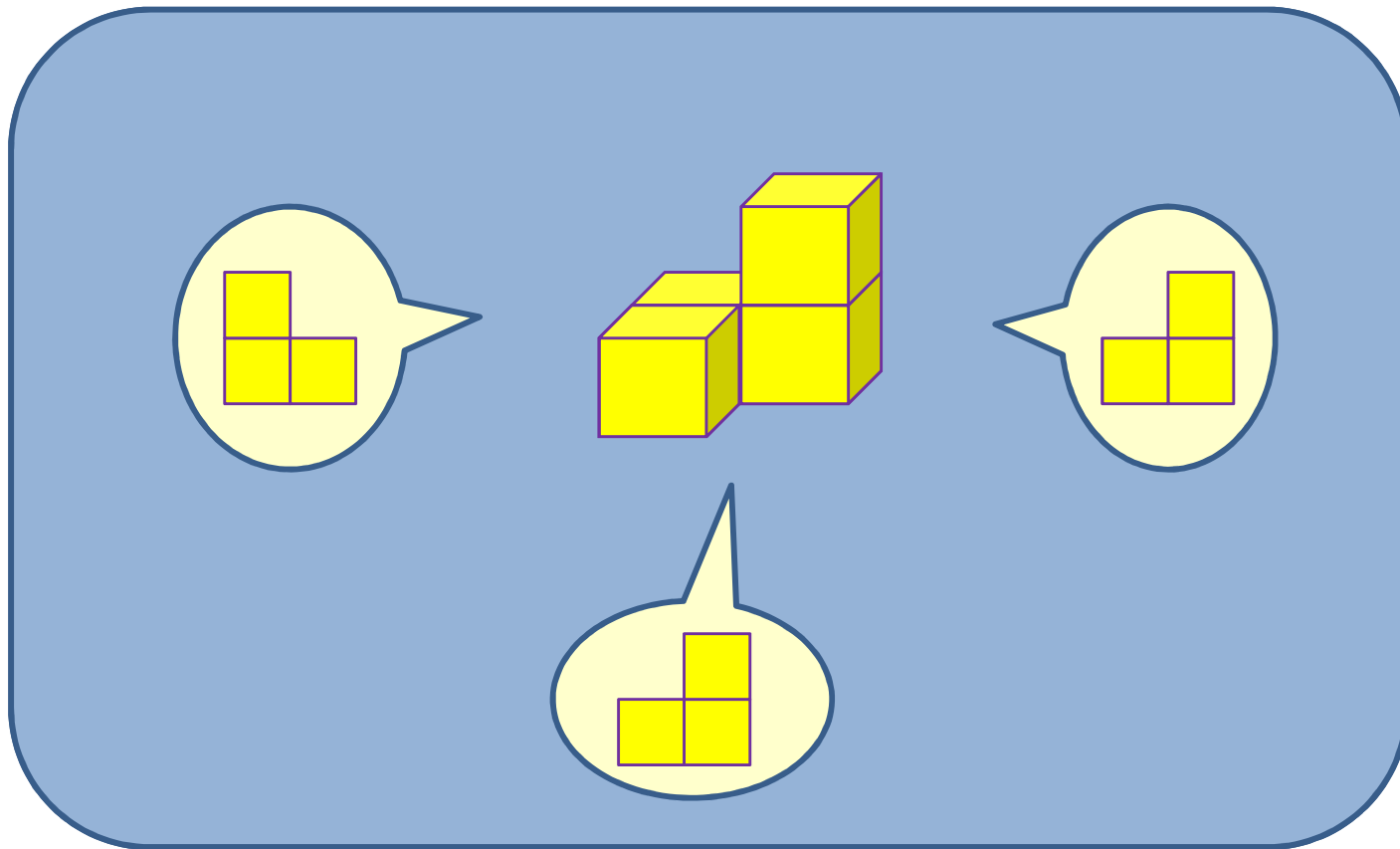


POIŠČI POT SKOZI LABIRINT OD ENE DO DRUGE PIKE.



(NAJKRAJŠA POT POMENI, DA NA POTI OBIŠČEŠ ČIM MANJ POLJ.)

- ★ NARIŠI, KAKO VIDIŠ TELO, ČE STOPIŠ NA NJEGOVO LEVO, DESNO ALI SPREDAJ.



NALOGE ZA DRUGOŠOLCE

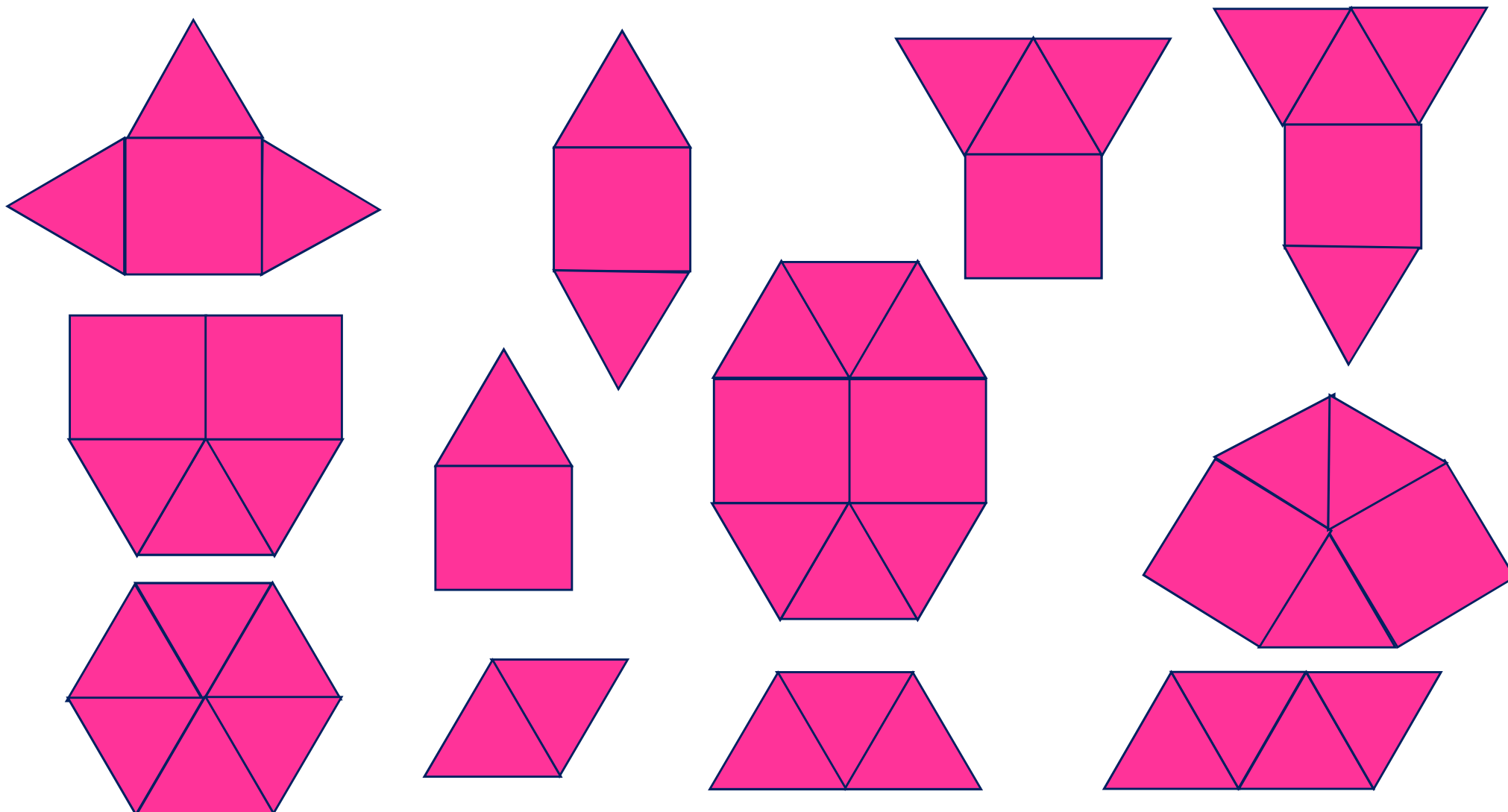
REŠITEV



KVADRAT
TRIKOTNIK
ENAKOSTRANIČNI TRIKOTNIK
KOCKA
MEJNA PLOSKEV



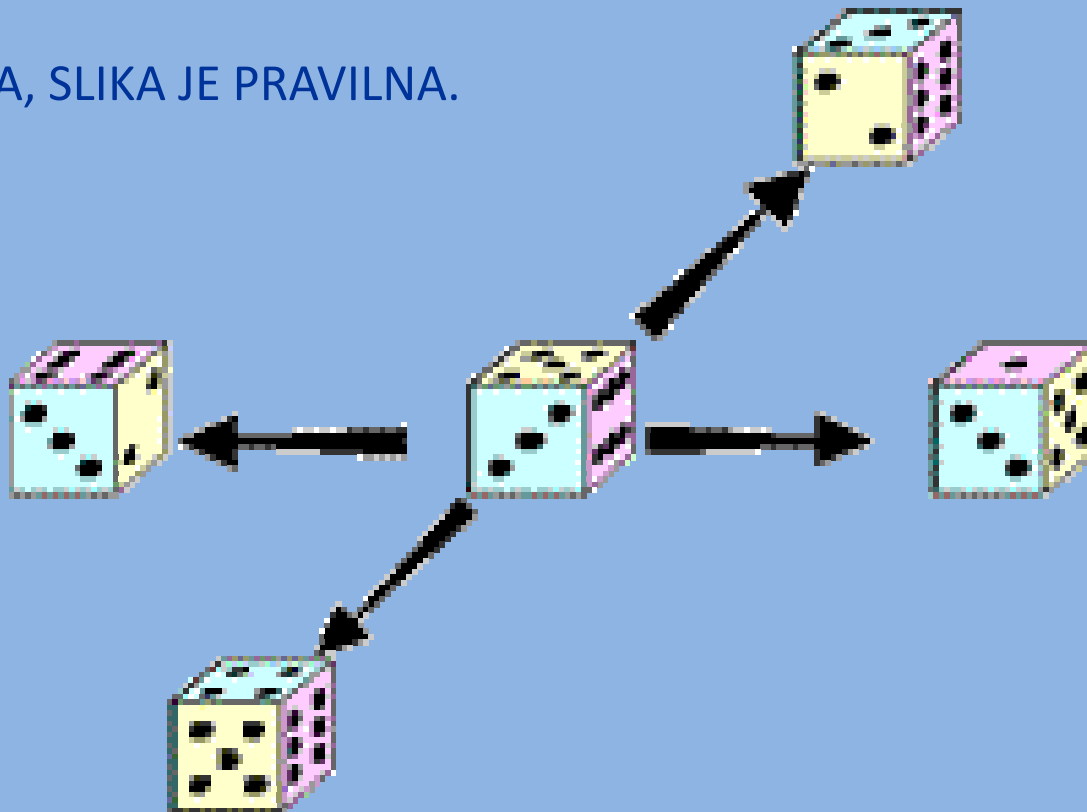
★ LIKI SPODAJ SO SESTAVLJENI IZ TRIKOTNIKOV IN KVADRATOV, KI IMAJO VSE STRANICE ENAKO DOLGE. VRIŠI ČRTE, DA BO LIK SESTAVLJEN IZ ČIM MANJ TRIKOTNIKOV ALI KVADRATOV.





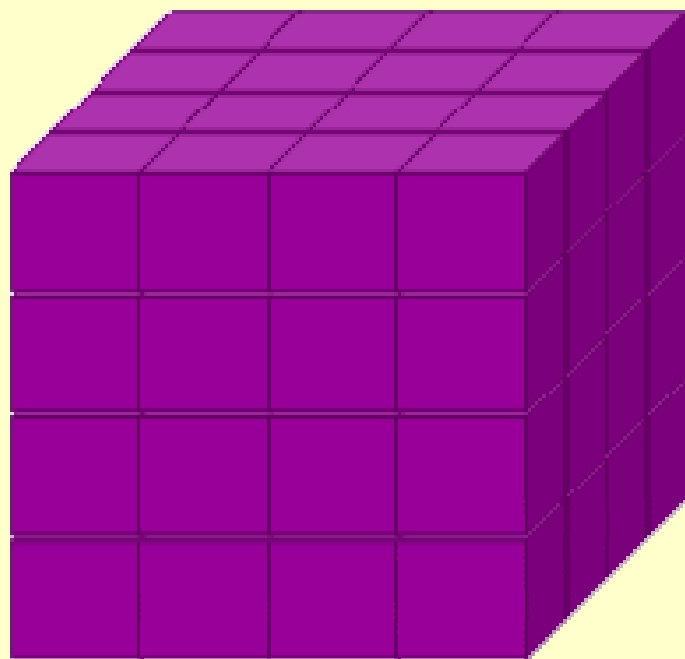
SEŠTEVEK PIK NA NASPROTNIH MEJNIH PLOSKVAH KOCKE JE 7.
PUŠČICA PREDSTAVLJA KOTALJENJE KOCKE PREKO ROBA V DOLOČENI SMERI.
JE SLIKA PRAVILNA?

DA, SLIKA JE PRAVILNA.

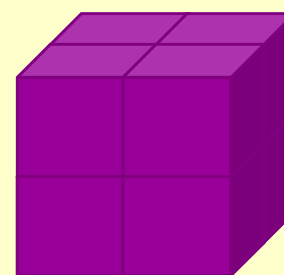




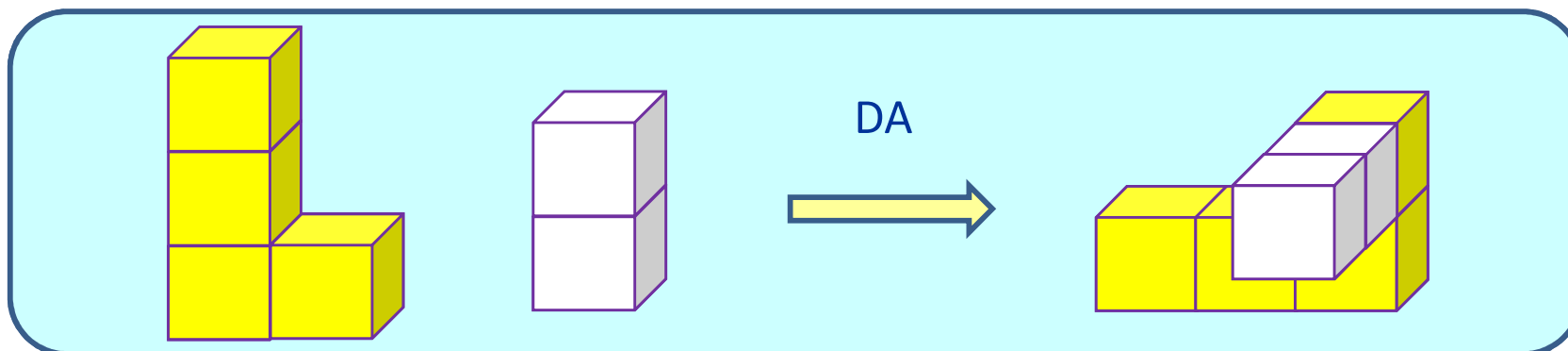
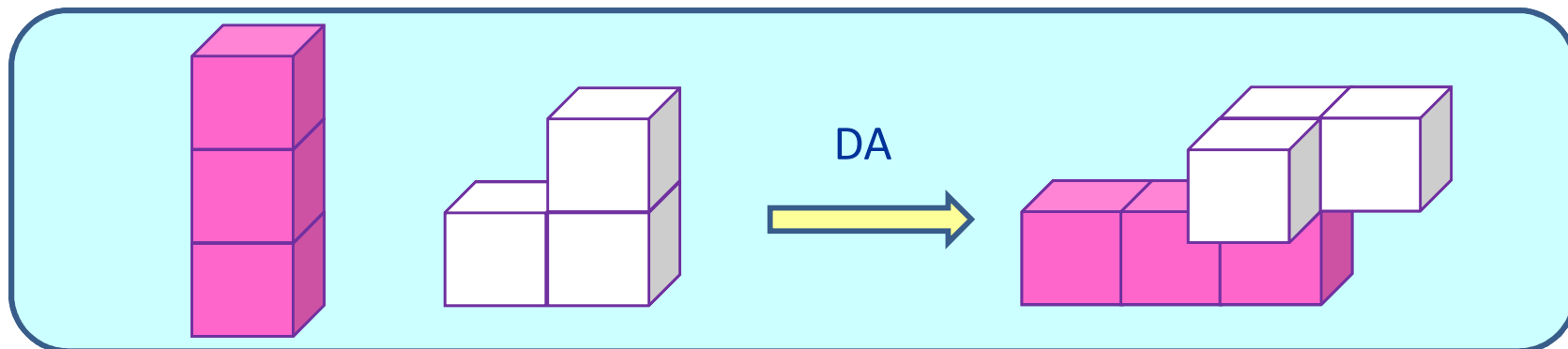
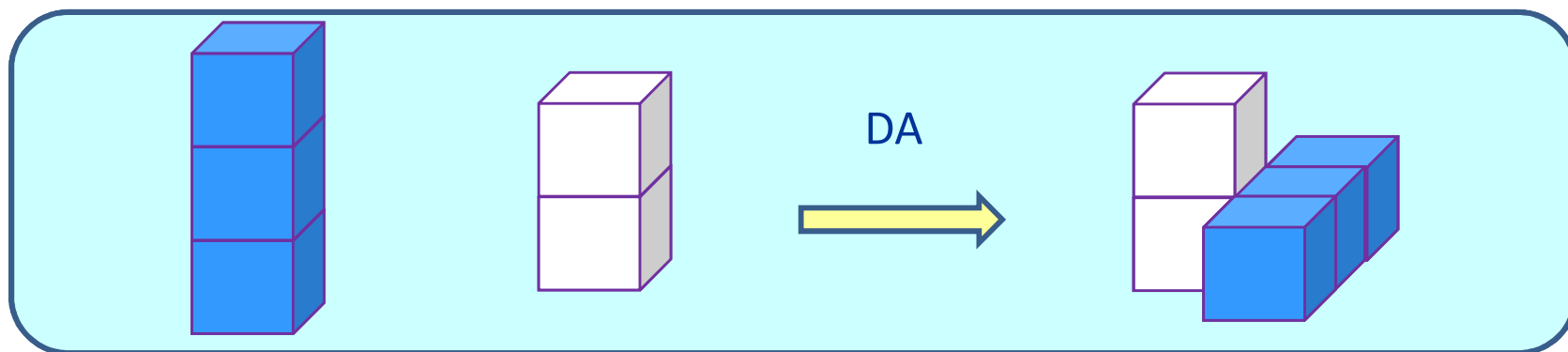
KOLIKO KOCK, KOT JE KOCKA NA DESNI, POTREBUJEŠ, DA IZ NJIH SESTAVIŠ VELIKO KOCKO NA LEVI?



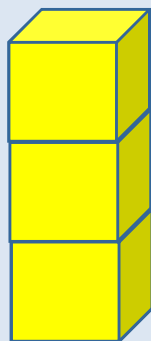
POTREBUJEŠ 8 KOCK.



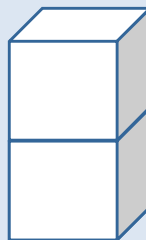
★ ALI LAHKO TELES NA DESNI SESTAVIŠ IZ TELES NA LEVI?



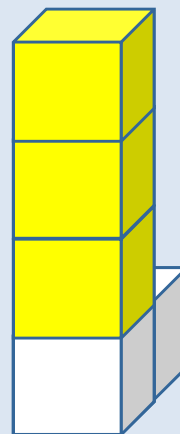
★ KATERI RAČUN JE PRAVILEN?



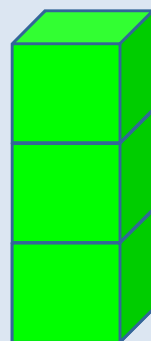
+



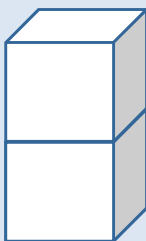
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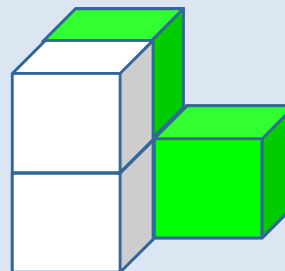
PRAVILEN



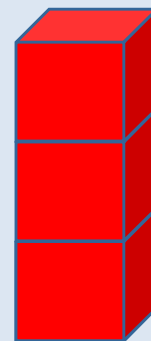
+



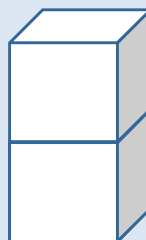
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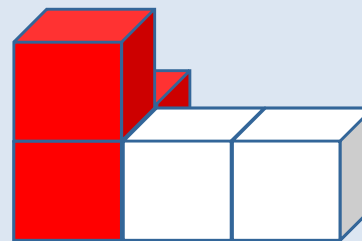
NEPRAVILEN



+



=

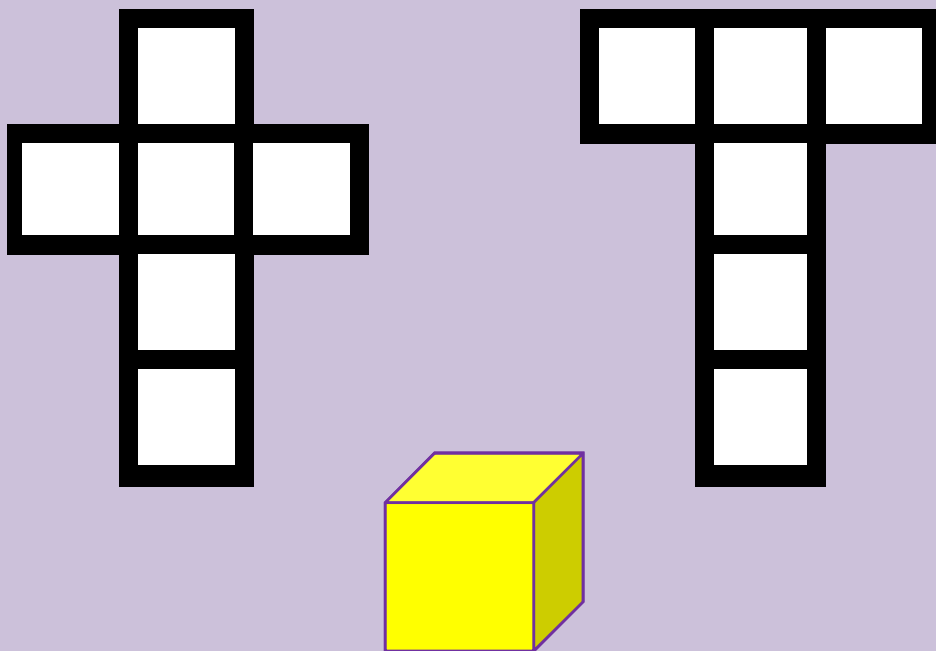


NEPRAVILEN

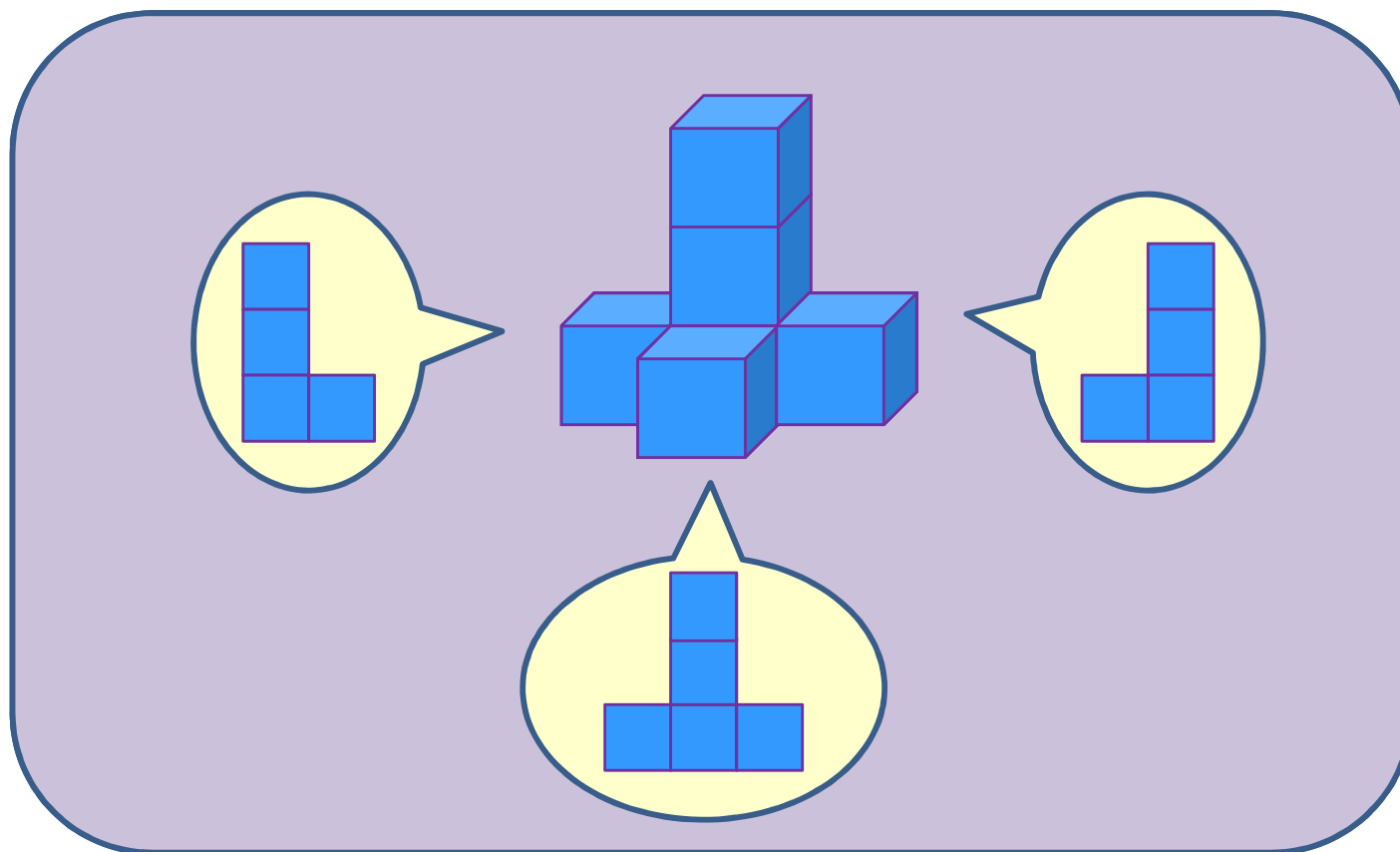


ALI LAHKO OBA LIKA PREPOGNEŠ PO ČRTAH IN IZ NJIJU SESTAVIŠ KOCKO?

DA

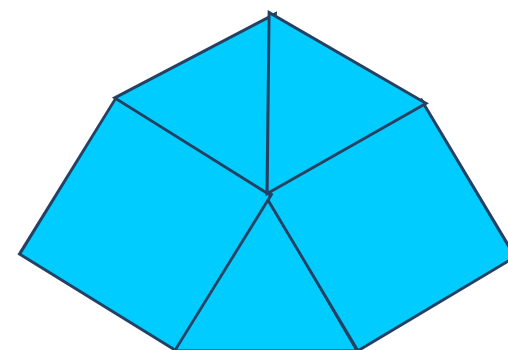
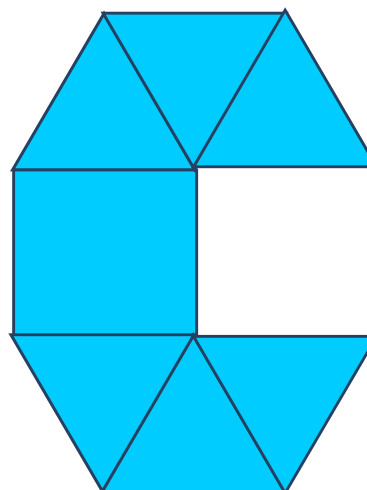
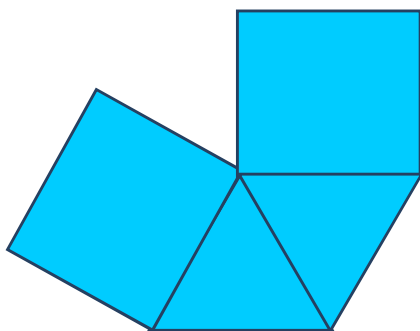
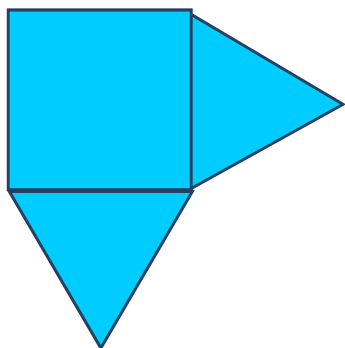
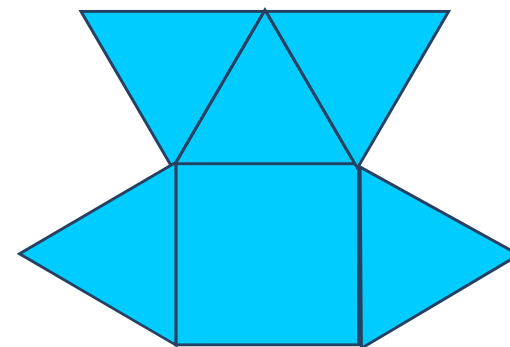
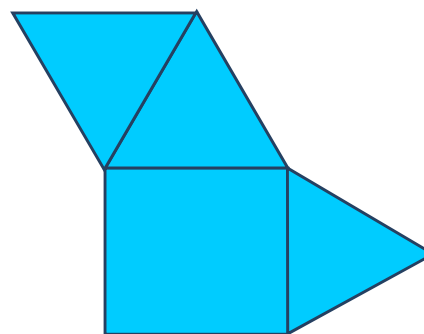
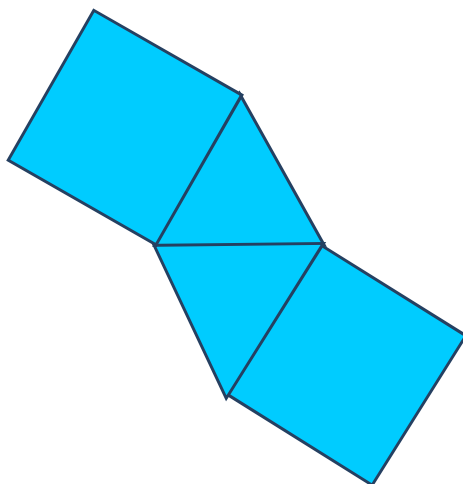
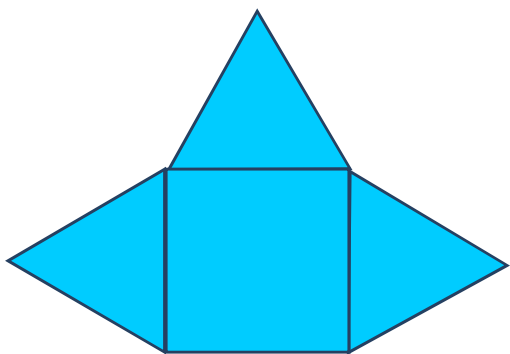


★ NARIŠI, KAKO VIDIŠ TELO, ČE STOPIŠ NA NJEGOVO LEVO ALI DESNO ALI SPREDAJ.



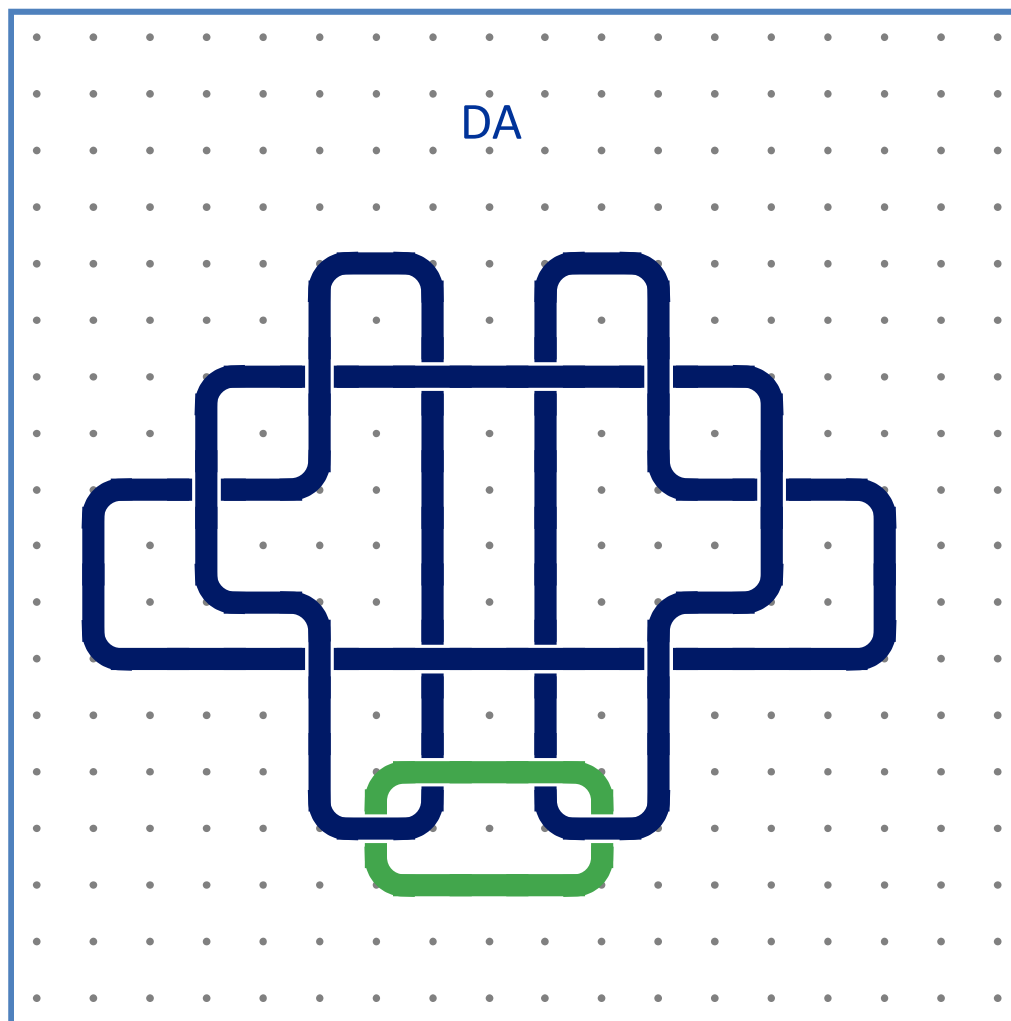


LIKE SPODAJ SESTAVI IZ KVADRATOV IN ENAKOSTRANIČNIH TRIKOTNIKOV.



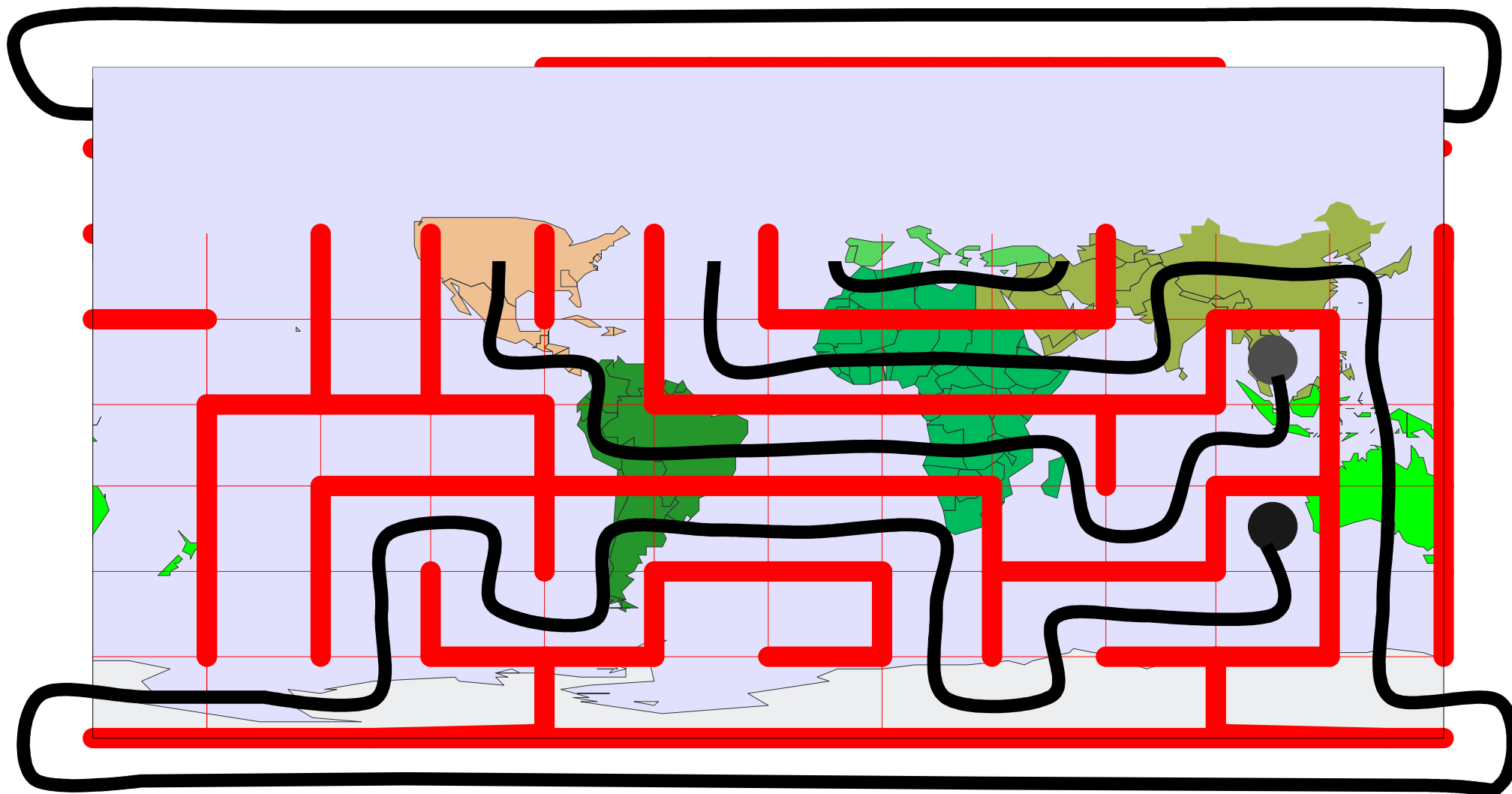


ALI LAHKO ODVOZLAŠ ELASTIKO (ZELENE BARVE) Z ŽICE (MODRE BARVE)?
ŽICA JE TRDNA.



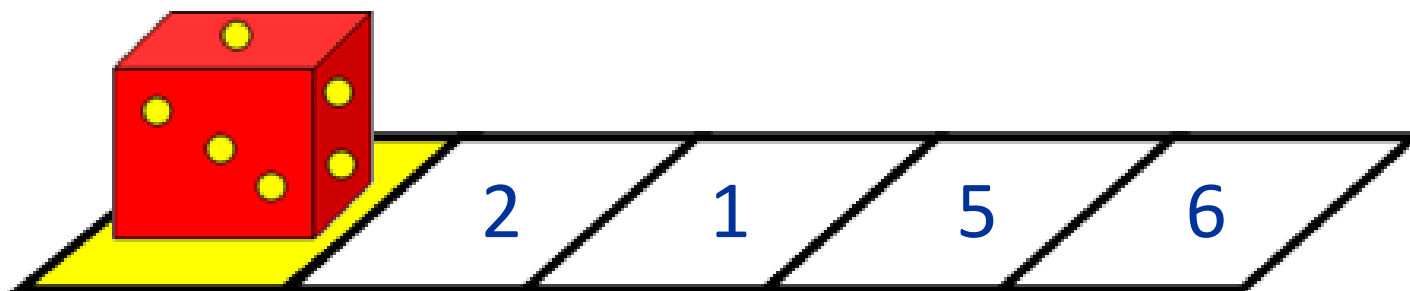
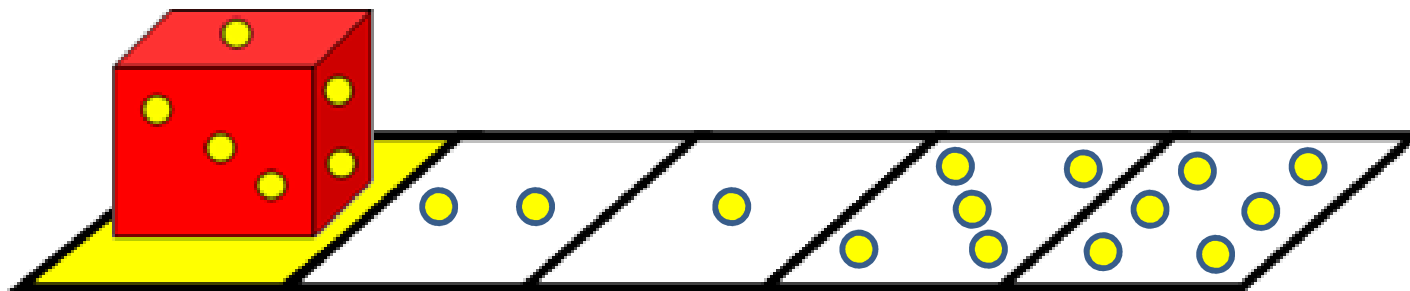


POIŠČI POT SKOZI LABIRINT OD ENE DO DRUGE PIKE.
Z ENEGA POLJA GREŠ LAHKO NA SOSEDNJE POLJE LE, ČE MEJA MED NJIMA NI
OZNAČENA Z ODEBELJENO ČRTO.

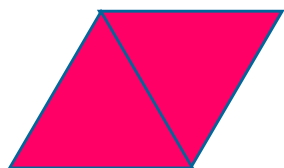




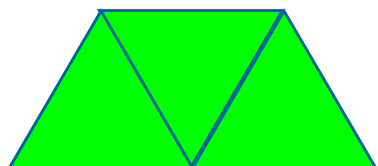
NA VSAKEM POLJU TRAKU OZNAČI SLEDI PIK IGRALNE KOCKE, KI SE KOTALI PO TRAKU. SEŠTEVEK PIK NA NASPROTNIH MEJNIH PLOSKVAH IGRALNE KOCKE JE 7.



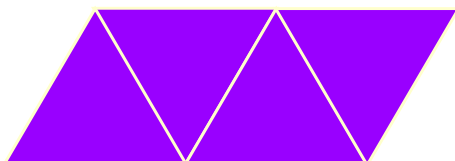
★ LIKE SPODAJ SESTAVI IZ TRIKOTNIKOV.



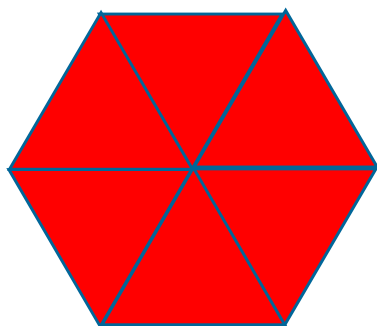
ROMB



TRAPEZ

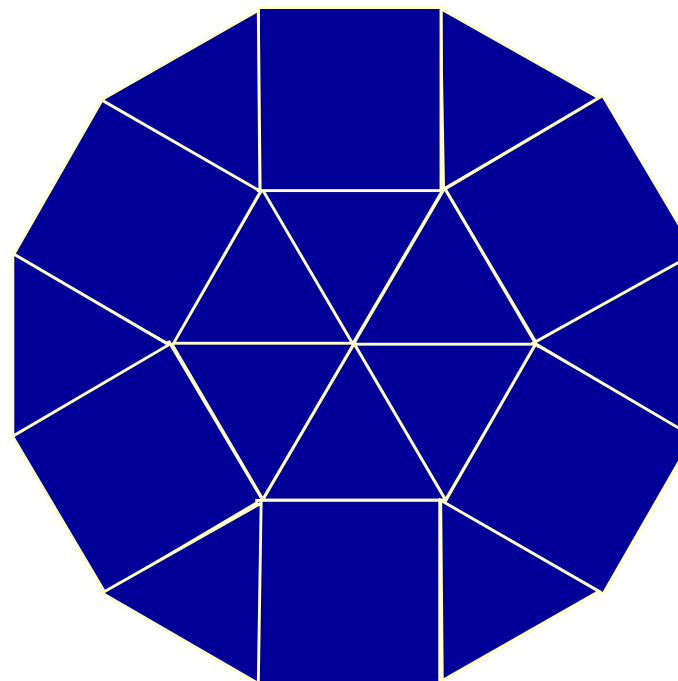


PARALELOGRAM



PRAVILNI ŠESTKOTNIK

★ LIK SPODAJ SESTAVI IZ TRIKOTNIKOV IN KVADRATOV. TRIKOTNIKI NAJ IMAJO VSE STRANICE ENAKO DOLGE KOT JE STRANICA KVADRATA.



PRAVILNI DVANAJSTKOTNIK

NALOGE ZA TRETJEŠOLCE

REŠITEV

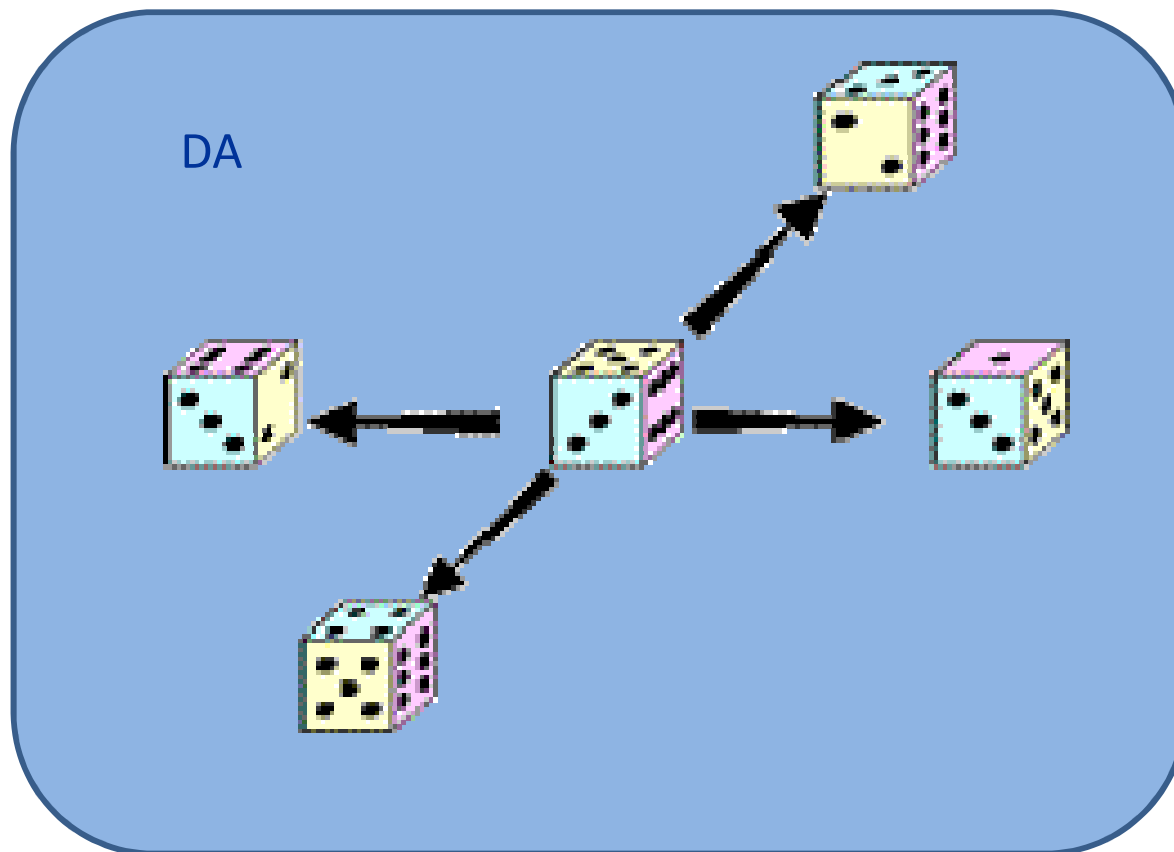


Kocka
Mejna ploskev
Rob
Oglišče
Mreža

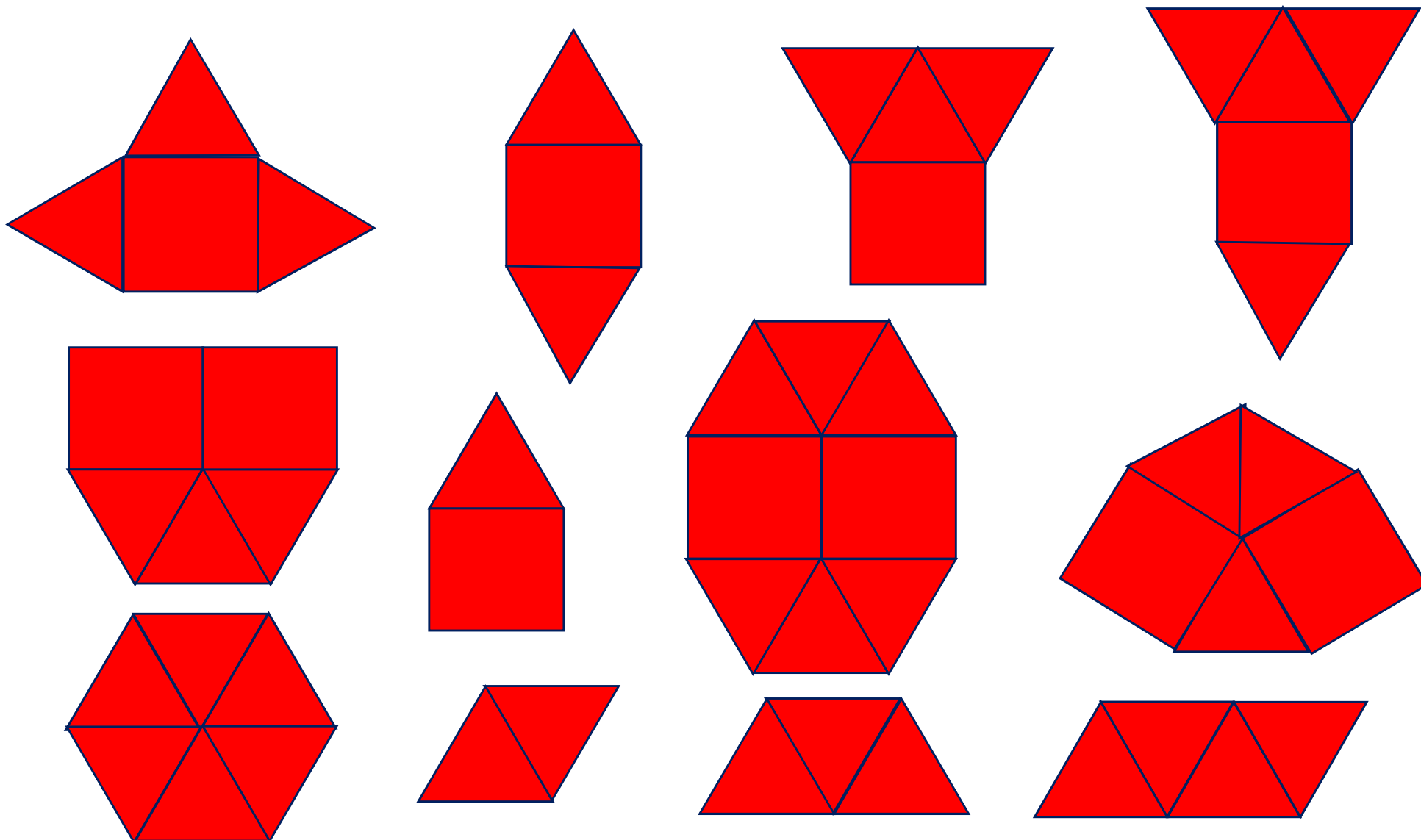




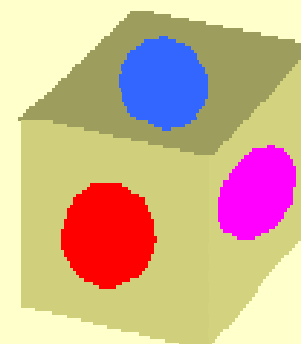
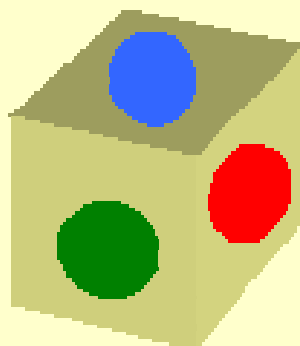
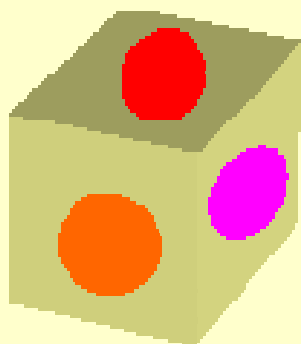
Seštevek pik na nasprotnih mejnih ploskvah kocke je 7. Puščica predstavlja kotaljenje kocke preko roba v določeni smeri.
Je slika pravilna?



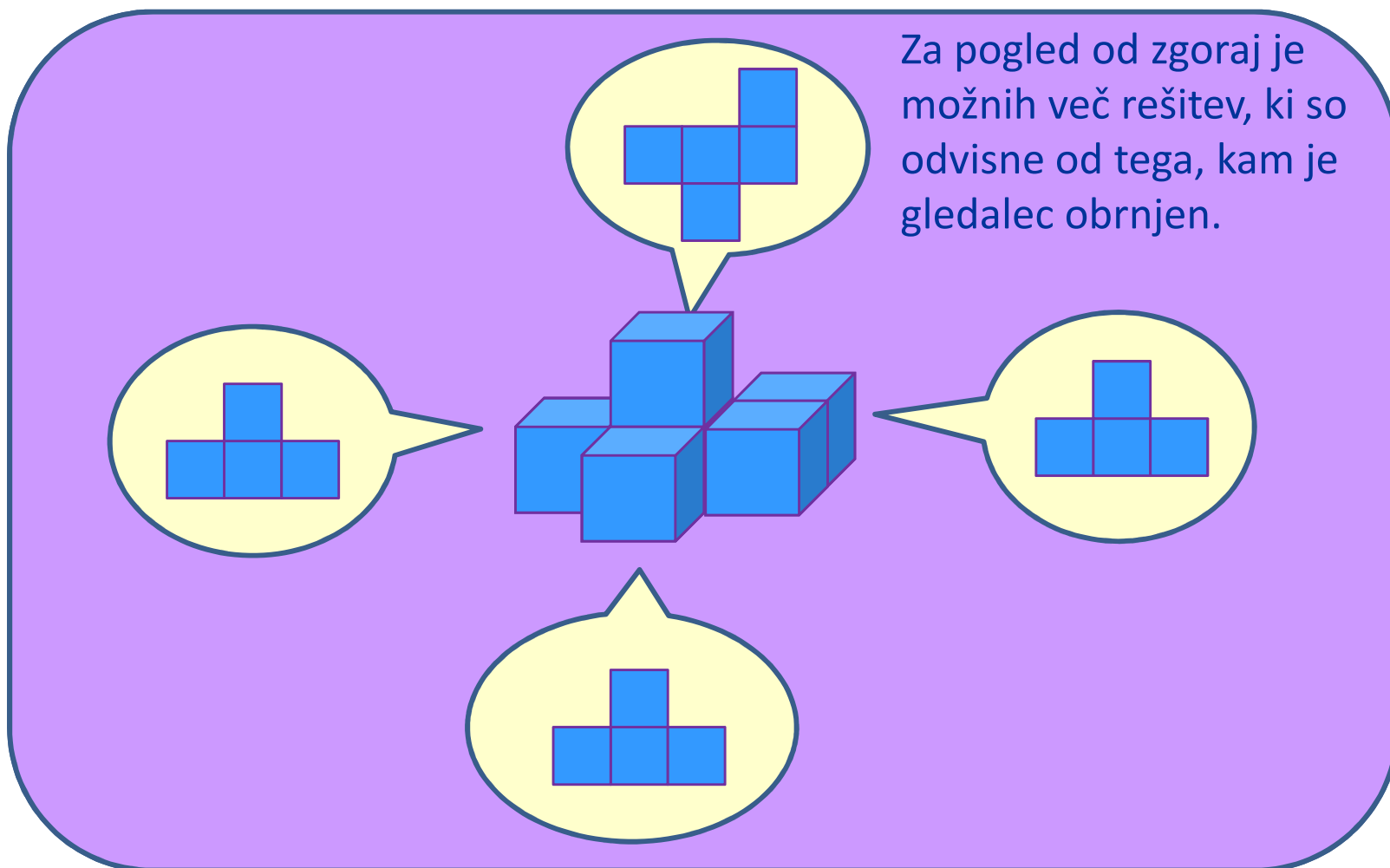
★ Like spodaj sestavi iz trikotnikov in kvadratov, ki imajo vse stranice enako dolge.



- ★ Katera barva pike je na mejni ploskvi kocke, ki je nasproti mejne ploskve z zeleno piko? VIJOLIČNA
- ★ Katera barva pike je na mejni ploskvi kocke, ki je nasproti mejne ploskve z modro piko? ORANŽNA



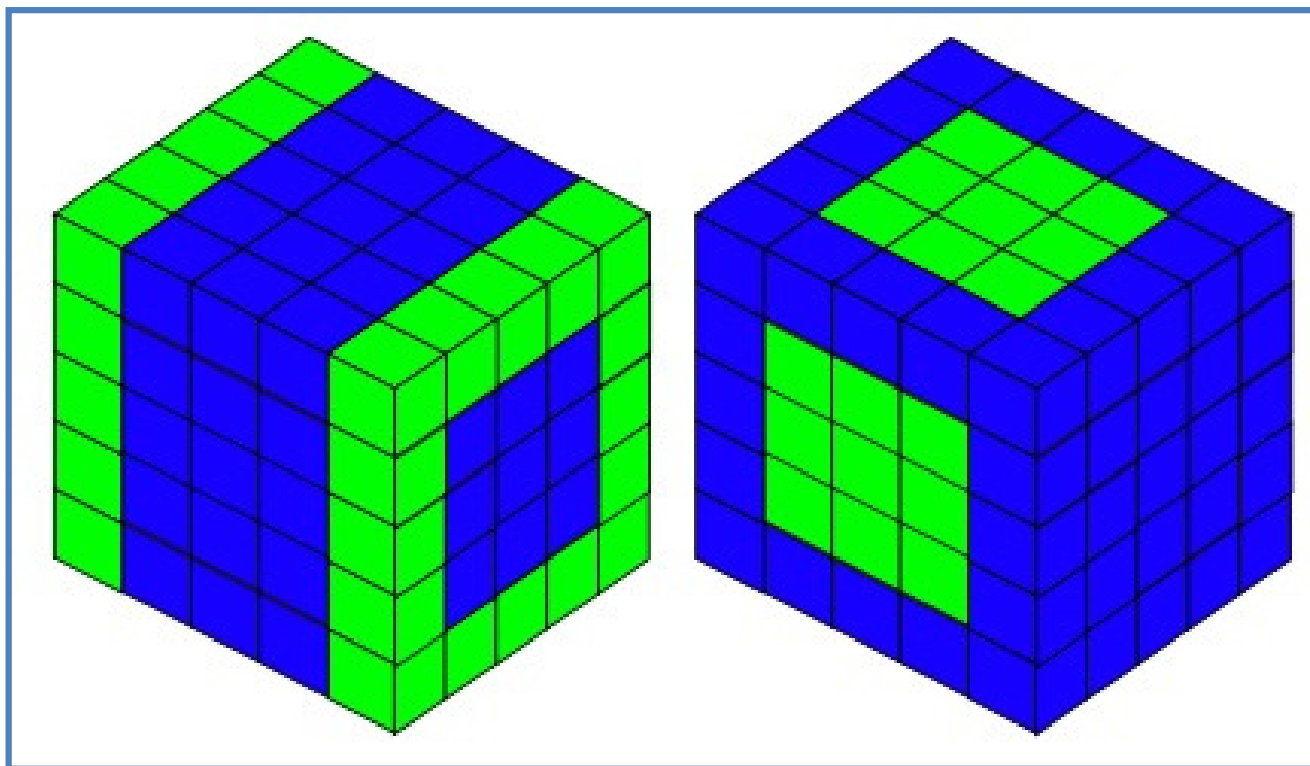
- ★ Nariši, kako vidiš telo, če stopiš na njegovo levo, desno stran, spredaj ali zgoraj.



Za pogled od zgoraj je možnih več rešitev, ki so odvisne od tega, kam je gledalec obrnjen.



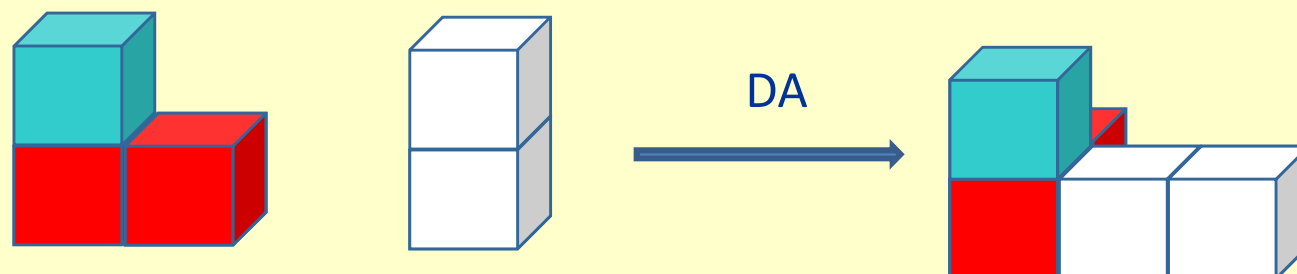
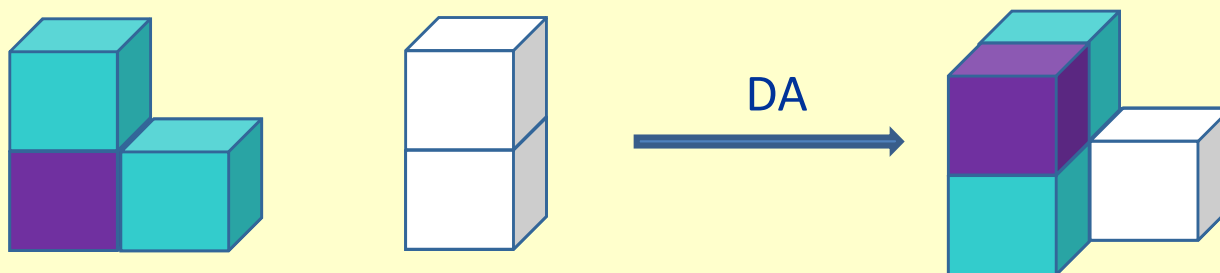
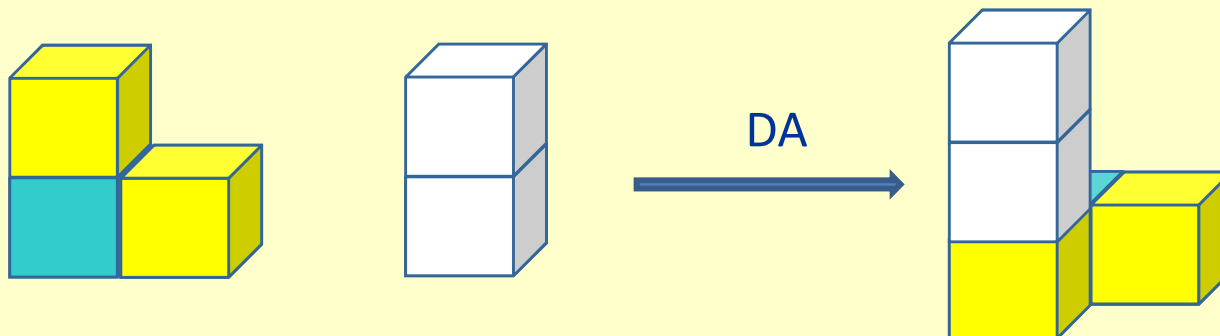
Koliko zelenih in koliko modrih kock je na vsaki od spodnjih slik?
Vsaka od kock ima enake 4 mejne ploskve, enaki sta tudi preostali dve mejni ploskvi.



32 ZELENIH
93 MODRIH (125 – 32)

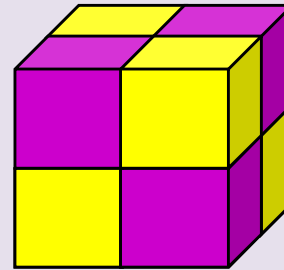
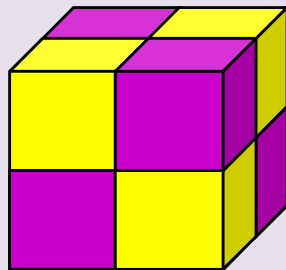
62 ZELENIH
63 MODRIH (125 – 62)

★ Preveri, ali lahko iz levih dveh teles sestaviš desno. Pomembne so tudi barve.





Vsaka od kock je sestavljena iz 8 kock, 4 so rumene in 4 vijolične. Sosednji kocki sta različne barve. Ali sta spodnji dvobarvni kocki enaki?

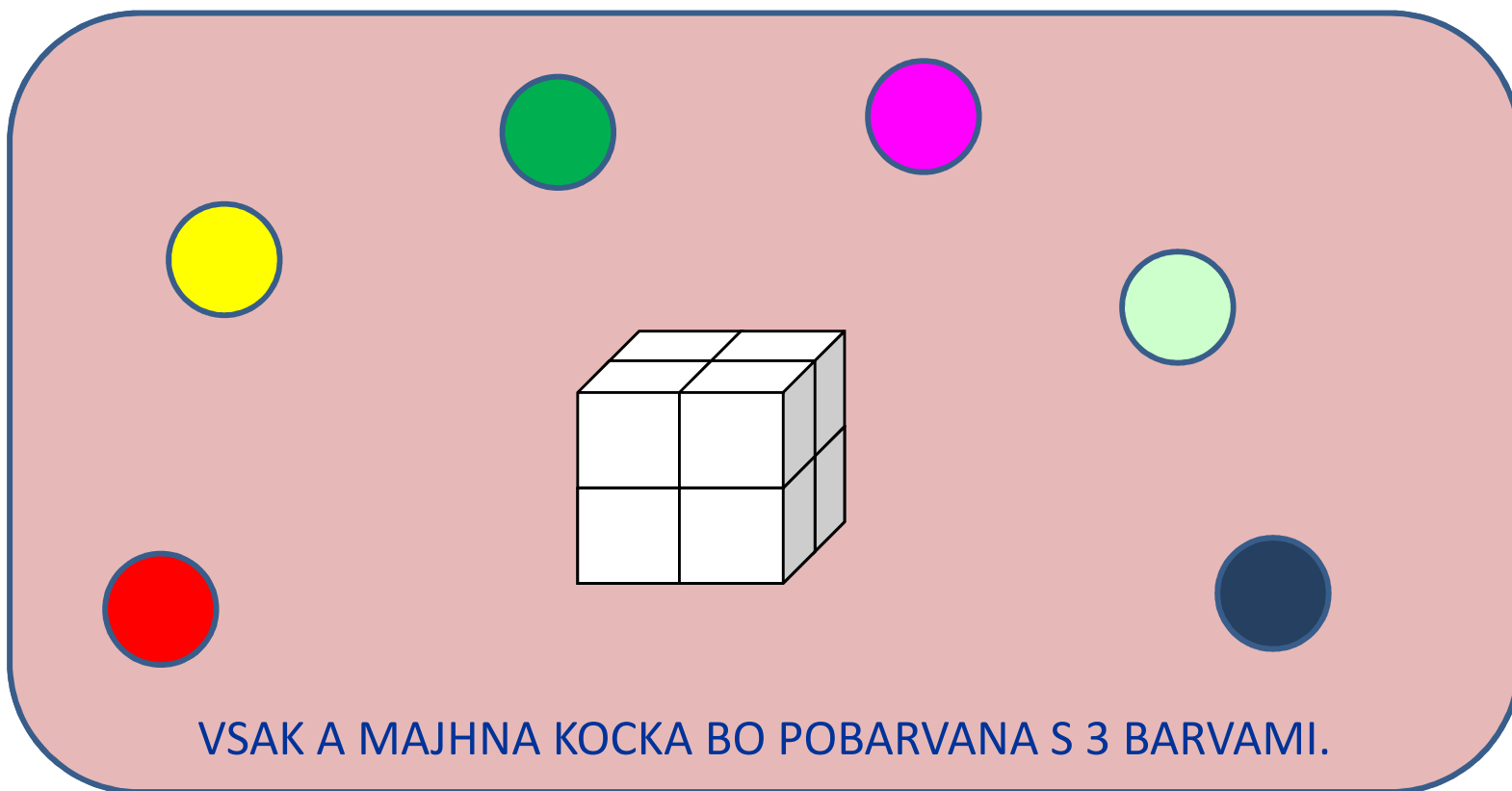


DA.

ENO OD KOCK ZAVRTIMO ZA 90 STOPINJ.



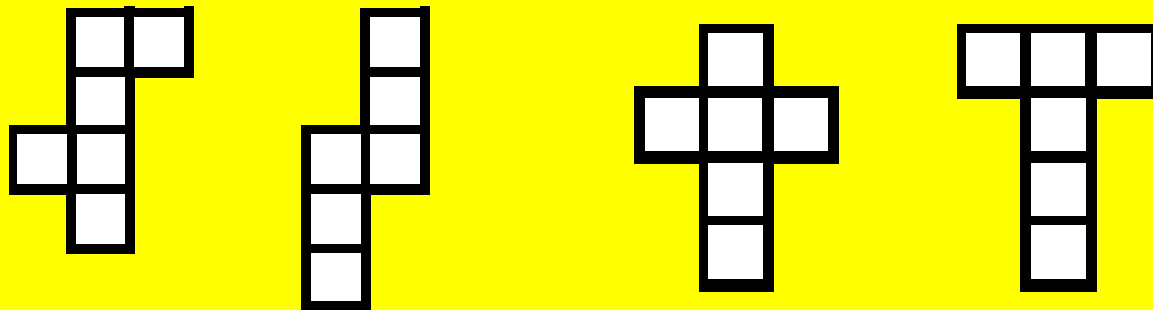
Kocko, sestavljeno iz 8 kock želimo pobarvati, tako da bo vsaka njena mejna ploskev druge barve. S koliko barvami bo pobarvana vsaka od majhnih kock, ki sestavljajo večjo kocko?



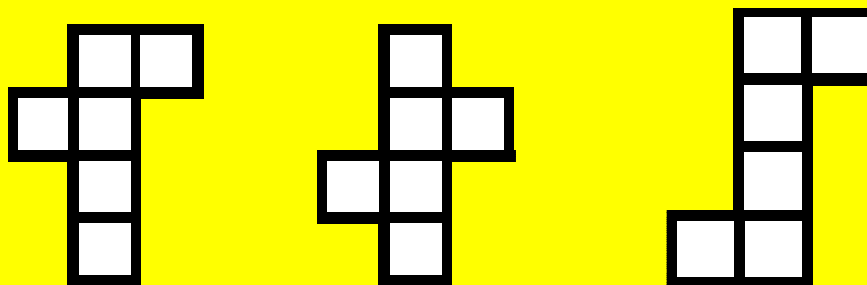


Ali lahko iz vseh spodnjih sedmih likov, ki jih prepogibaš po črtah, sestaviš kocko?

(Ali lahko iz vseh mrež sestaviš kocko?)

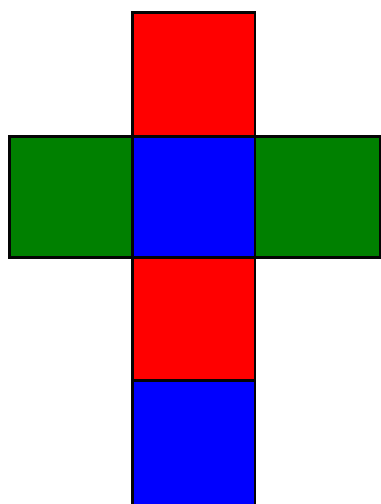


DA

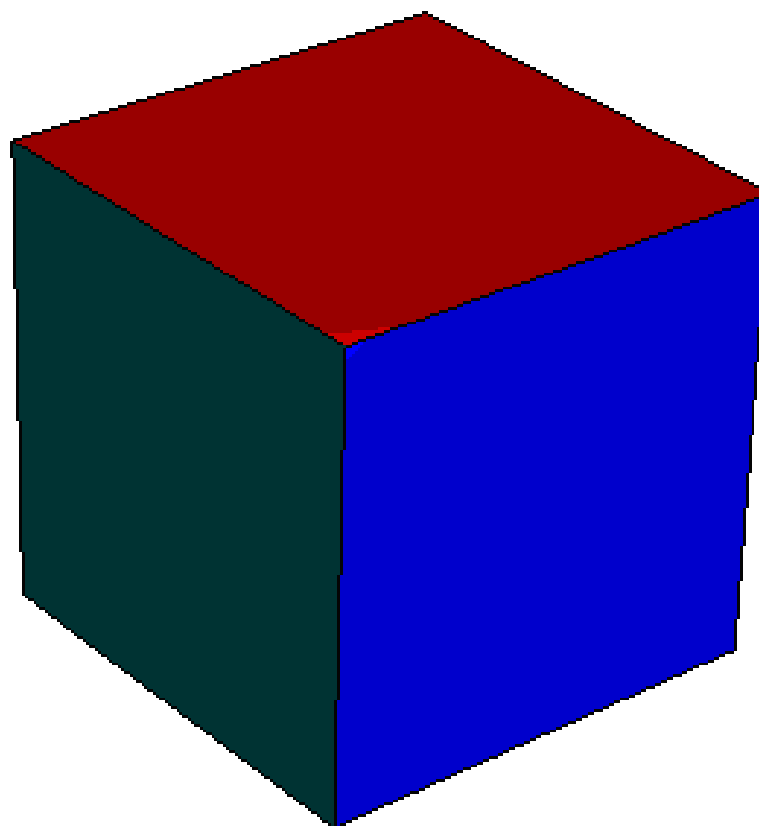




Ali ima kocka nasprotni mejni ploskvi pobarvani enako?

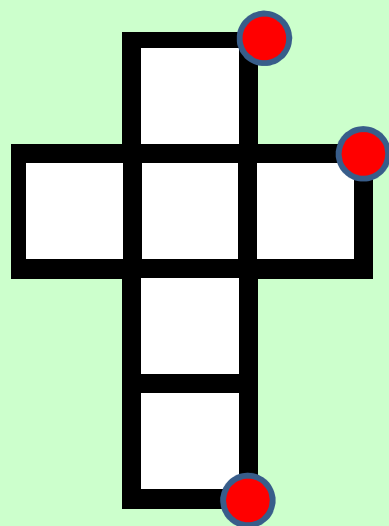


DA

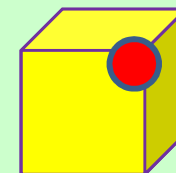
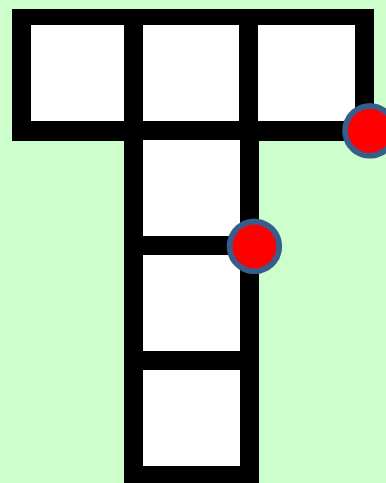


- ★ Ali rdeče pike na vsaki od obeh mrež kocke označujejo skupno oglišče kocke?

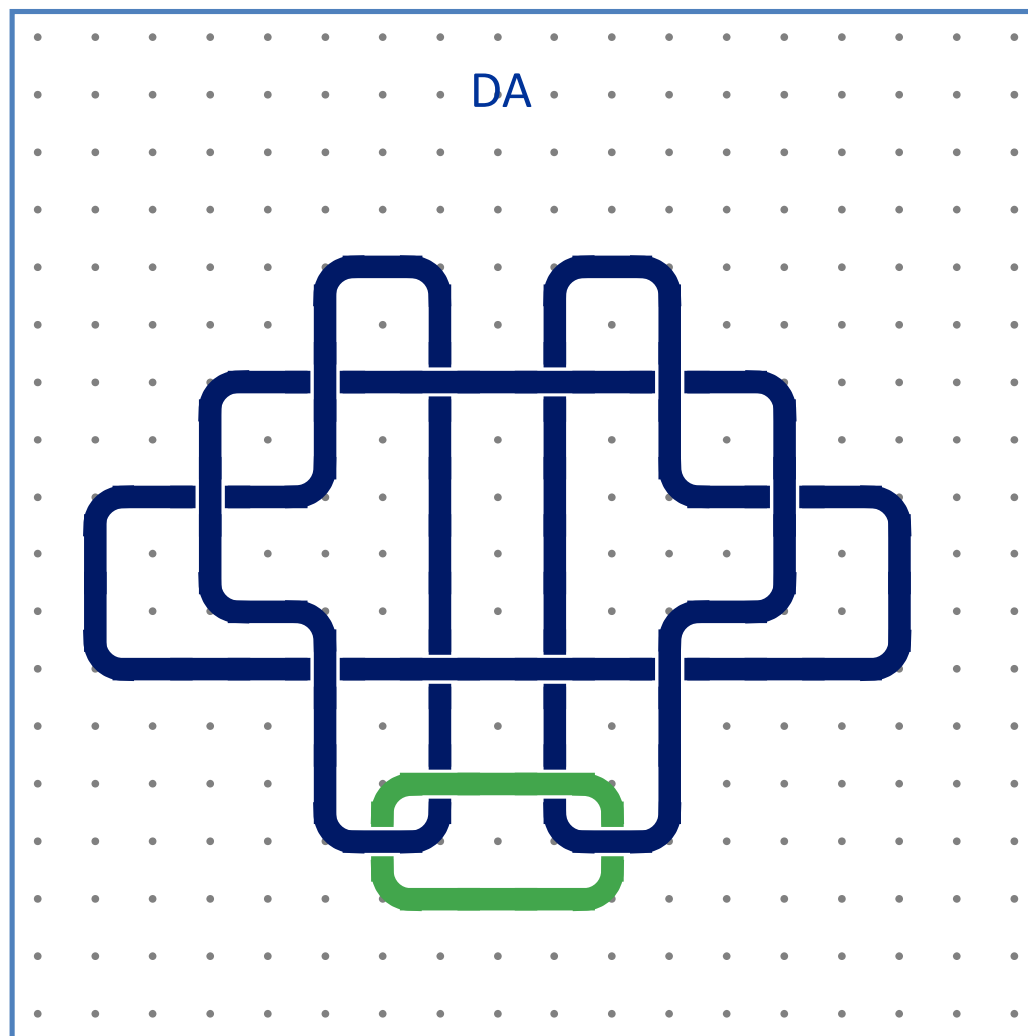
DA



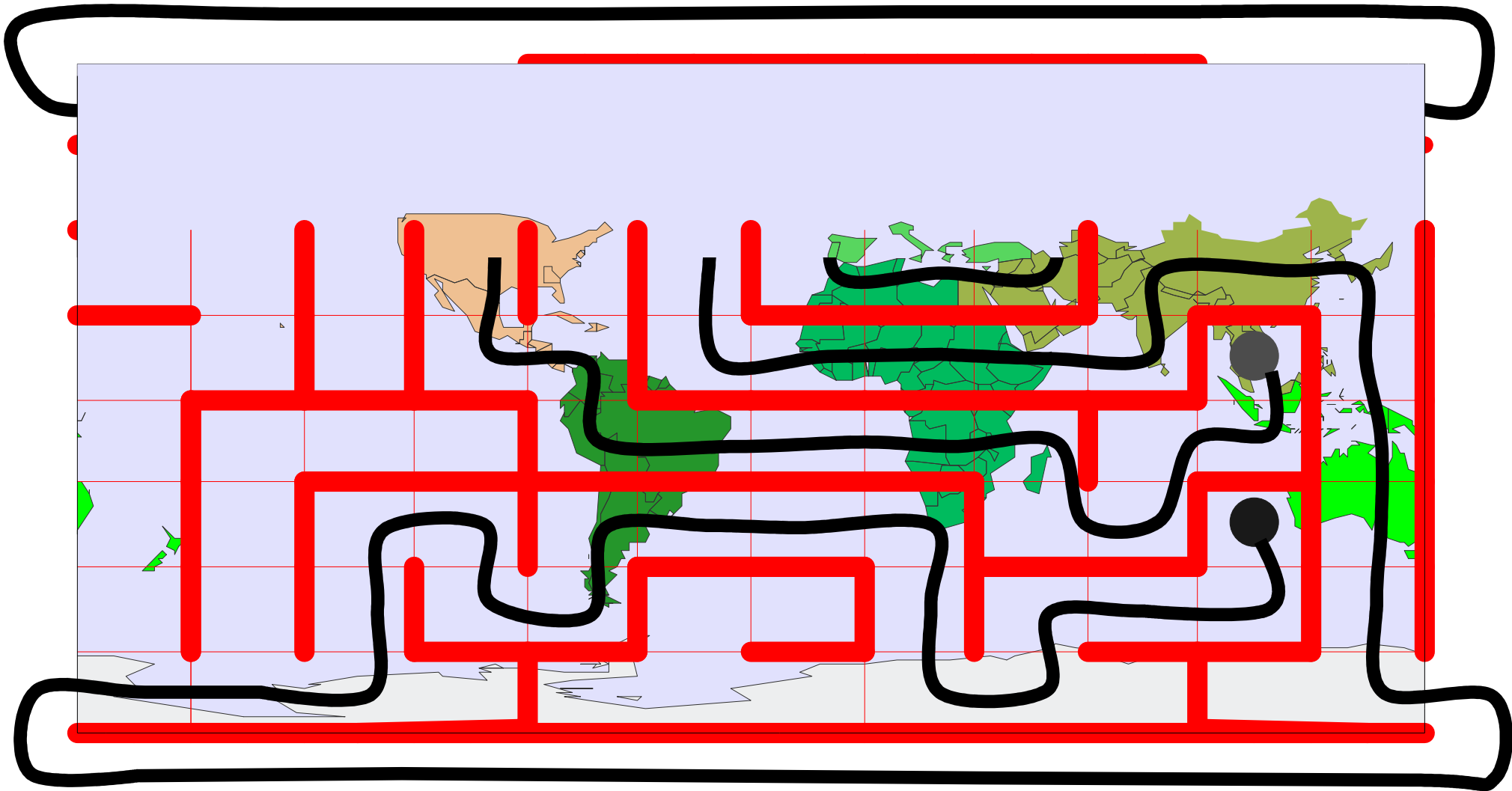
DA



- ★ Ali lahko odvozlaš elastiko (zelene barve) z žice (modre barve), ki je ne moreš upogibati?

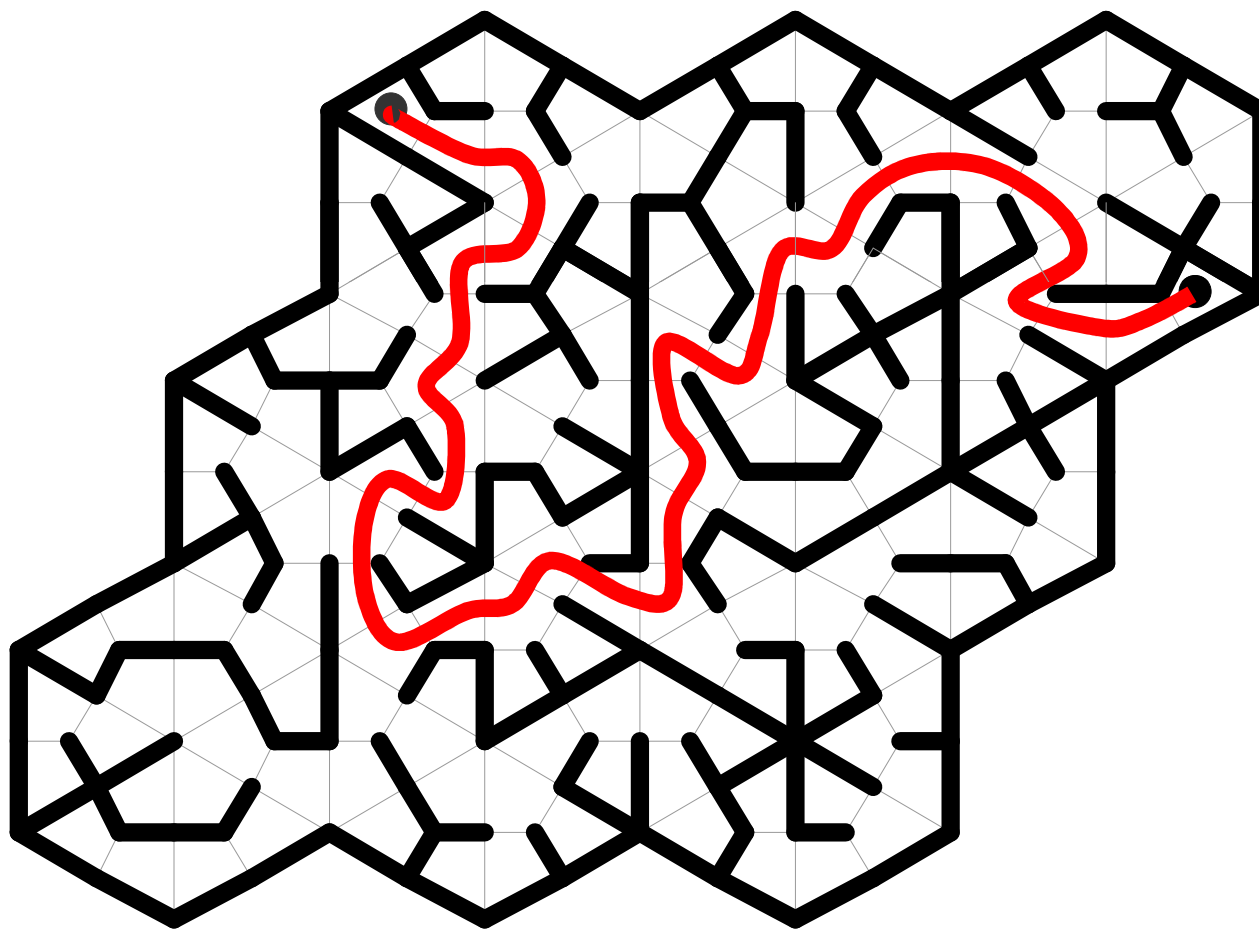


- ★ Poišči pot od ene do druge pike.
Z enega polja greš lahko neposredno na sosednje polje le, če meja med njima ni označena z odebeljeno črto.





Poišči čim krajšo pot skozi labirint od ene do druge pike.



NALOGE ZA ČETRTOŠOLCE

REŠITEV



Kocka

Kvader

Četverec (tetraeder)

Mejna ploskev

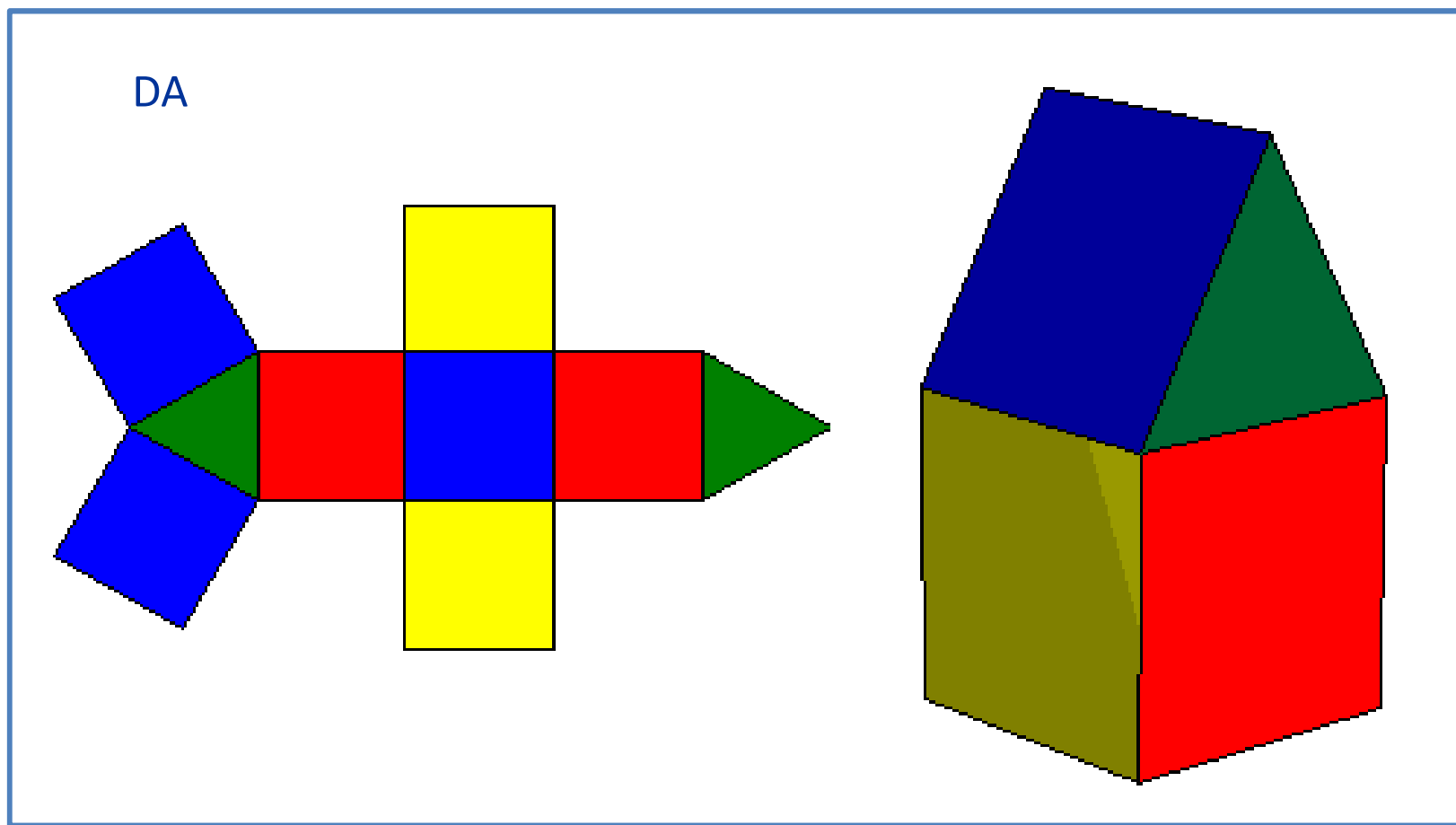
Rob

Oglišče

Mreža



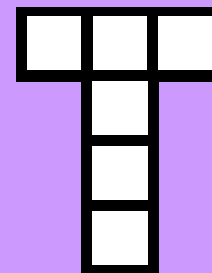
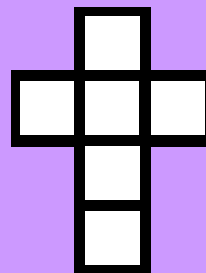
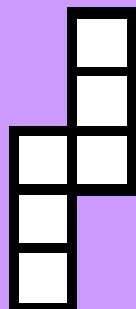
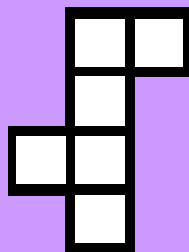
- ★ Ali lahko sestaviš hiško na desni iz lika (mreže), ki je narisano na levi?



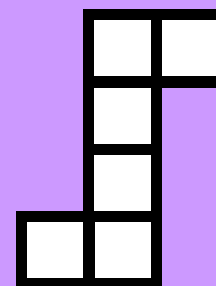
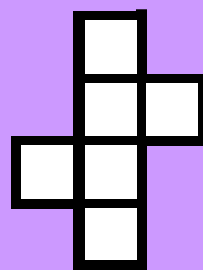
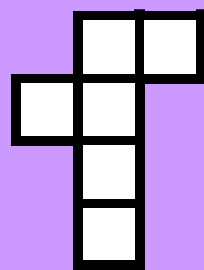


Ali lahko iz vseh spodnjih sedmih likov, ki jih prepogibaš po črtah, sestaviš kocko?

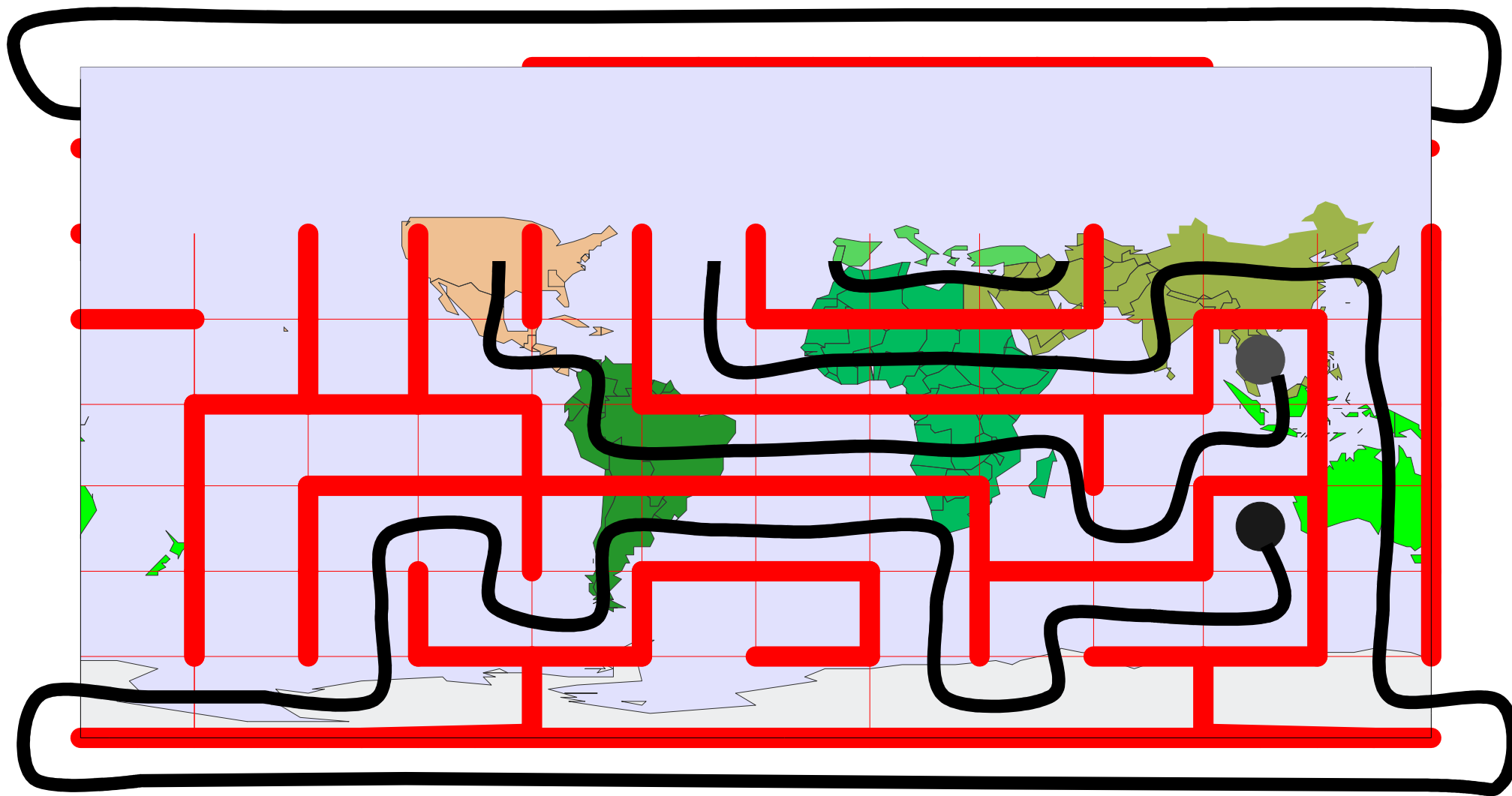
(Ali lahko iz vseh mrež sestaviš kocko?)



DA

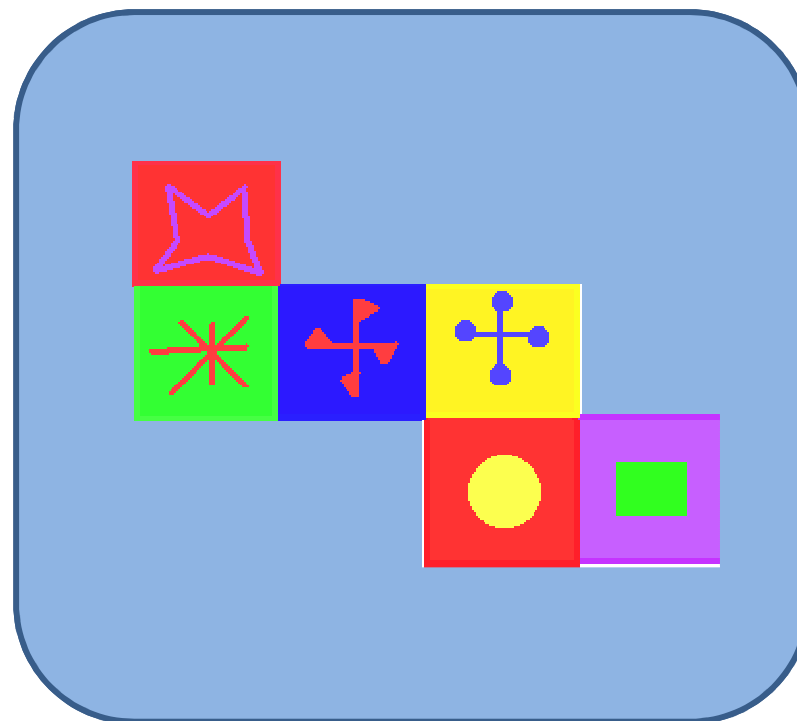
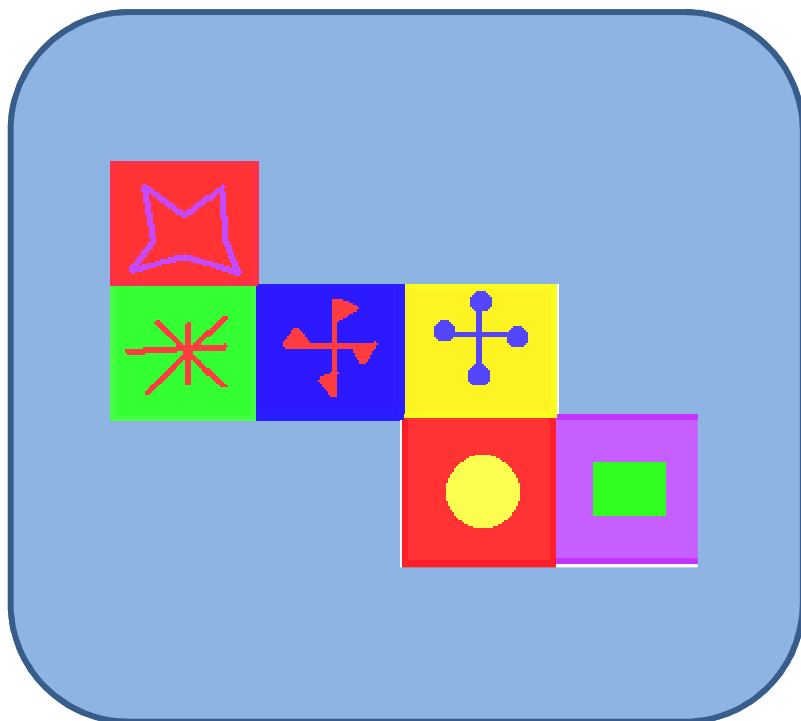


- ★ Poišči pot od ene do druge pike.
Z enega polja greš lahko neposredno na sosednje polje le, če meja med njima ni označena z odebeljeno črto.

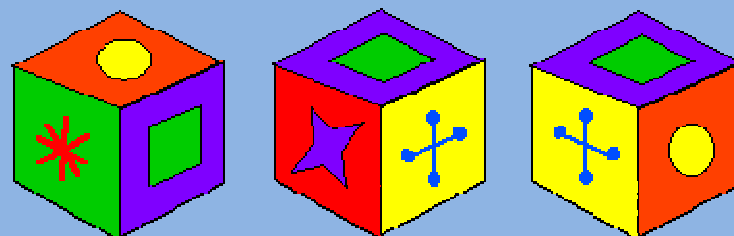
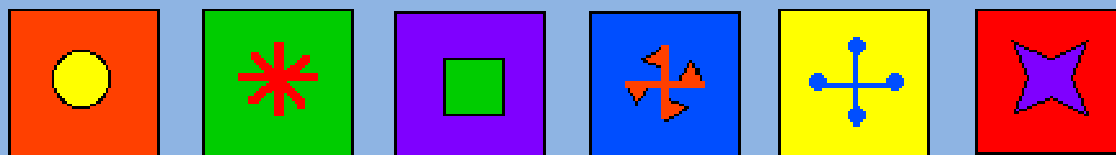


- ★ Ali dobimo enaki kocki, če mrežo kocke v prvem primeru prepogibamo tako, da je narisana ploskev v notranjosti kocke, drugič pa tako, da je le-ta njena zunanost?

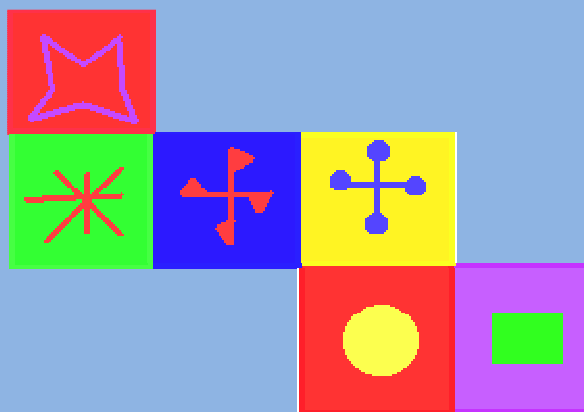
NE



- ★ Kocka ima mejne ploskve porisane s slikami, ki jih prikazujejo kvadrati spodaj. V drugi vrsti je poslikana kocka prikazana, kot jo vidimo s treh strani. Ali spodnja mreža ustreza kocki?



DA





Kocko, sestavljeno iz 27 manjših kock, želimo pobarvati, tako da bo vsaka njena ploskev druge barve. Koliko manjših kock bo pobarvanih z eno, dvema, tremi ali štirimi barvami? Najdeš tudi kocko, ki ni pobarvana?

1 BARVA: 6 KOCK (TE SO NA SREDINI PLOSKEV)

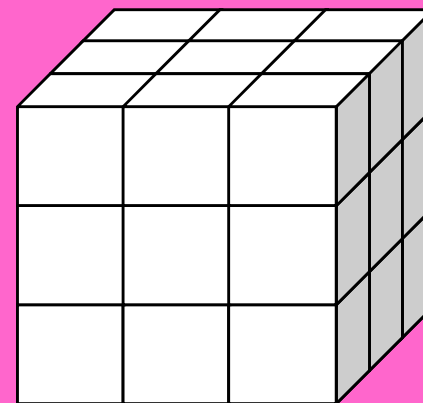
2 BARVI: 12 KOCK (TE SO NA SREDINI ROBOV)

3 BARVE: 8 KOCK (TE SO NA OGLIŠČIH KOCKE)

4 BARVE: 0

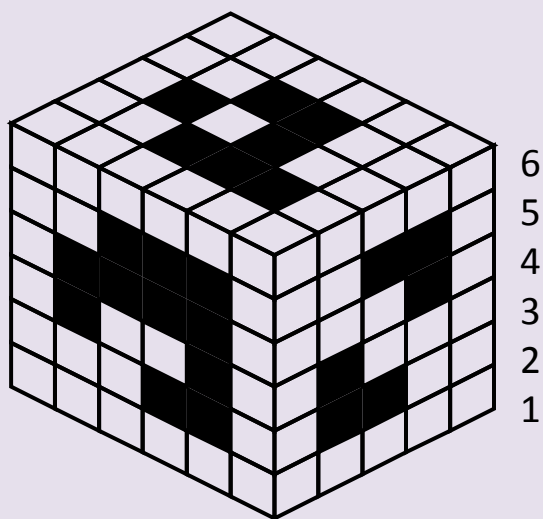
NEPOBARVANA JE 1 KOCKA (V NOTRANJOSTI)

$$6 + 12 + 8 + 0 + 1 = 27$$

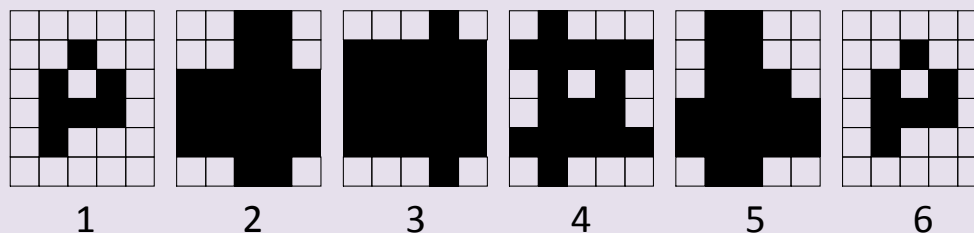


- ★ Kvader s črnimi polji razreži vodoravno na ploskve (pravokotne oblike). Na ploskvah označi črna polja. Označena črna polja kvadra segajo neprekinjeno do nasprotne mejne ploskve kvadra.

Primer:



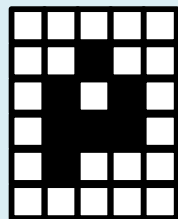
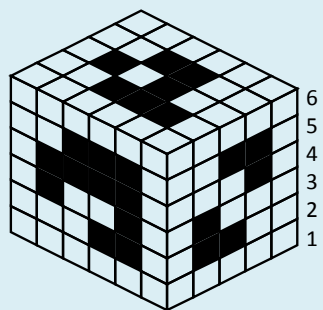
KVADER



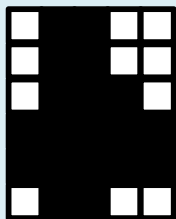
RAZREZ KVADRA



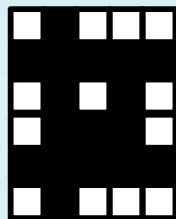
Tri naloge reši po zgledu s prejšnje strani.



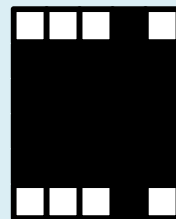
1



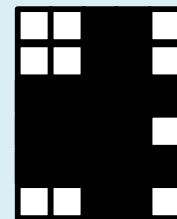
2



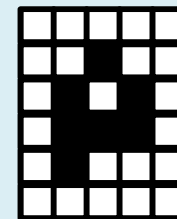
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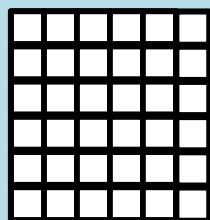
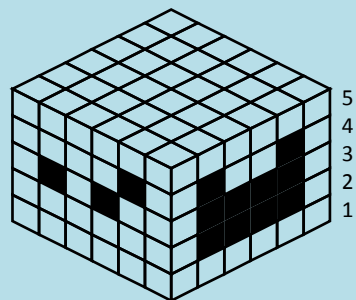
4



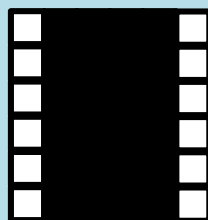
5



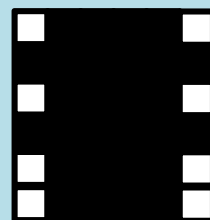
6



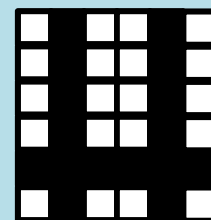
1



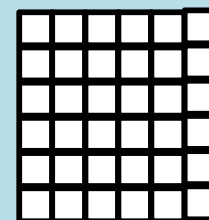
2



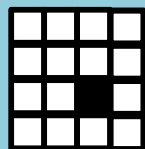
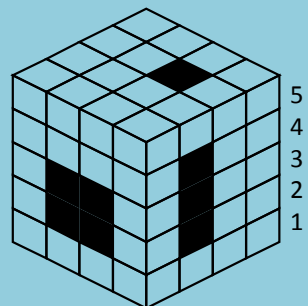
3



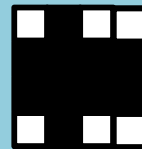
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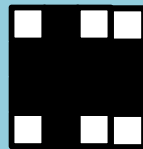
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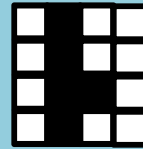
1



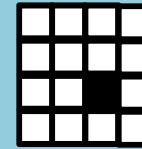
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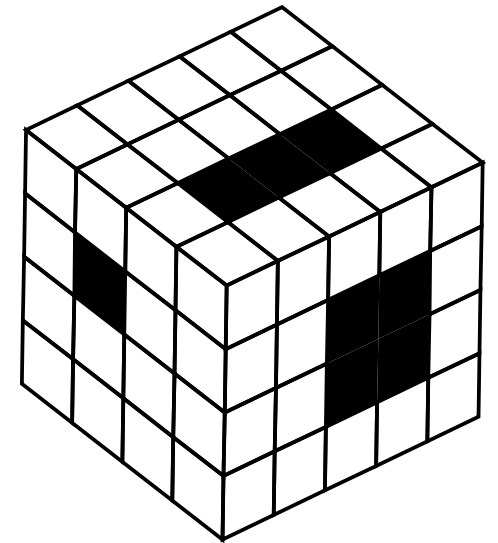
3



4



5

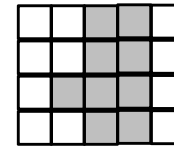
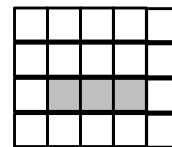


1

2

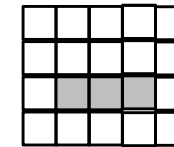
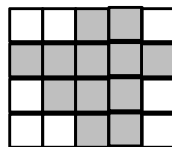
1

2



3

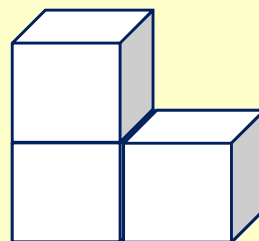
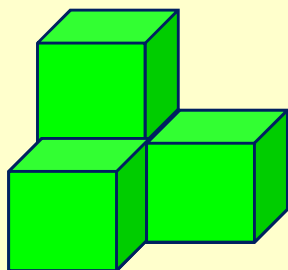
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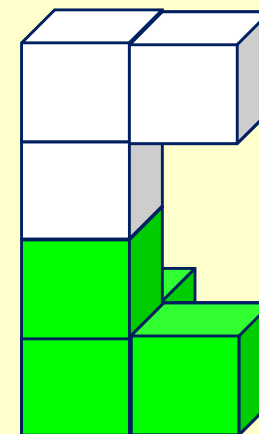
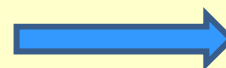
3

4

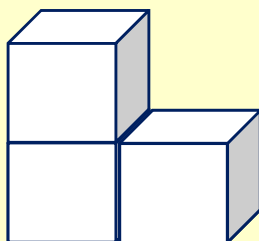
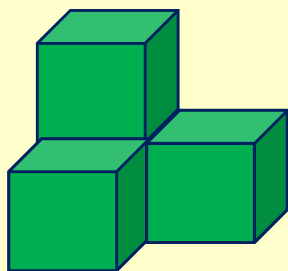
★ Ali lahko iz dveh teles na levi sestaviš telo na desni?



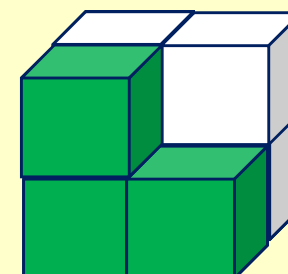
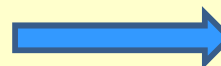
DA



NI DOLOČENO, SAJ NE VEMO, ALI JE ZA SPODNJO LEVO ZELENO
KOCKO ŠE ENA KOCKA ALI NE.

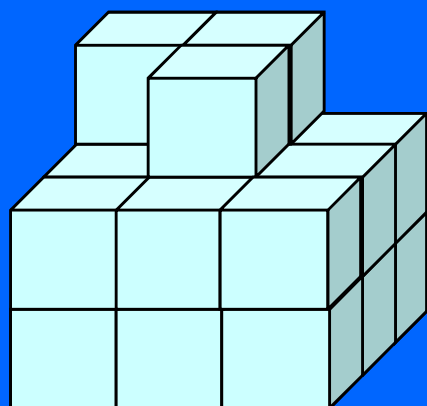


?





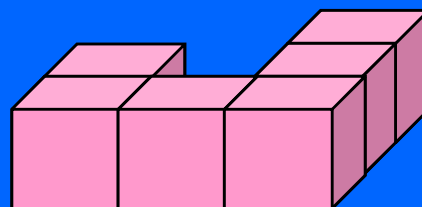
Nariši manjkajoči del?



TELO IZ KOCKIC

21

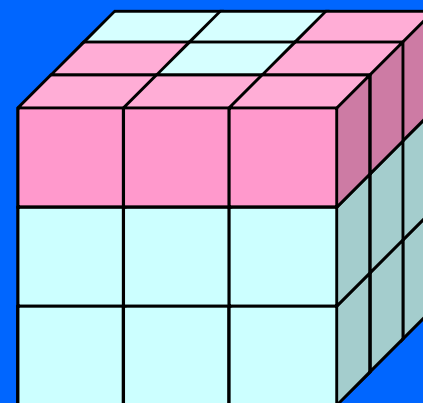
+



MANJKAJOČI DEL

6

=

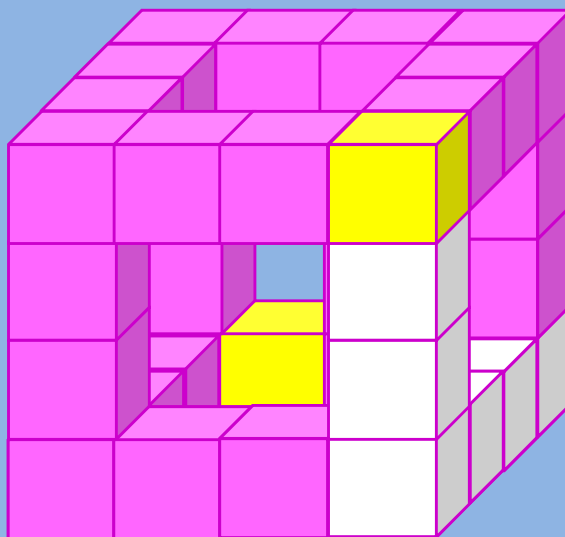


KOCKA IZ KOCKIC

27

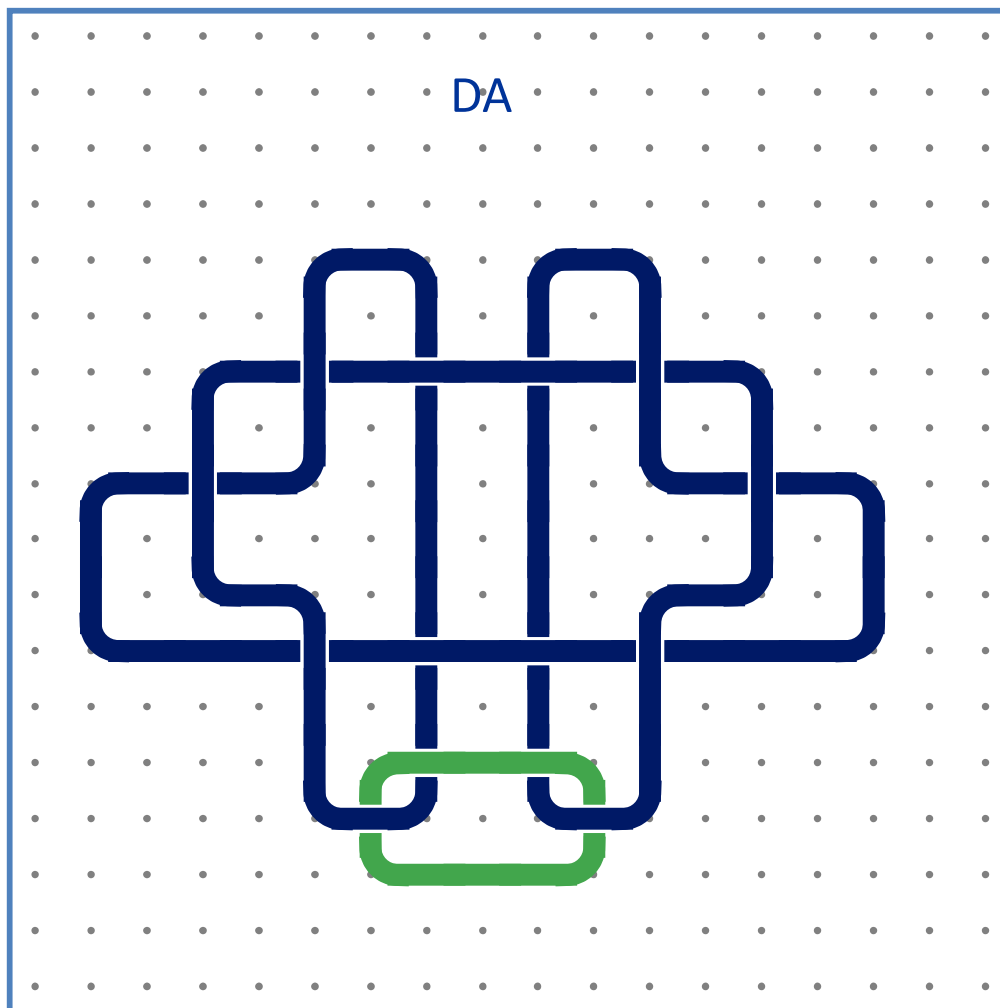
- ★ Najmanj koliko kock loči rumeni kocki (vključno z njima)?

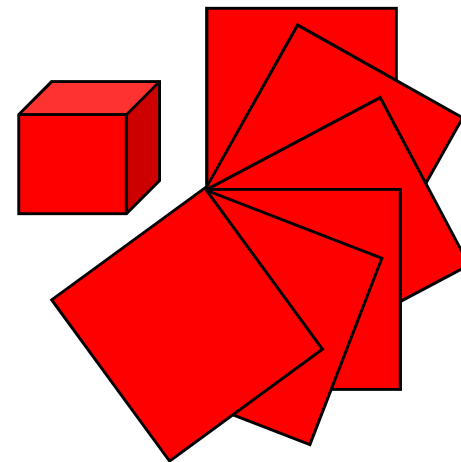
9



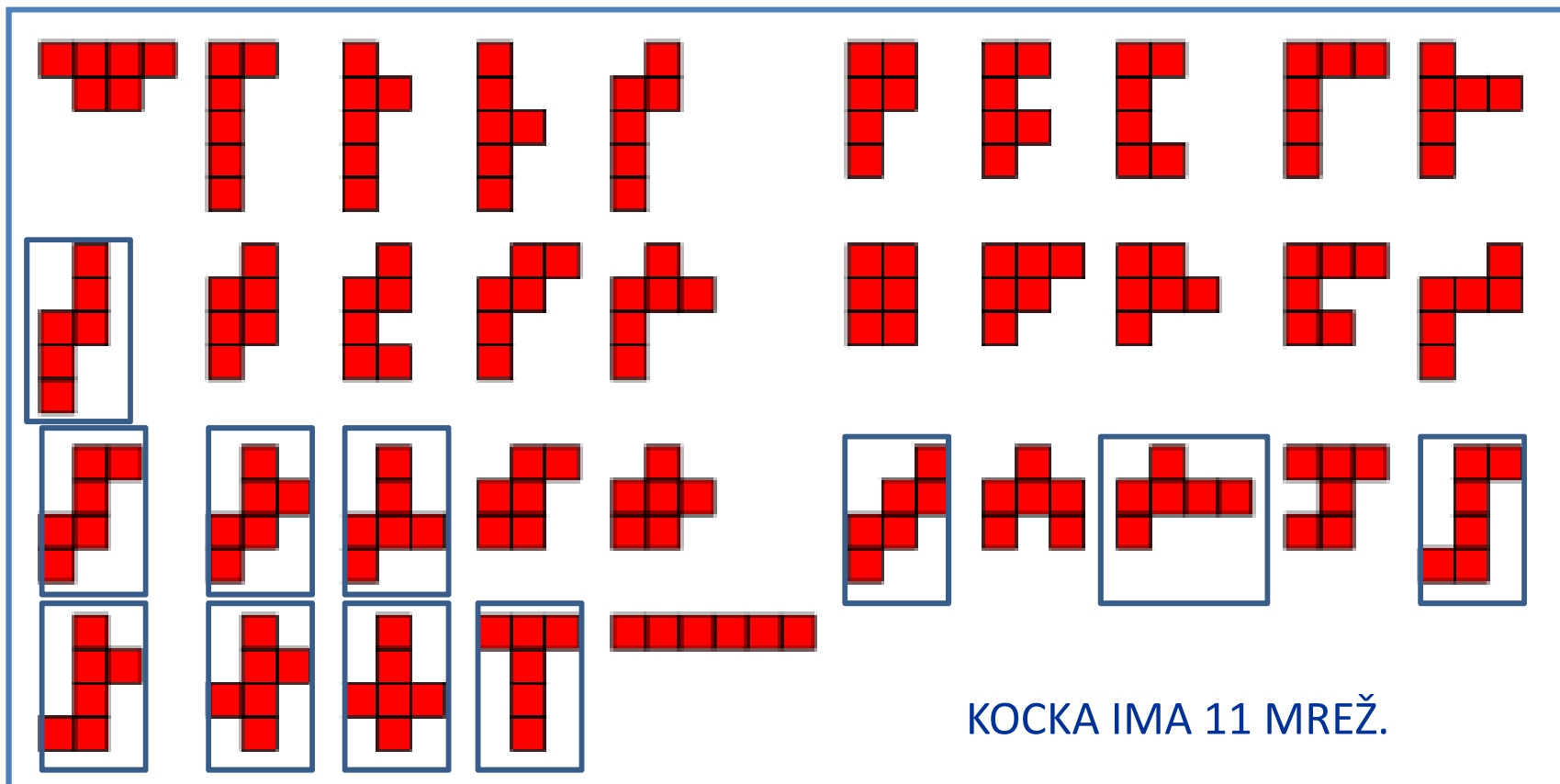


Ali lahko odvozlaš elastiko (zelene barve) z žice (modre barve), ki je ne moreš upogibati?





Katere od spodnjih likov spodaj lahko prepogneš v kocko?

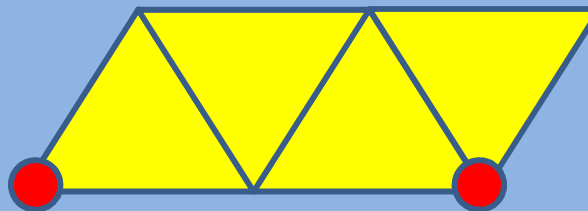
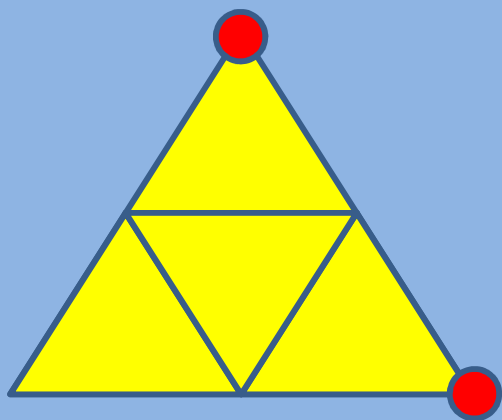
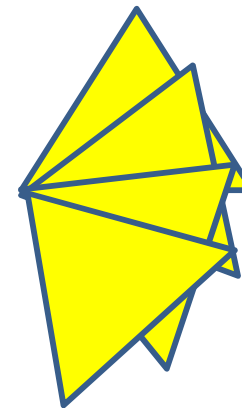




Lahko iz spodnjih mrež sestaviš četverec (tetraeder)? DA



Ali rdeče pike predstavljajo isto oglišče četverca? DA





Vsakemu telesu priredi svojo mrežo.

1

2

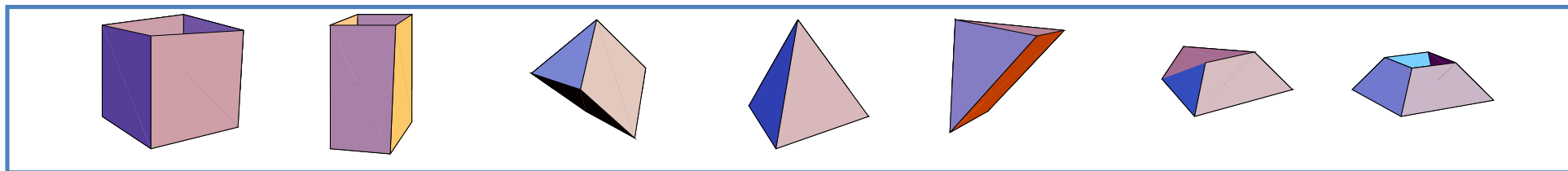
3

4

5

6

7



2

5

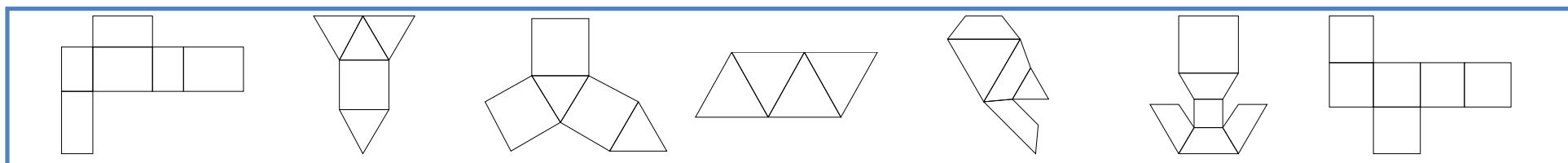
3

4

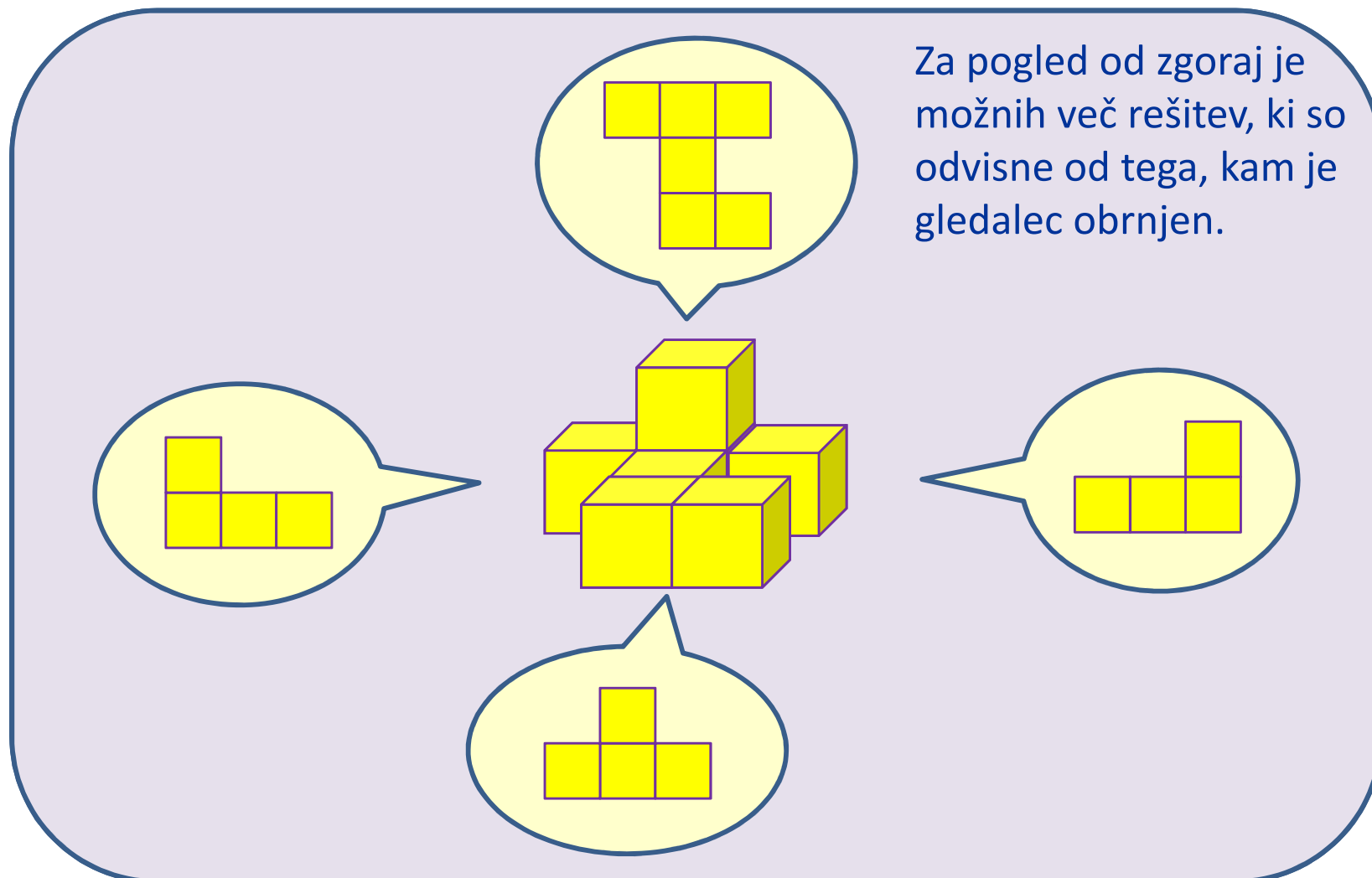
6

7

1



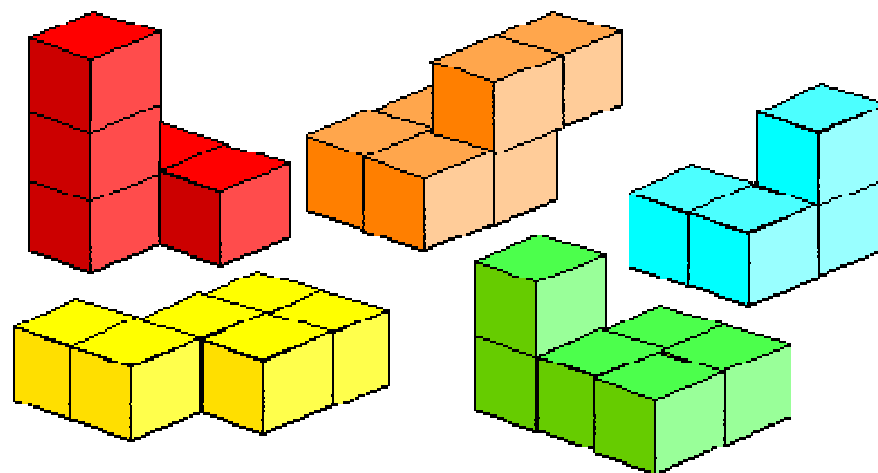
- ★ Nariši, kako vidiš telo, če ga pogledaš z leve ali desne, od zgoraj ali spredaj?



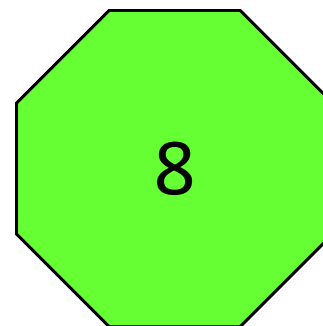
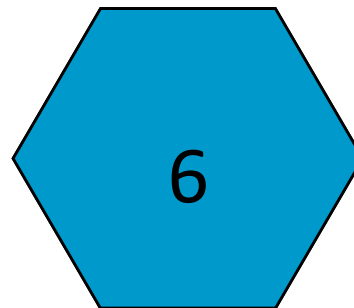
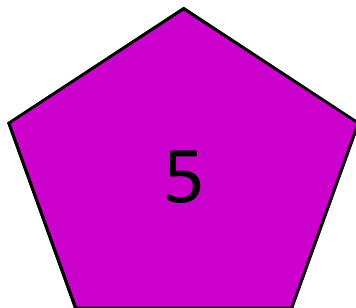
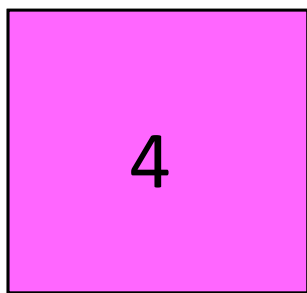
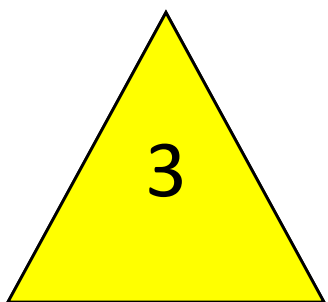
NALOGA ZA MENTORJA



Ali lahko iz spodnjih teles sestaviš kocko?



PRAVILNI LIKI



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