

Niveaux : Cycle 3 / Cycle 4

Domaine : Nombres et Calculs

Savoir-faire :

- Utiliser des fractions pour rendre compte de partages de grandeurs ou de mesures de grandeurs.
- Connaître des égalités entre des fractions usuelles.
- Décompositions additives.
- Structurer son raisonnement pour dégager des démarches efficaces.

Mais aussi : Faire des choix.

Partager une quantité en deux ou trois parts selon un ratio donné.

En anglais, les noms *Cardinal* et *Rate* signifient **cardinal** et **ratio**.

L'activité CardiRate est composée de deux parties semblables mais cependant distinctes. Cardi propose de recouvrir entièrement une grille - souvent rectangulaire - dont on précise le nombre de réglettes de chaque sorte (le cardinal) et ceci des réglettes les plus petites aux réglettes les plus grandes, sans toutefois annoncer de quelles sortes il s'agit.

Rate fait exactement la même proposition !

De fait Cardi est un ratio non simplifié.

Ainsi, par exemple, le cardi **2 ; 1** annonce clairement qu'il faut recouvrir la grille par 2 réglettes d'une sorte et 1 d'une autre (plus grande), quand le ratio **2 : 1** le propose également mais pourrait tout aussi bien amener 4 réglettes d'une sorte et 2 d'une autre ou 6 et 3 ou ...

La subtilité de codage se situe donc dans le séparateur des nombres :

; pour **Cardi**

: pour **Rate**.

Les titres des fiches sont volontairement décalés...

Kotomi inaugure **Cardi** en proposant deux grilles aidées ;

Kerkredi , des grilles rectangulaires de 3 sur 4 ;

Keudi, d'autres types de grilles ;

Kékidi, des grilles carrées pour lesquelles l'assemblage des réglettes est moins aisé ;

Kromatik, des grilles couplées par des couleurs communes ;

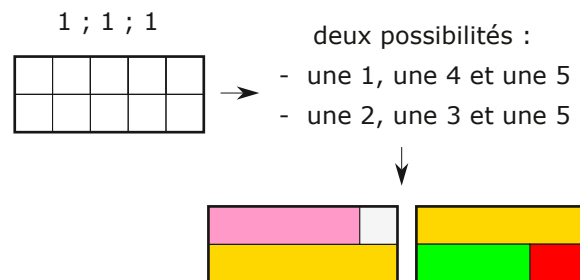
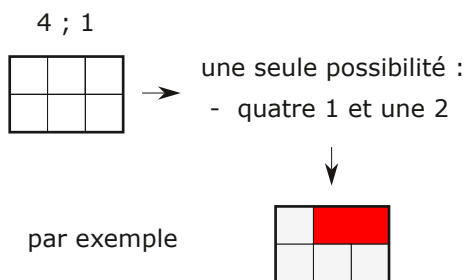
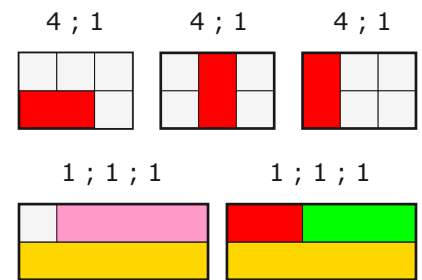
Mension 3, des pavés de dimensions connues ;

Sruptif, des pavés dont l'assemblage des réglettes est moins aisé.

La présentation des fiches **Rate** est en page 9.

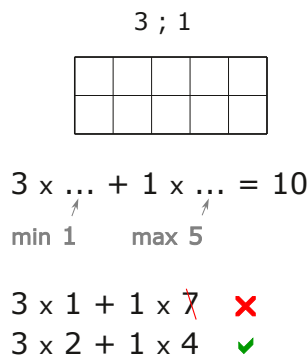
Pour une grille entièrement recouverte de **réglettes**, on indique **le nombre de chaque sorte** présente; et ceci dans l'ordre des réglettes **des plus petites aux plus grandes**, mais toutefois sans les nommer.

Réciproquement si on fournit cette indication **pour une grille vierge**, il va déjà falloir **trouver les tailles** des réglettes qui conviennent, **puis la recouvrir**.

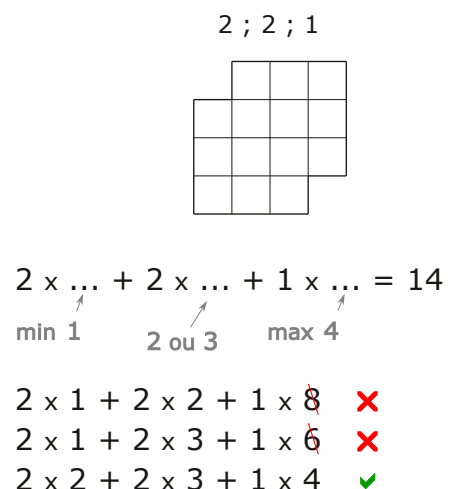
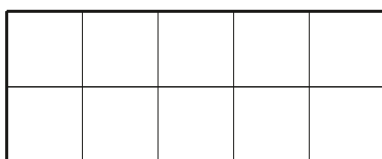


On ne tient pas compte de la disposition des réglettes.

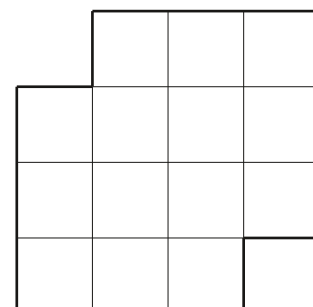
Voici deux premières grilles aidées.



- Placer trois réglettes **2** et une réglette **4**.
- En dessiner la trace en les retirant.

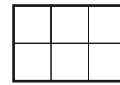


- Placer deux réglettes **2**, deux **3** et une **4**.
- En dessiner la trace en les retirant.

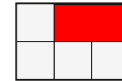


L'indication donne **combien de réglettes de chaque sorte** recouvrent entièrement la grille ; et ceci dans l'ordre **des** réglettes les **plus petites aux plus grandes**, mais sans les nommer.

4 ; 1



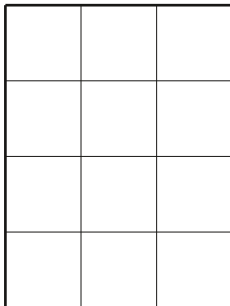
une seule possibilité :
- quatre 1 et une 2



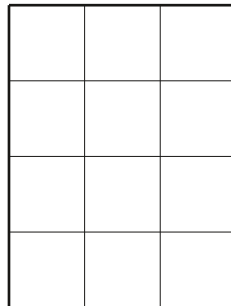
On ne tient pas compte de la disposition des réglettes.

Pour chaque grille, **réaliser un recouvrement** qui respecte l'indication, puis en laisser la trace.

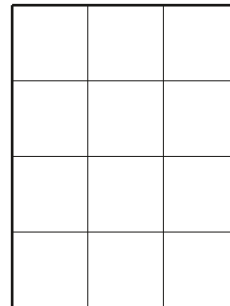
2 ; 5



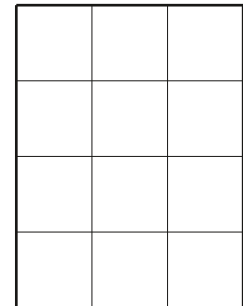
2 ; 2



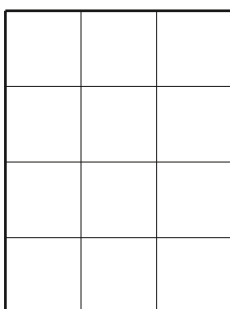
3 ; 2



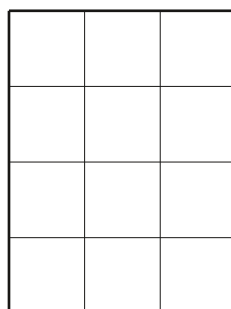
4 ; 1



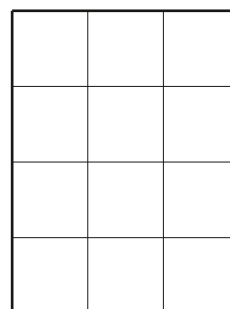
1 ; 1 ; 3



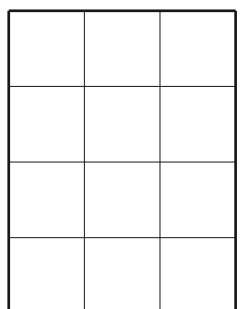
1 ; 2 ; 1



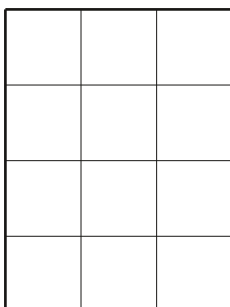
1 ; 4 ; 1



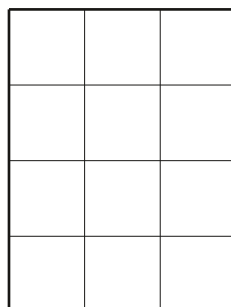
2 ; 1 ; 2



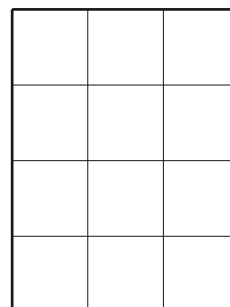
2 ; 3 ; 1



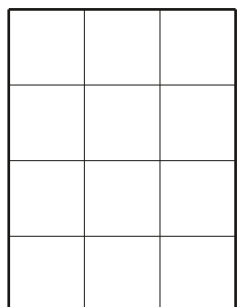
3 ; 3 ; 1



4 ; 2 ; 1

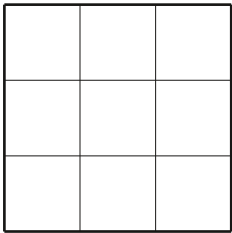


5 ; 2 ; 1

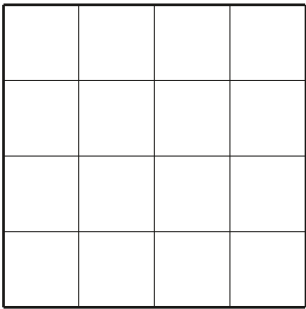


Pour chaque grille, **réaliser un recouvrement** qui respecte l'indication, puis en laisser la trace.

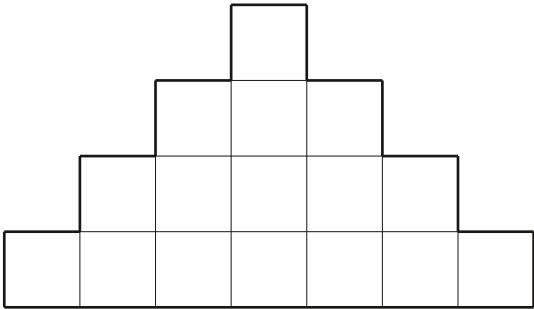
3 ; 3



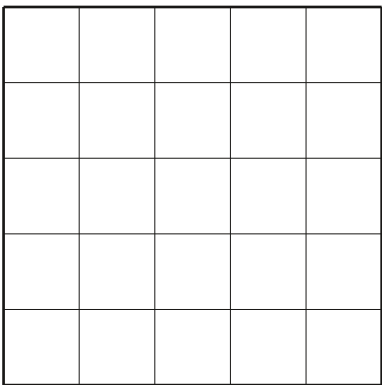
1 ; 3 ; 3



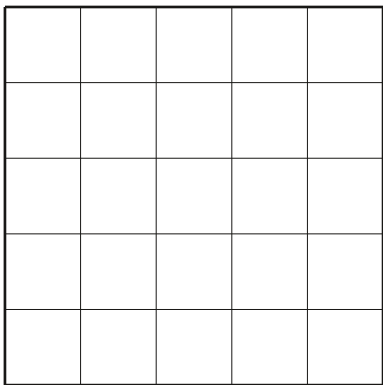
1 ; 3 ; 3



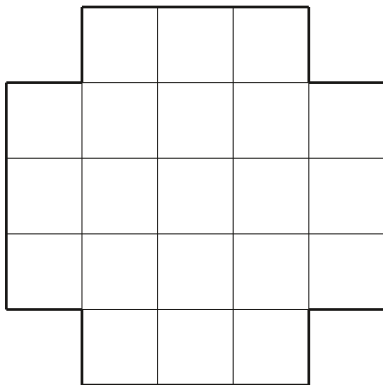
1 ; 2 ; 3



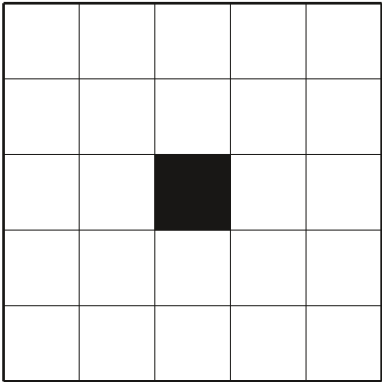
3 ; 4 ; 2



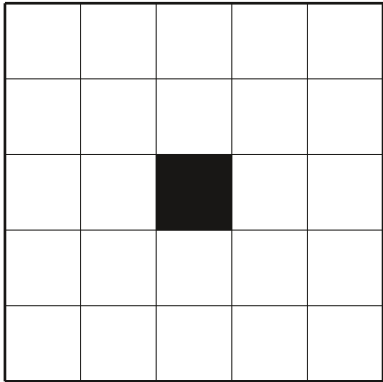
1 ; 1 ; 6



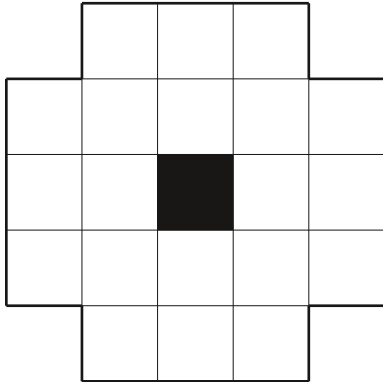
4 ; 4



4 ; 4



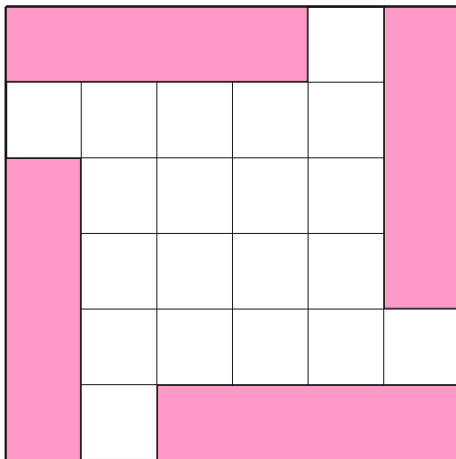
2 ; 2 ; 2



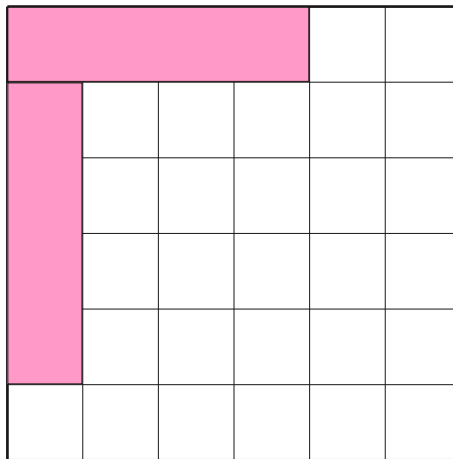
← couleurs différentes →

Pour chaque grille, **réaliser un recouvrement** qui respecte l'indication, puis en laisser la trace.

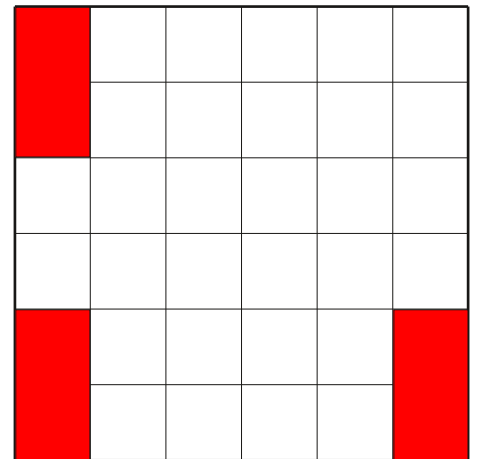
6 ; 6



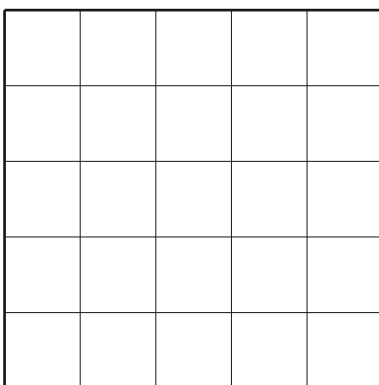
6 ; 2



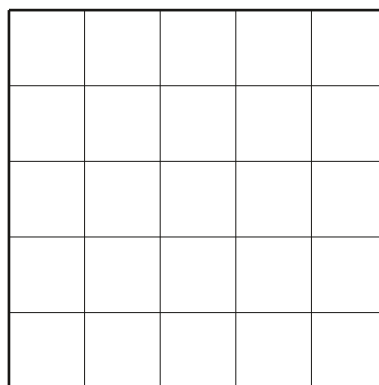
4 ; 7



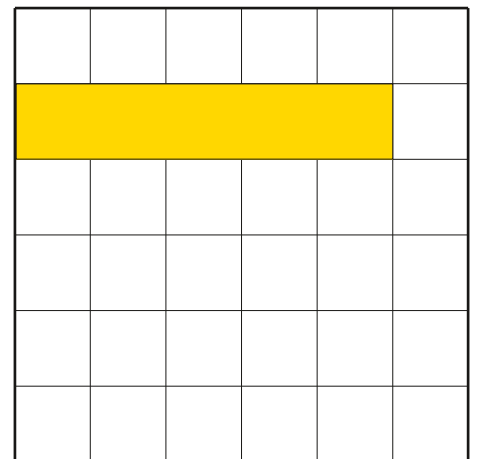
1 ; 4 ; 3



3 ; 4



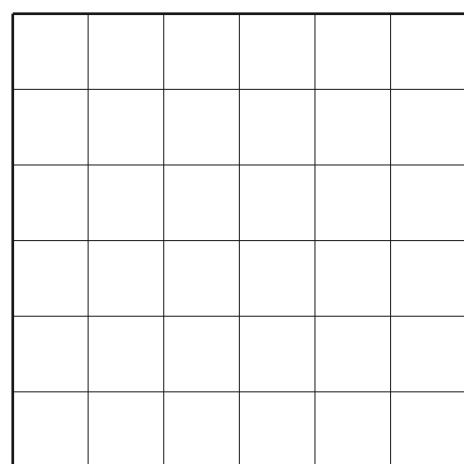
4 ; 4



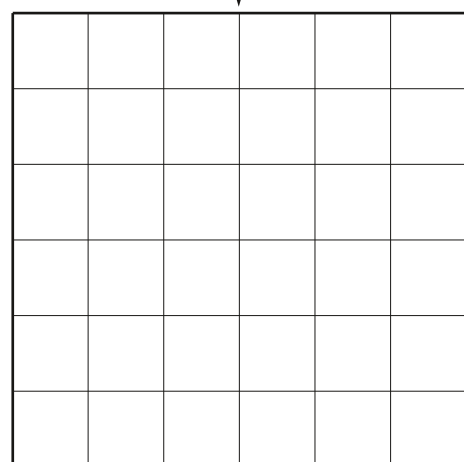
Pour chaque grille, **réaliser un recouvrement** qui respecte l'indication, **puis en laisser la trace.**

COULEURS COMMUNES

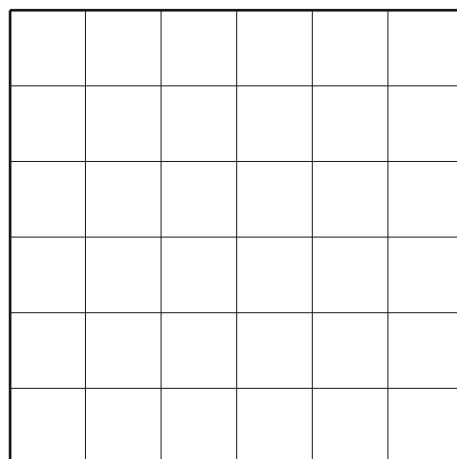
3 ; 3 ; 3
pour chacune
de ces trois grilles



ROSE



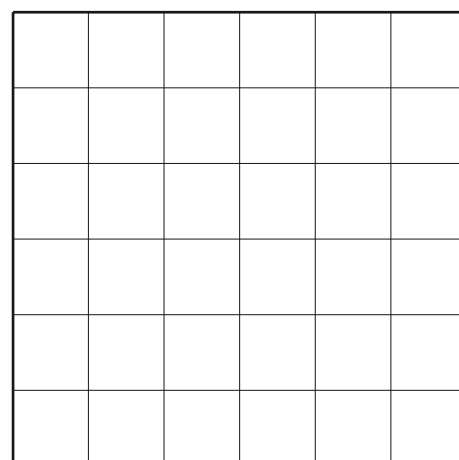
VERT FONCÉ



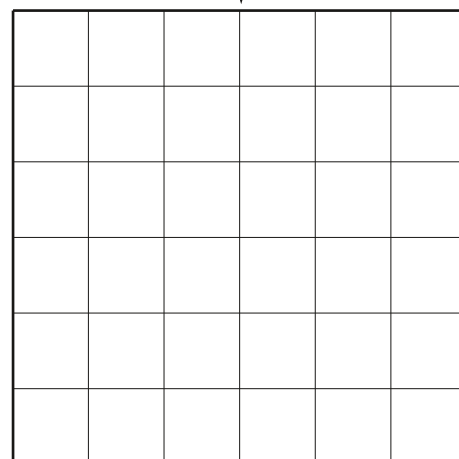
JAUNE



VERT CLAIR



BLANC

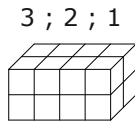


ROUGE



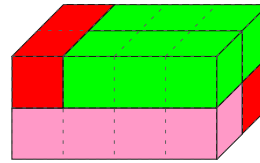
4 ; 4 ; 4
pour chacune
de ces trois grilles

L'indication est celle de la composition d'un pavé.

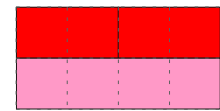


donne

par exemple



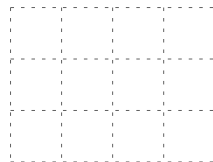
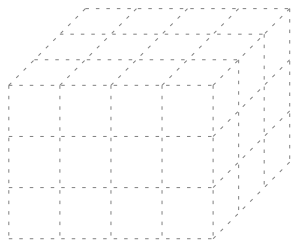
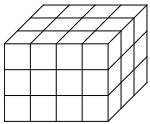
haut



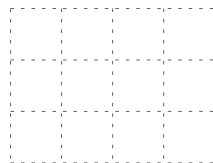
bas

Construire le pavé selon son indication et comme dans l'exemple ci-dessus, **en dessiner la perspective et les vues de dessus par strates.**

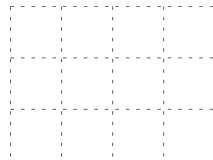
1 ; 6 ; 4



haut

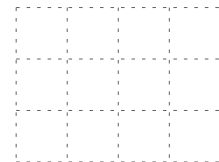
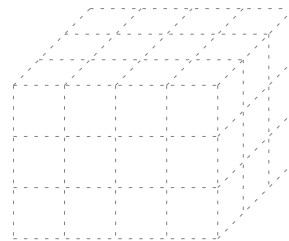
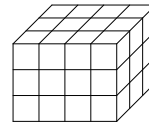


milieu

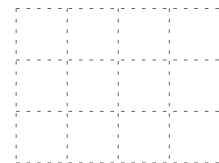


bas

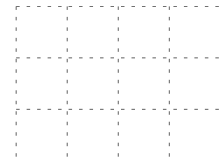
2 ; 4 ; 5



haut

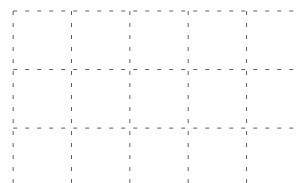
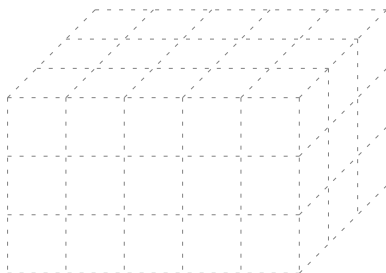
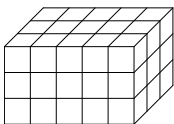


milieu

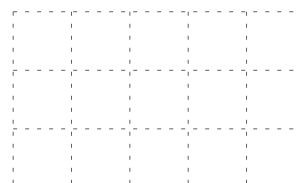


bas

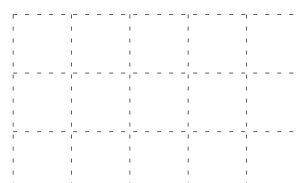
3 ; 1 ; 4 ; 4



haut

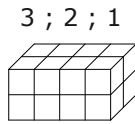


milieu



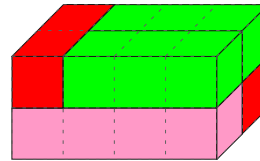
bas

L'indication est celle de la composition d'un pavé.

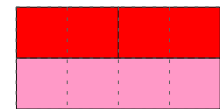


donne

par exemple

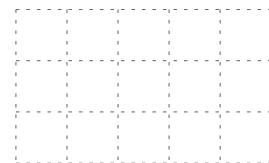
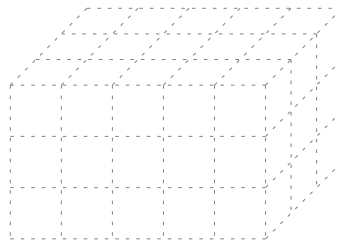
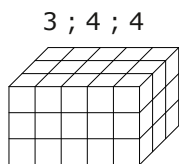


haut

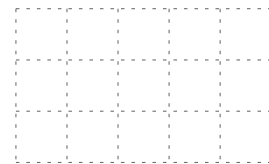


bas

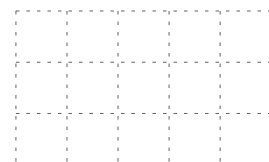
Construire le pavé selon son indication et comme dans l'exemple ci-dessus, **en dessiner la perspective et les vues de dessus par strates.**



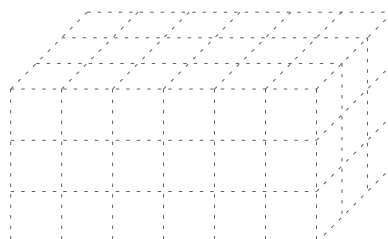
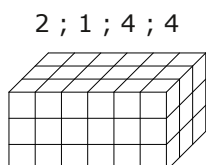
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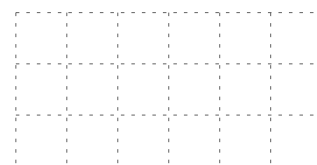
milieu



bas



haut



milieu



bas

Les titres des fiches restent décalés,
à commencer par celui de cette présentation ...

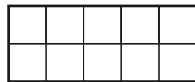
Trapsa inaugure **Rate** en proposant deux grilles aidées ;
Atouille , des grilles rectangulaires de 3 sur 4 ;
les ratios des fiches suivantes amènent tous des possibilités multiples :
Kisdilat, des grilles de 6, 7 ou 9 sur 4 ;
Ification, des grilles carrées de 6 sur 6 ;
Onlaveur demande de plus de disposer les possibilités selon un assemblage
qui couple les couleurs communes.

Des **solutions** sont proposées pages 15 à 23.

L'indication donne **le ratio des réglettes de chaque sorte** qui recouvrent entièrement la grille ; et ceci dans l'ordre **des réglettes les plus petites aux plus grandes**, mais sans les nommer.

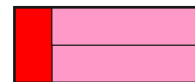
Exemple

pour $1 : 2$

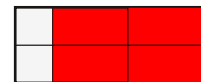


il y a deux possibilités :

$1 : 2$



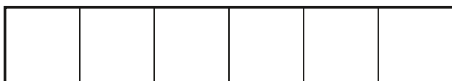
$1 : 2$



On ne tient pas compte de la disposition des réglettes.

Voici deux premières grilles aidées.

$1 : 1$



Le ratio 1 pour 1 signifie que

- il faut utiliser deux sortes de réglettes
- il en faut autant de l'une que de l'autre.

- Si il y en a une de chaque sorte : on cherche $1 \times \dots + 1 \times \dots = 6$.

Deux cas sont possibles, placer une réglette **1** et une réglette **5**, ou placer une réglette **2** et une réglette **4** ; en dessiner les traces ci-dessous.

- Si il y en a deux de chaque sorte : on cherche $2 \times \dots + 2 \times \dots = 6$,
ou $1 \times \dots + 1 \times \dots = 3$.

Une seule possibilité, placer deux réglettes **1** et deux réglettes **2** ; en dessiner les traces ci-dessous.

- Il ne peut pas y en avoir trois de chaque sorte.

$1 : 1$



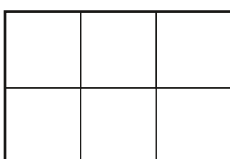
$1 : 1$



$1 : 1$



$1 : 1$

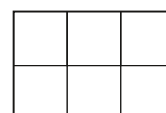


Même ratio.

- Pour une réglette de chaque sorte, il faut $1 \times \dots + 1 \times \dots = 6$; mais ici la plus grande réglette possible est 3. Pas de solution.
- Pour deux réglettes de chaque sorte, il y a une solution.

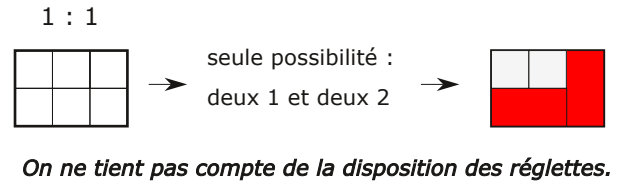
Placer les réglettes.

Dessiner la trace ci-contre.



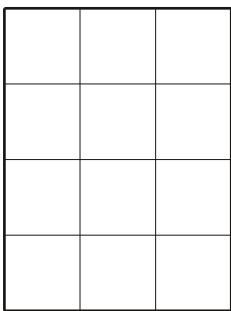
$1 : 1$

L'indication donne le **ratio des réglettes de chaque sorte** qui recouvrent entièrement la grille ; et ceci dans l'ordre **des** réglettes les **plus petites aux plus grandes**, mais sans les nommer.

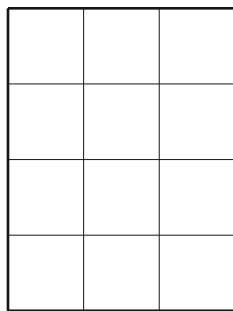


Pour chaque grille, **réaliser un recouvrement** qui respecte l'indication, **puis en laisser la trace**.

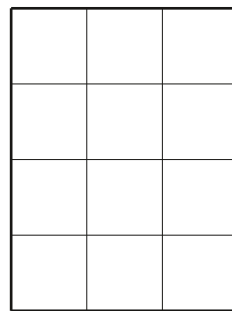
1 : 1



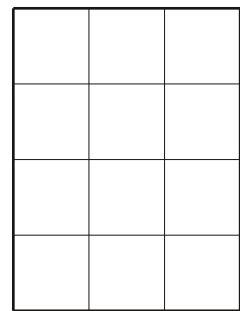
1 : 1



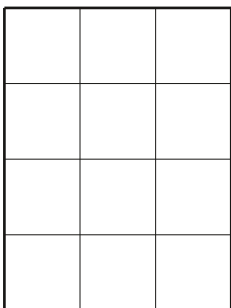
1 : 1



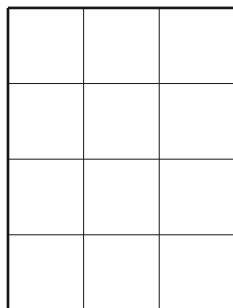
2 : 1



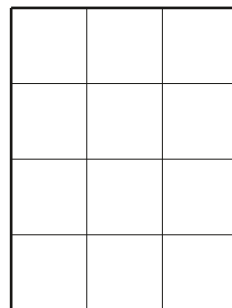
4 : 1



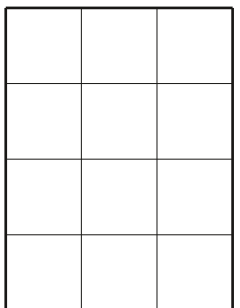
4 : 1



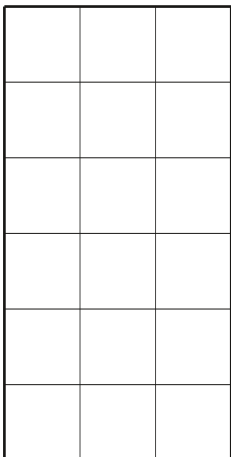
3 : 2



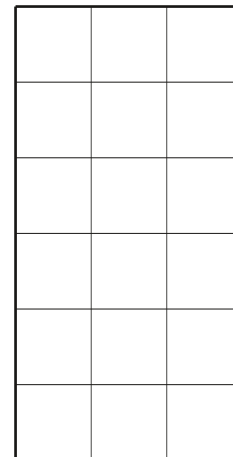
1 : 1 : 1



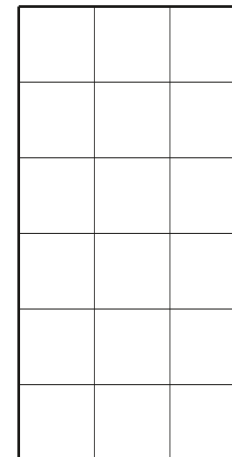
1 : 1 : 1



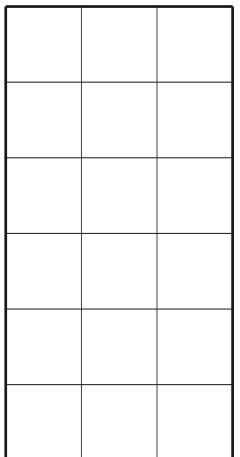
1 : 1 : 1

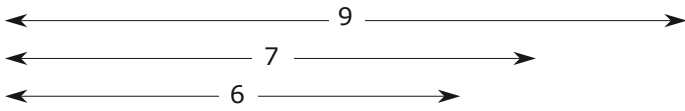


1 : 1 : 1



1 : 1 : 1





Utiliser la grille ci-contre, sur 6 de long ou 7 ou 9 selon les demandes, pour la recouvrir **selon les ratios** indiqués, puis **dessiner les résultats** à leur place ci-dessous.

Pour chaque ratio, la grille est dessinée **autant de fois qu'il y a de possibilités**.

1 : 1 : 1

1 : 1 : 1

1 : 1 : 1

1 : 1 : 1

1 : 1 : 1

1 : 1 : 1

1 : 2 : 1

1 : 2 : 1

1 : 2 : 1

1 : 2 : 1

1 : 2 : 1

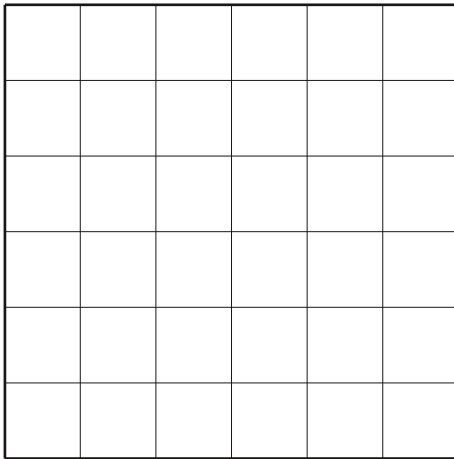
1 : 2 : 1

1 : 1 : 2

1 : 1 : 2

1 : 1 : 2

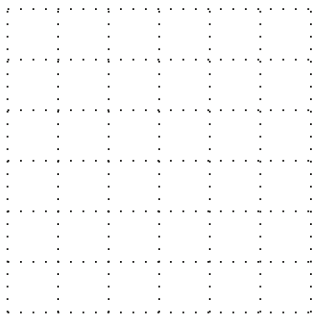
1 : 1 : 2



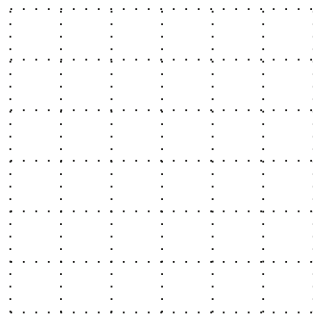
Recouvrir la grille 6x6 ci-contre, selon les ratios indiqués, puis **dessiner les résultats** à leur place ci-dessous.

Pour chaque ratio, la grille est dessinée **autant de fois qu'il y a de possibilités**.

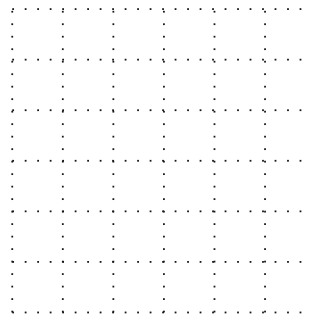
2 : 3



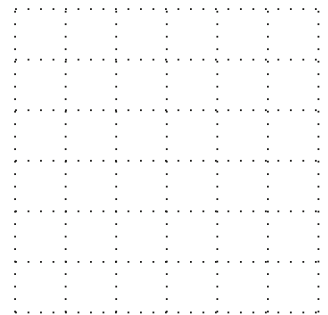
1 : 2 : 2



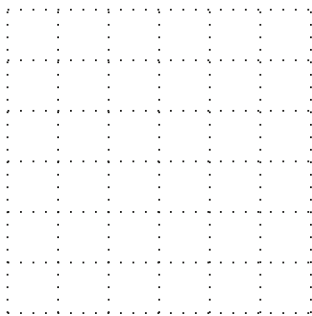
1 : 4



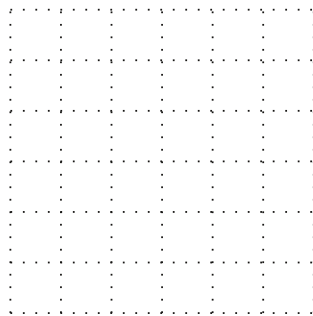
1 : 4



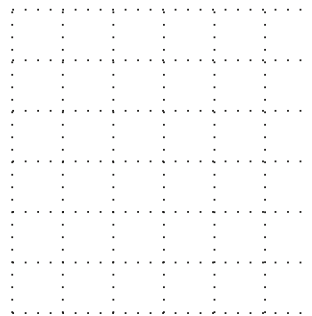
4 : 1



4 : 1



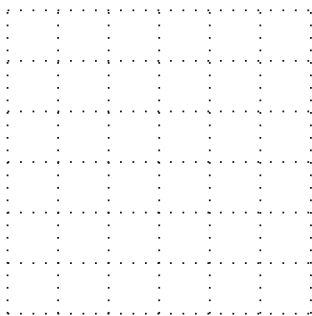
4 : 1



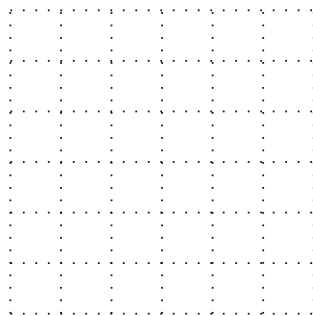
4 : 1



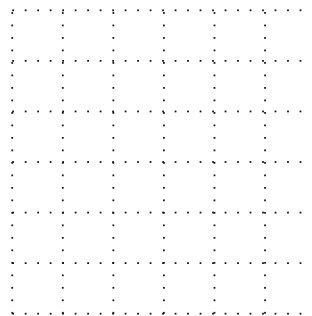
1 : 1 : 2



1 : 1 : 2

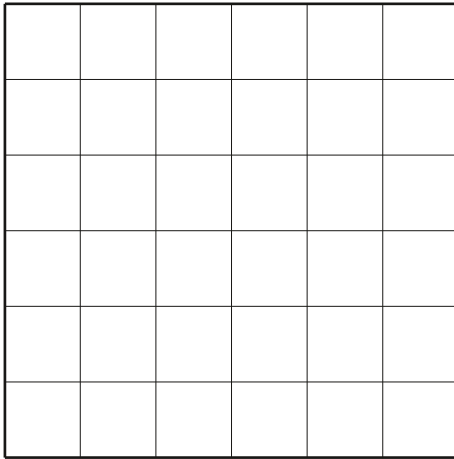


1 : 1 : 2



1 : 1 : 2

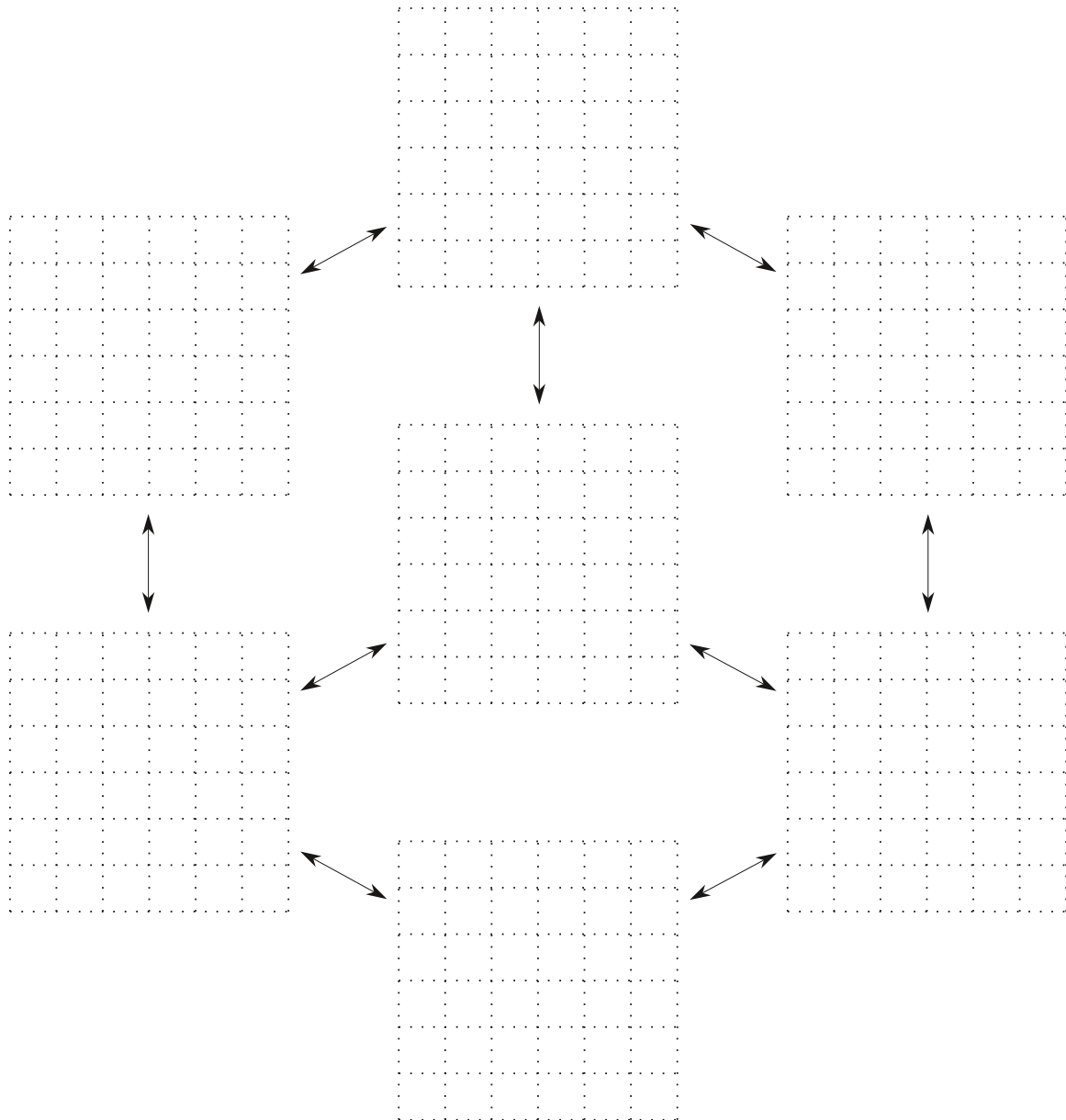




Il existe **sept possibilités** de recouvrir cette grille 6x6 selon le **ratio 1 : 1 : 1**. **Les trouver.**

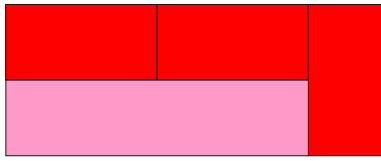
Dans l'**agencement** ci-dessous des recouvrements correspondants, les grilles reliées par **une flèche** ont **deux couleurs communes**.

Dessiner ces recouvrements **aux bons endroits**.

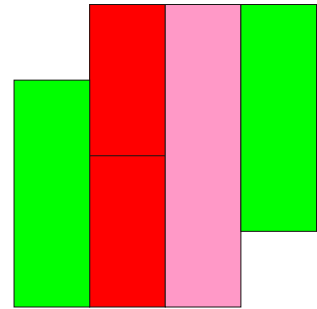


Cardi Kotomi

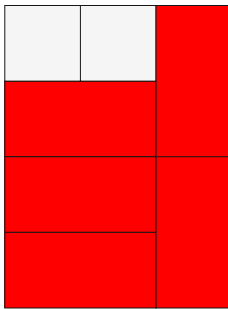
3 ; 1



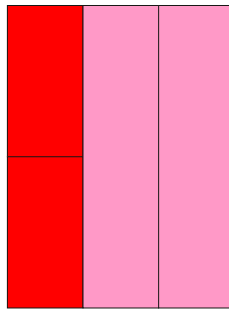
2 ; 2 ; 1



2 ; 5



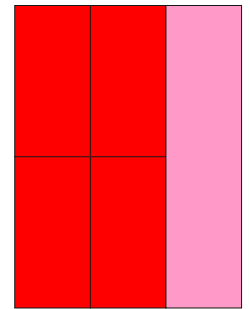
2 ; 2



3 ; 2

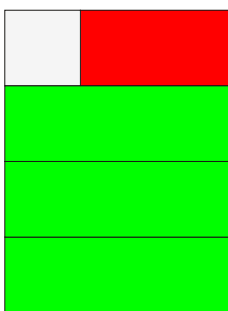


4 ; 1

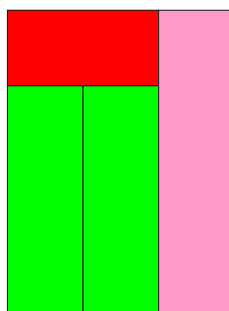


Cardi Kerkredi

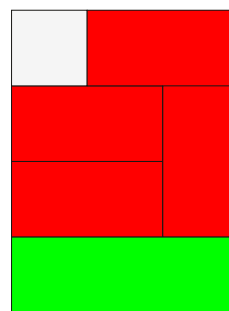
1 ; 1 ; 3



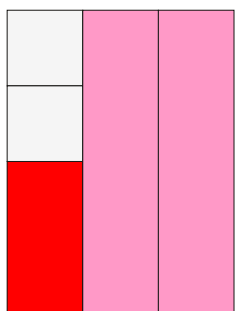
1 ; 2 ; 1



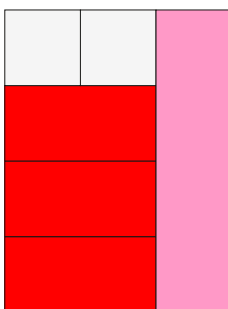
1 ; 4 ; 1



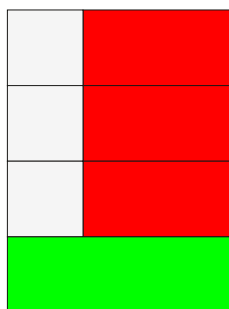
2 ; 1 ; 2



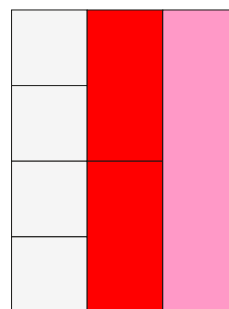
2 ; 3 ; 1



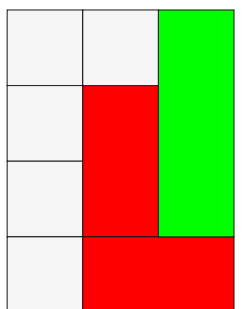
3 ; 3 ; 1



4 ; 2 ; 1



5 ; 2 ; 1

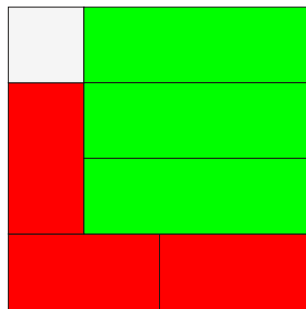


Cardi Keudi

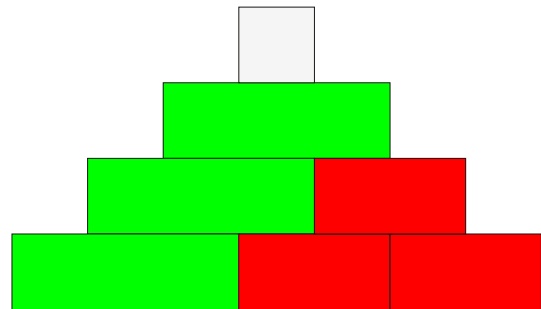
3 ; 3



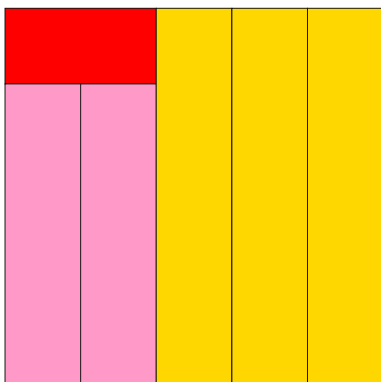
1 ; 3 ; 3



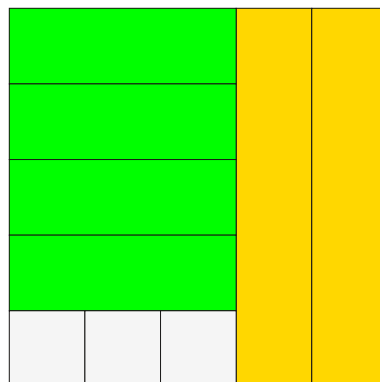
1 ; 3 ; 3



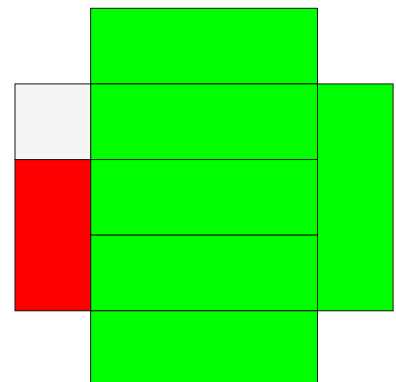
1 ; 2 ; 3



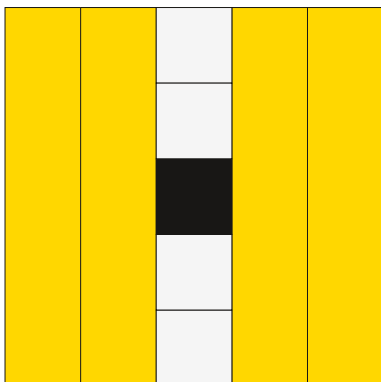
3 ; 4 ; 2



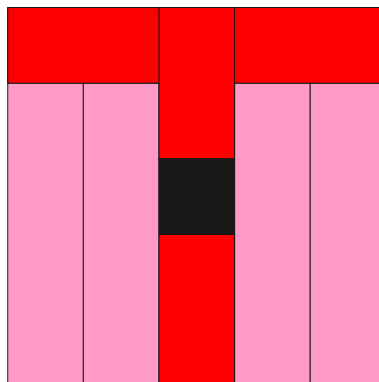
1 ; 1 ; 6



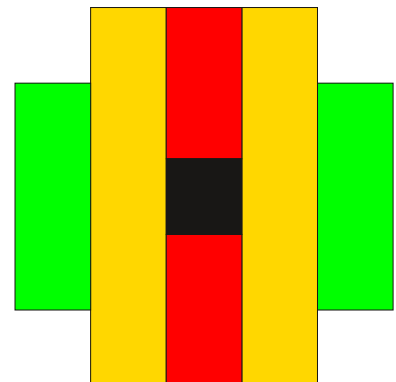
4 ; 4



4 ; 4



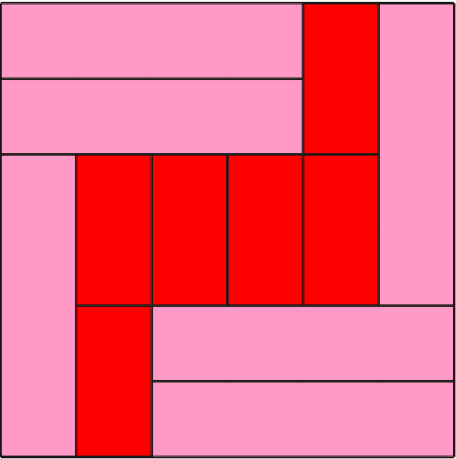
2 ; 2 ; 2



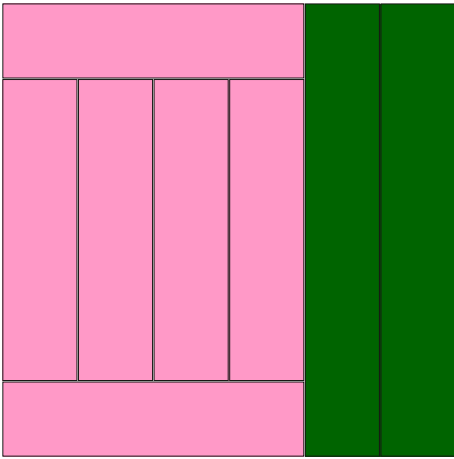
← couleurs différentes →

Cardi Kékidi

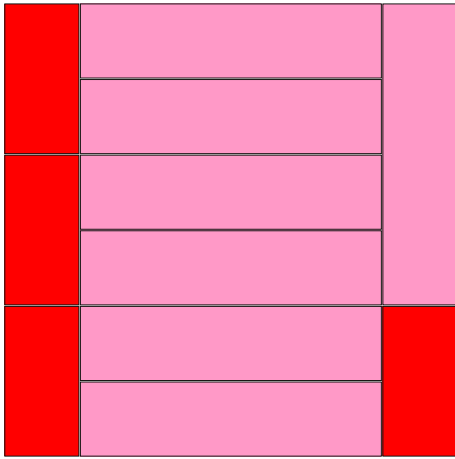
6 ; 6



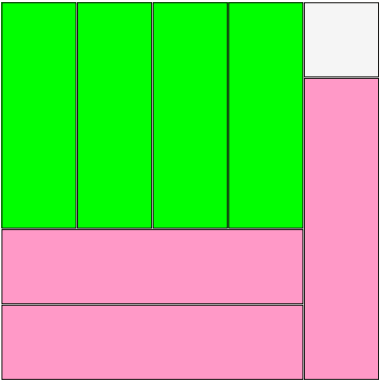
6 ; 2



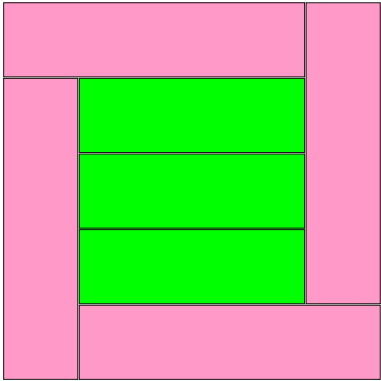
4 ; 7



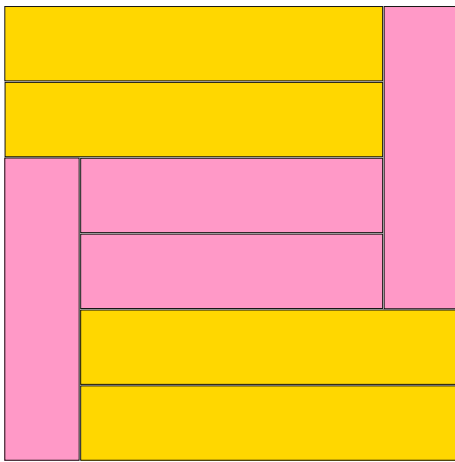
1 ; 4 ; 3



3 ; 4

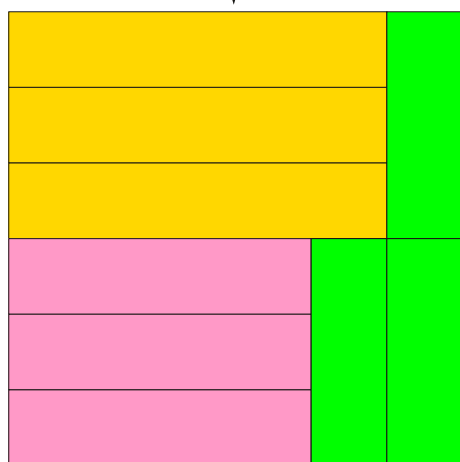


4 ; 4

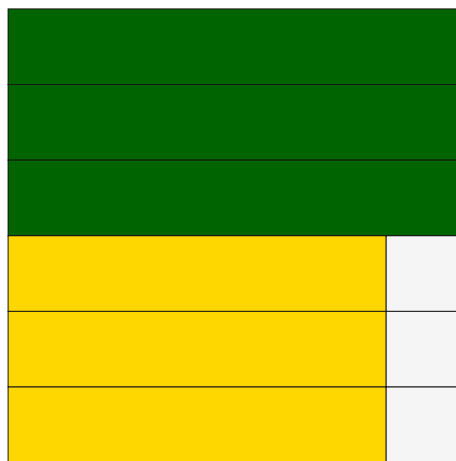




ROSE



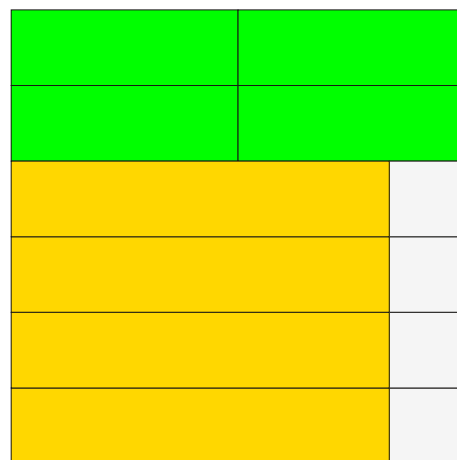
VERT FONCÉ



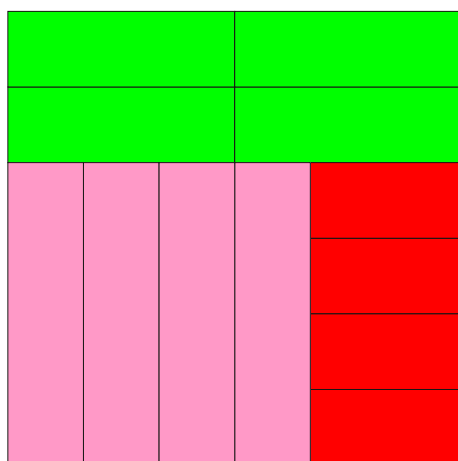
3 ; 3 ; 3
pour chacune
de ces trois grilles

JAUNE

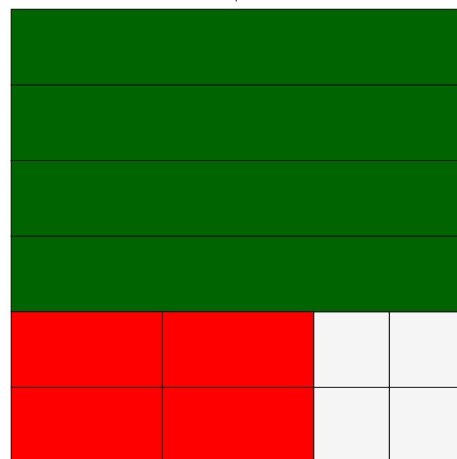
VERT CLAIR



BLANC

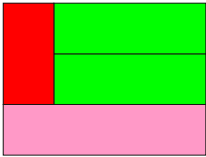
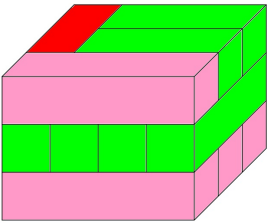


ROUGE

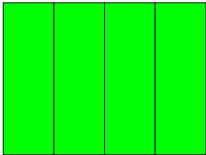


4 ; 4 ; 4
pour chacune
de ces trois grilles

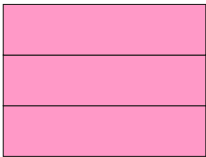
1 ; 6 ; 4



haut

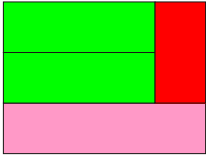
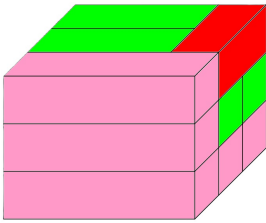


milieu



bas

2 ; 4 ; 5



haut

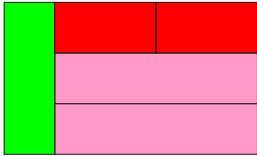
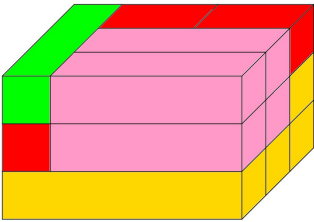


milieu



bas

3 ; 1 ; 4 ; 4



haut

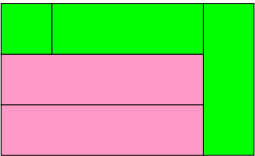
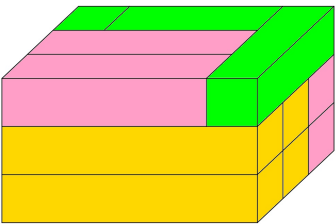


milieu

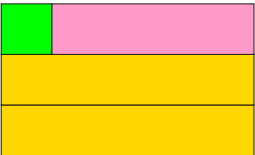


bas

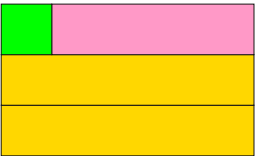
3 ; 4 ; 4



haut

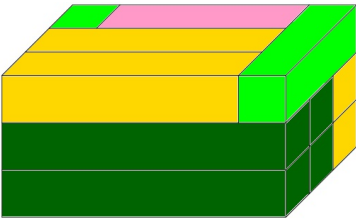


milieu



bas

2 ; 1 ; 4 ; 4



haut



milieu



bas

Rate Trapsa

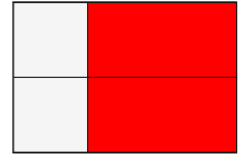
1 : 1



1 : 1



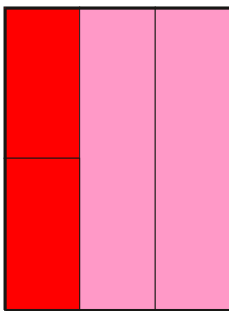
1 : 1



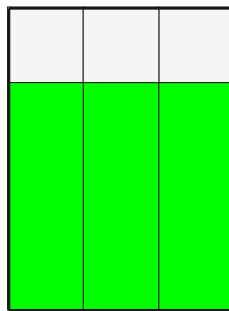
1 : 1



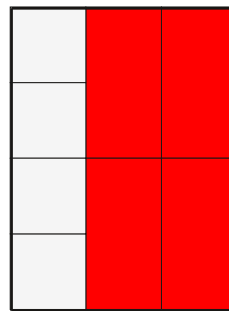
1 : 1



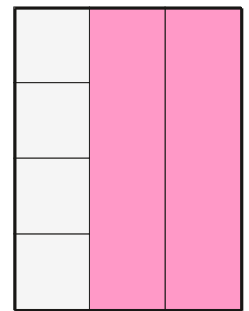
1 : 1



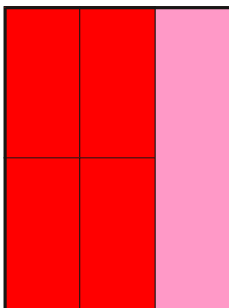
1 : 1



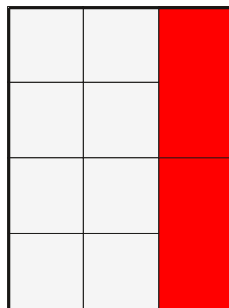
2 : 1



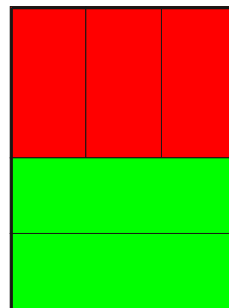
4 : 1



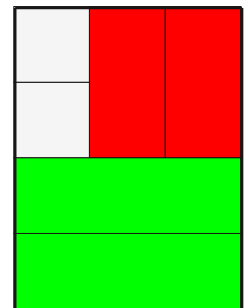
4 : 1



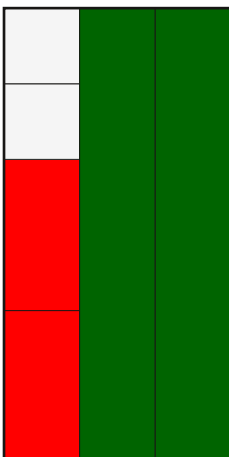
3 : 2



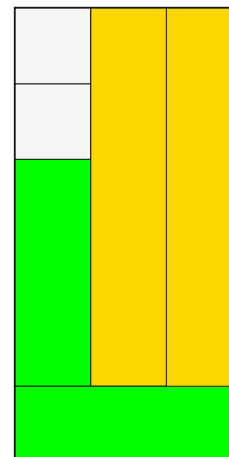
1 : 1 : 1



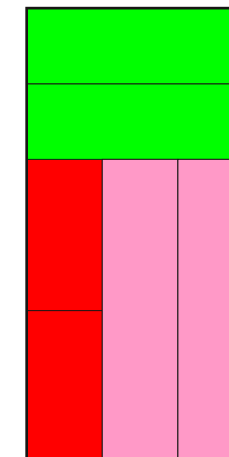
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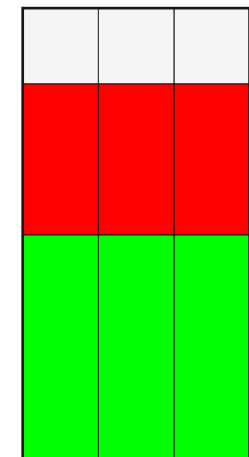
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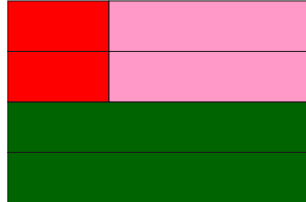
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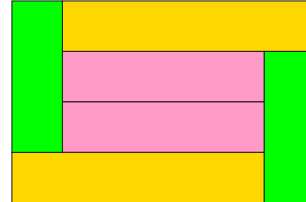
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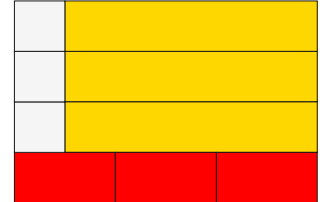
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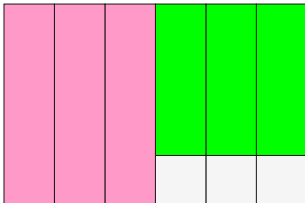
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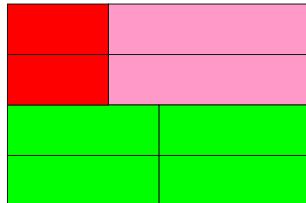
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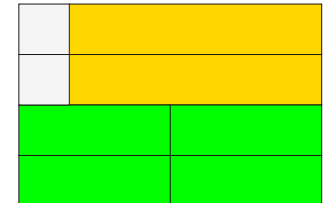
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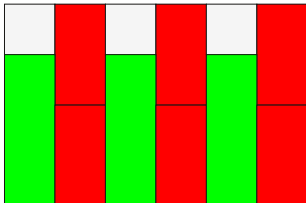
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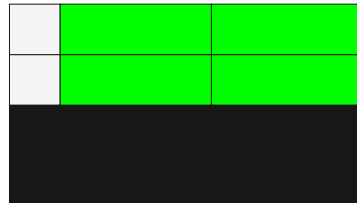
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1 : 2 : 1



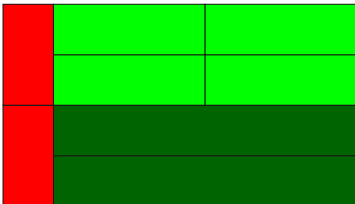
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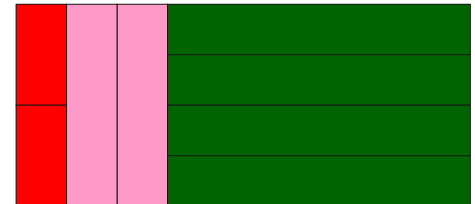
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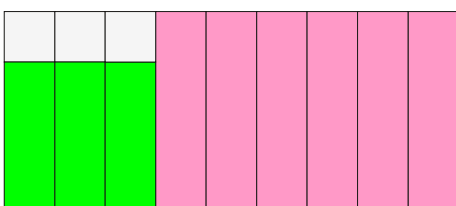
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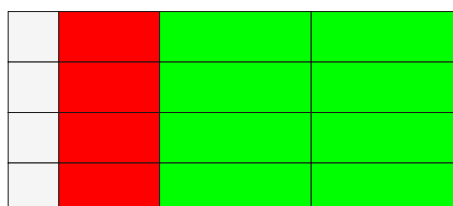
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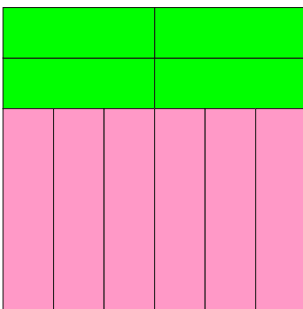


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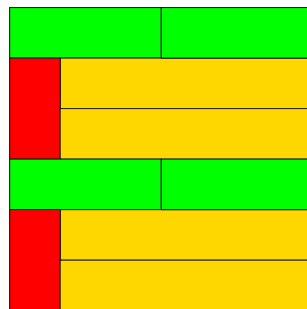


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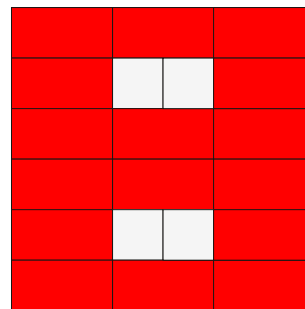
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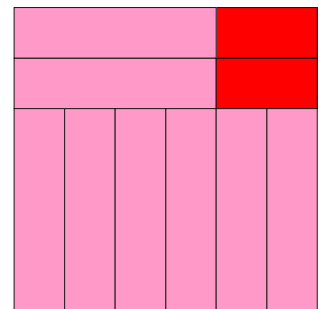
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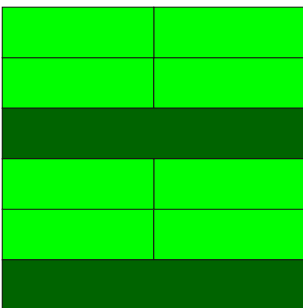
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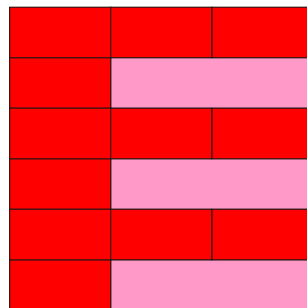
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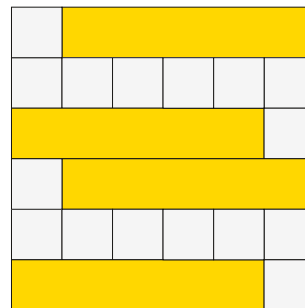
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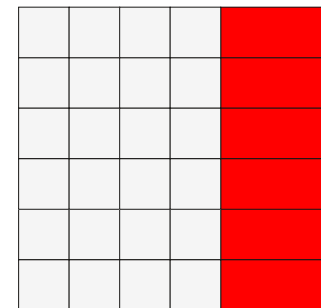
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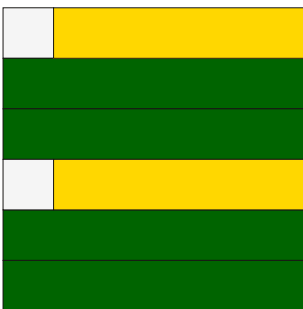
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4 : 1



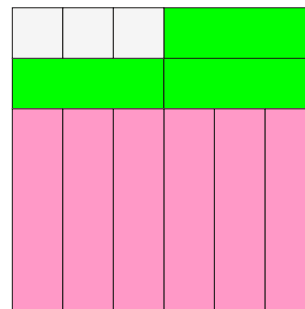
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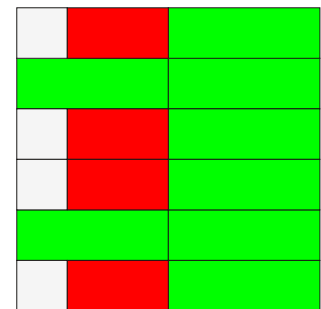
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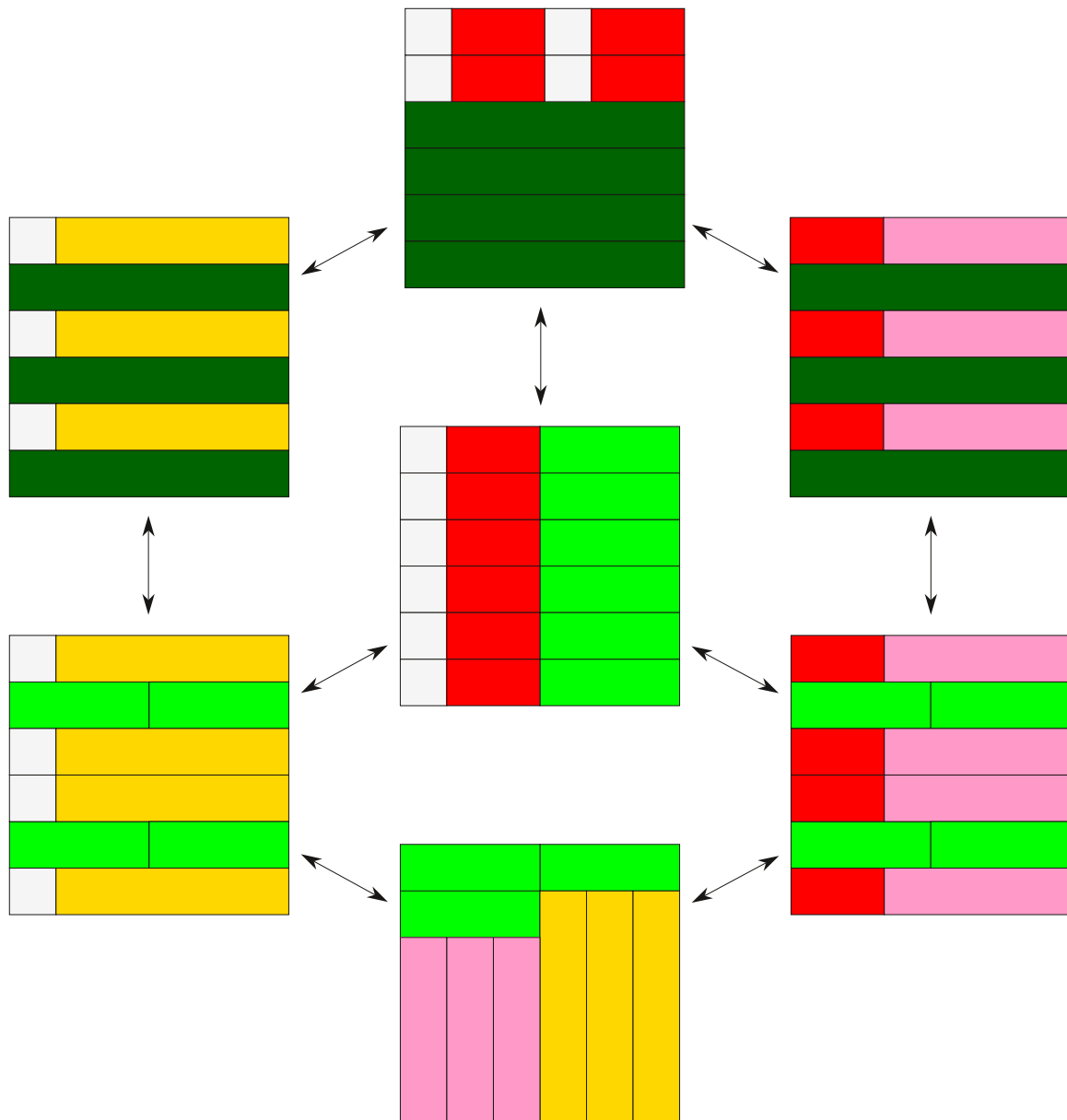
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1 : 1 : 2



Rate Onlaveur



Le fichier RatonLaveur.ggb propose de retrouver les autres dispositions possibles.