

Basic turns

right = $\uparrow\downarrow$ front = $\rightarrow\leftarrow$ back = $\leftarrow\cdots\cdots\rightarrow$ middle = $\uparrow\downarrow$ top = 90 180

We introduce five “turn vectors” as:

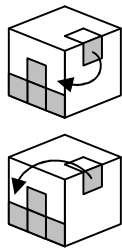
$M = (\uparrow, \downarrow)$ $360 = (90, 180, 90)$ $540 = (90, 90, 180, 180)$

$R = (\uparrow, \downarrow, \uparrow, \downarrow)$ $BF = (\leftarrow, \rightarrow, \cdots, \leftarrow)$

And x will denote the alternative application of these vectors! For example:

$360 x (\uparrow, \downarrow) = 90 \uparrow 180 \downarrow 90 = T$ which will be our basic “triangle” trick.

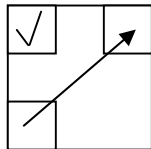
Middle edges



$\rightarrow T \leftarrow$
 $\leftarrow T \rightarrow$

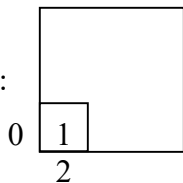
Top corners

Placing:



= $R x BF$

Whitening:

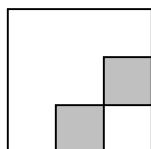


= $R x 540$

0, 1, 2 indicate where a white color must face if that many corners face white up.

Top edges

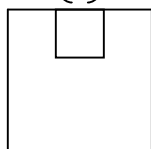
Whitening:



$\downarrow T \uparrow$



Placing:



$\text{—} T \text{—}$

The tick means that if possible an edge must be in its place there.