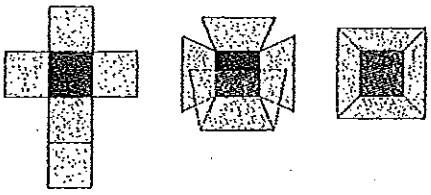
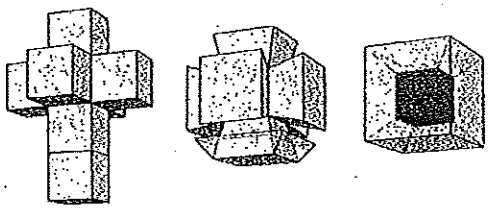


Hypercubes.

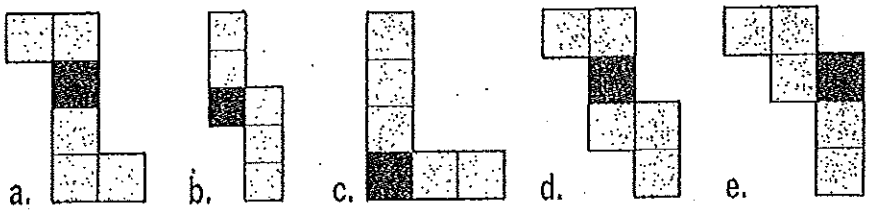
A number of 20th-century artists portrayed higher dimensional spaces in their paintings. In Salvador Dali's Corpus Hypercubicus (1954)[1] the traditional cross made of six squares, which can be folded into a cube as shown above, is replaced by a higher-dimensional cross made of eight cubes, which can be folded into a hypercube as shown below.



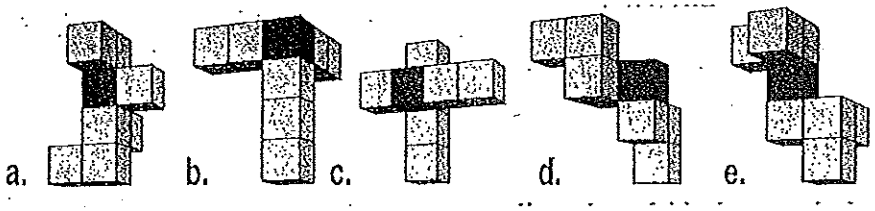
The cubical "faces" of the hypercube do not fold along hinged edges, as they would in three-space. Instead, they stay joined along entire square faces. To us three-spacers, some of the cubes appear squashed, distorted, or even turned inside out. See "Folding cubes and hypercubes"[2]

Problems (from Scott Kim)

1. Which two of the strips below cannot be folded into a cube? Hint: Hold the dark square still and fold the others around it.



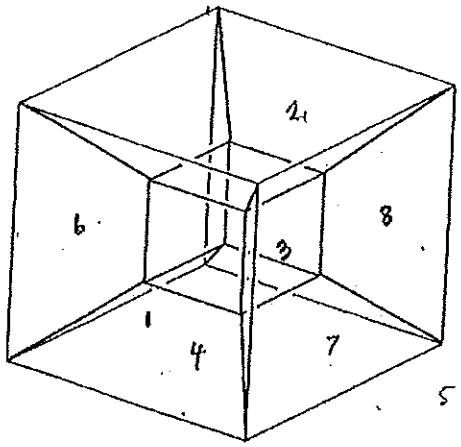
2. Find all eleven ways to unfold a cube.
3. There are 261 ways to unfold a hypercube. Which of these shapes cannot be folded into a hypercube? Hint: Hold the dark cubes still and fold the others in front.

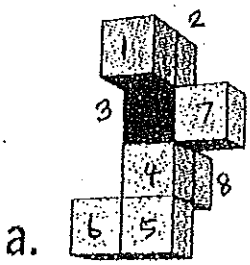


[1] http://129.175.94.92/Lebrun/painting/dali/corpus.htmHypercubus

[2] http://www.math.union.edu/~dpvc/courses/2001-02/MTH053-WI02/notes/folding/welcome.html

1. front
2. top
3. inside
4. bottom
5. outside
6. left
7. right
8. back





a.

1.
2.
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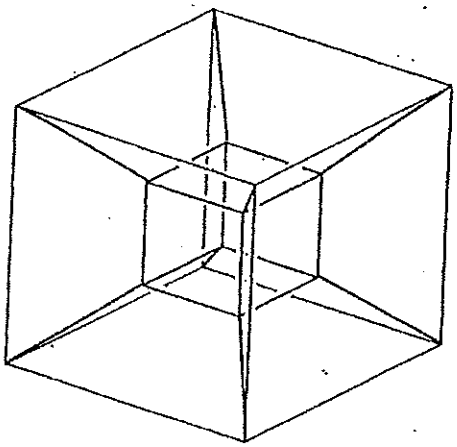

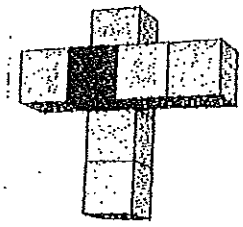

1.
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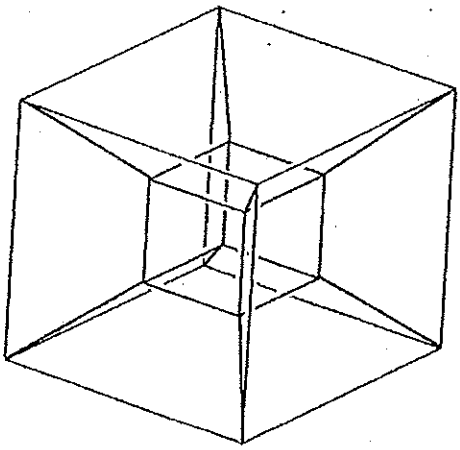

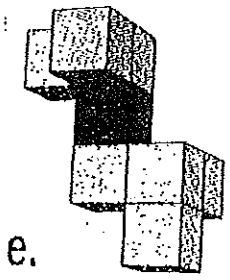
e.