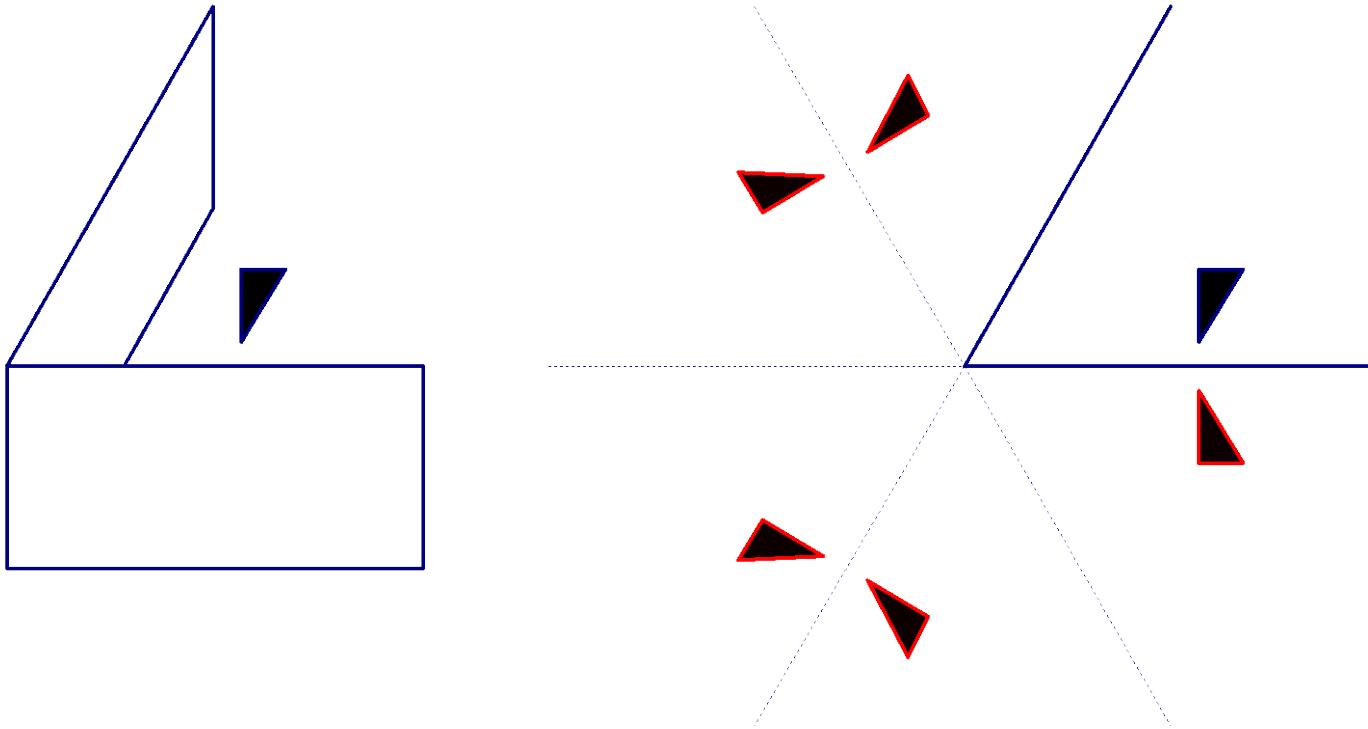


The Many Facets of Symmetry

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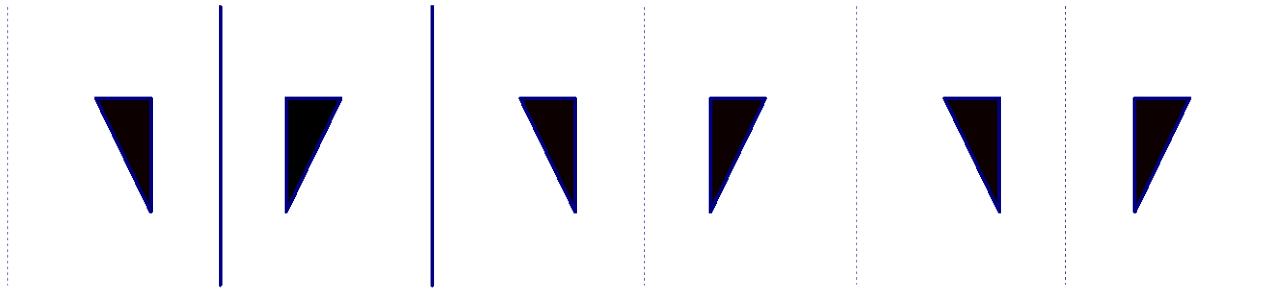
Mirrors

- Two 6 inch by 12 mirrors at an angle of $180/n$ embody the dihedral group D_n .

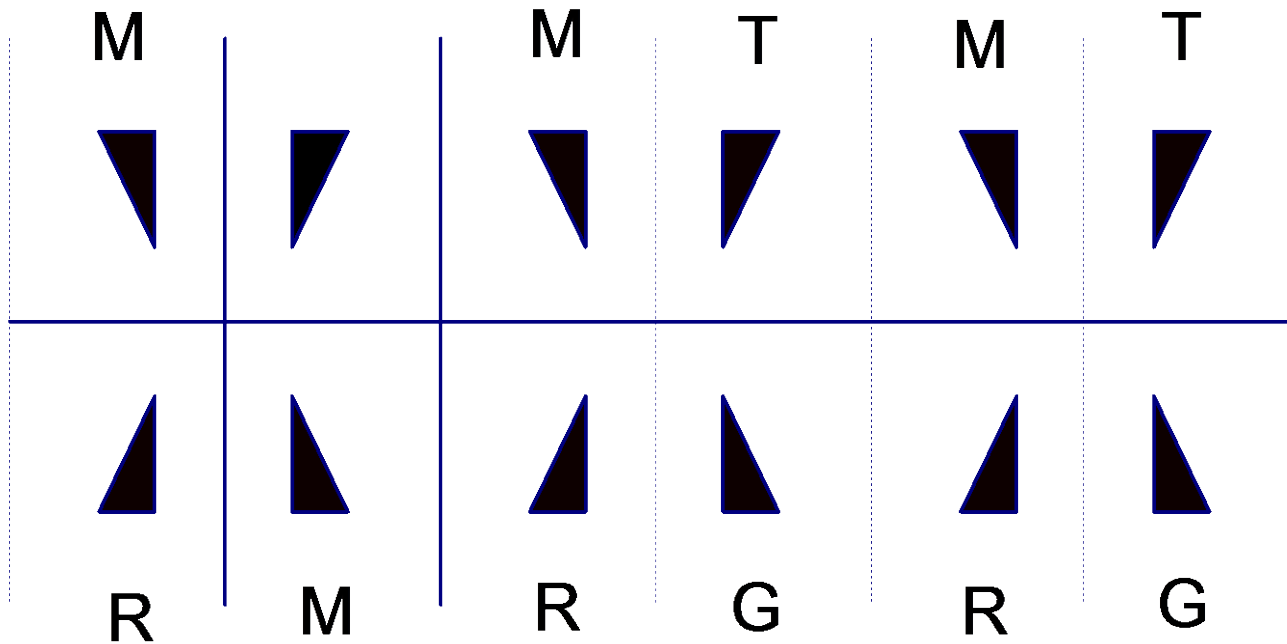


Mirrors (Cont.)

- Parallel mirrors give infinite dihedral group.



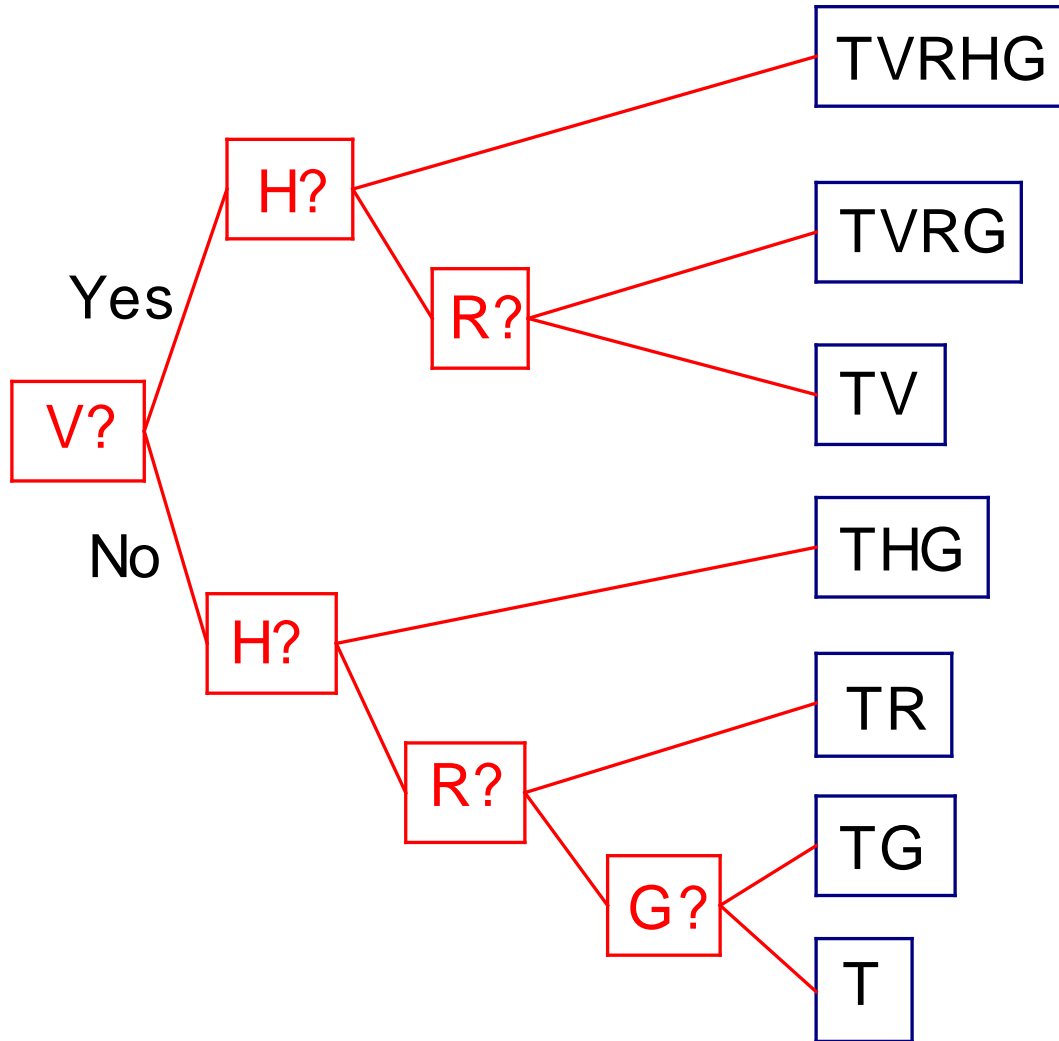
- Three mirrors can give glide reflections.



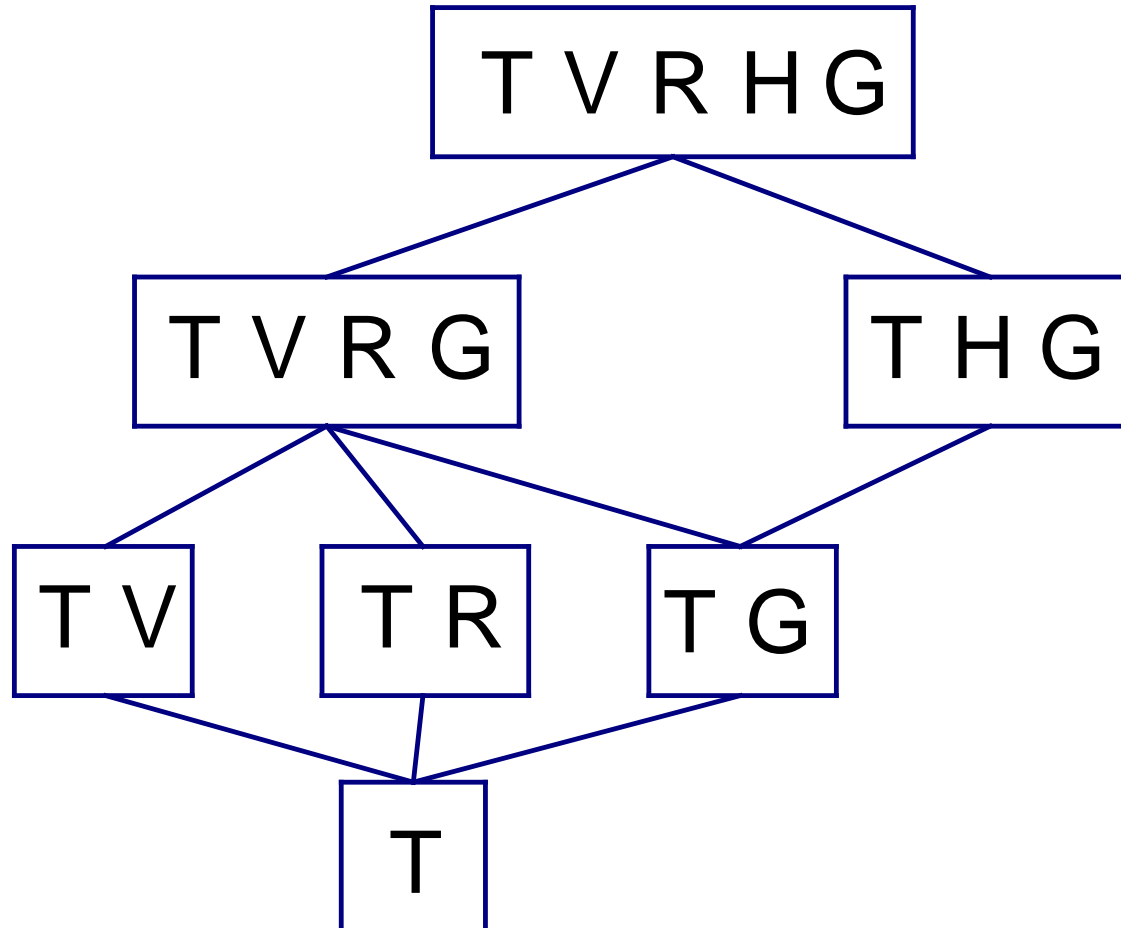
Frieze Patterns

- Have students find all the different types of frieze patterns given examples of 2 of them.
- Ex. T T T T
- Ex. L L L L

Flow Charts



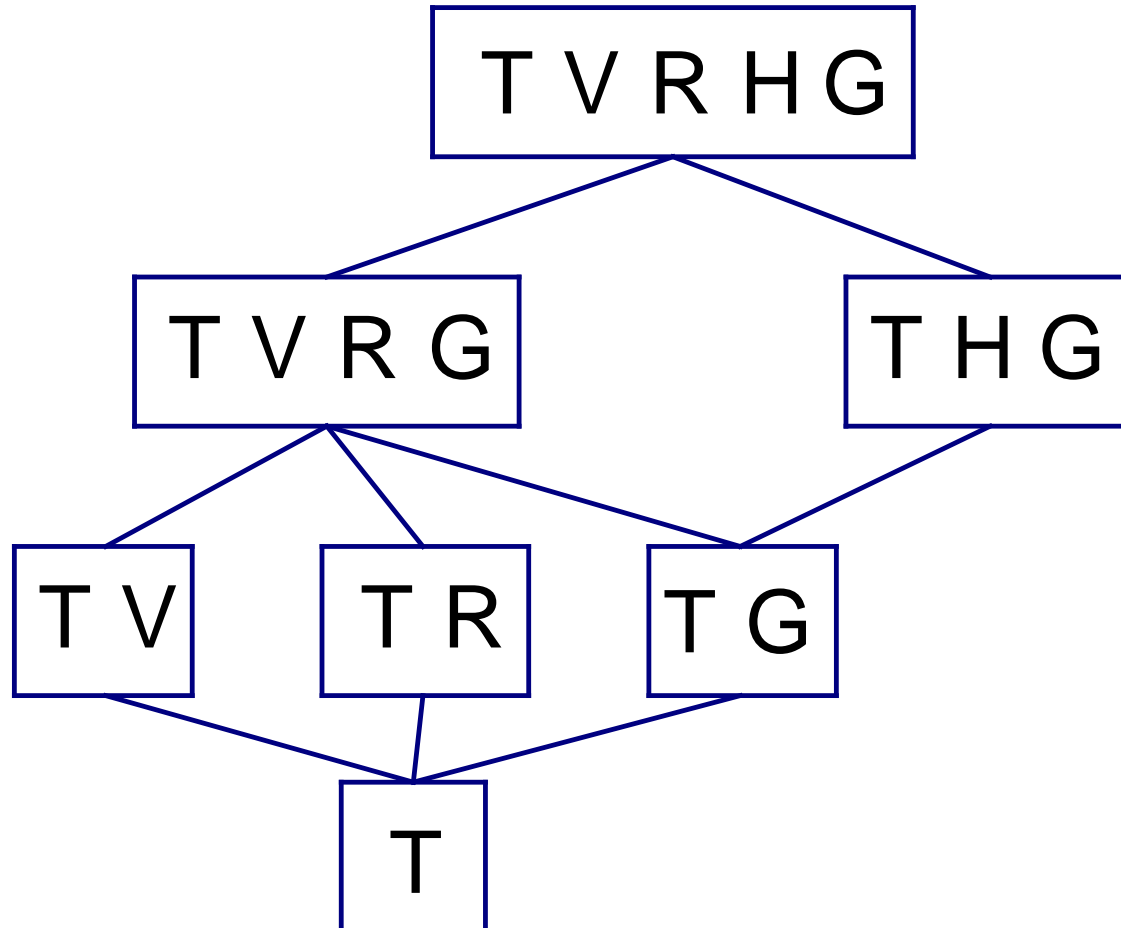
Subgroup Lattice



Two Color Frieze Patterns

- Ex. Λ V Λ V Λ V Λ V has only vertical mirrors and translations preserving colors. But 180 rotations and glide reflections can switch colors. $pmg2/pm11$ or $TVRG/TV$

Subgroup Lattice

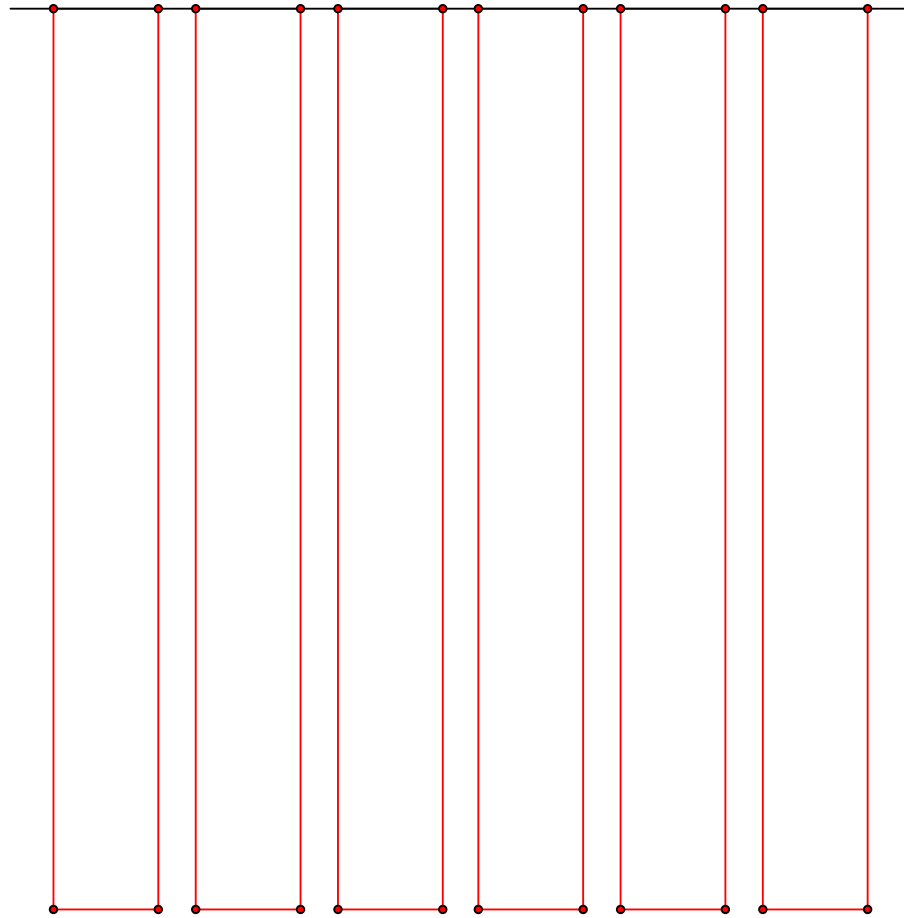


- Color preserving group must be subgroup of entire group (switching and preserving).
- Students can list all 22 possible pairs and hunt for the 17 possible ones.

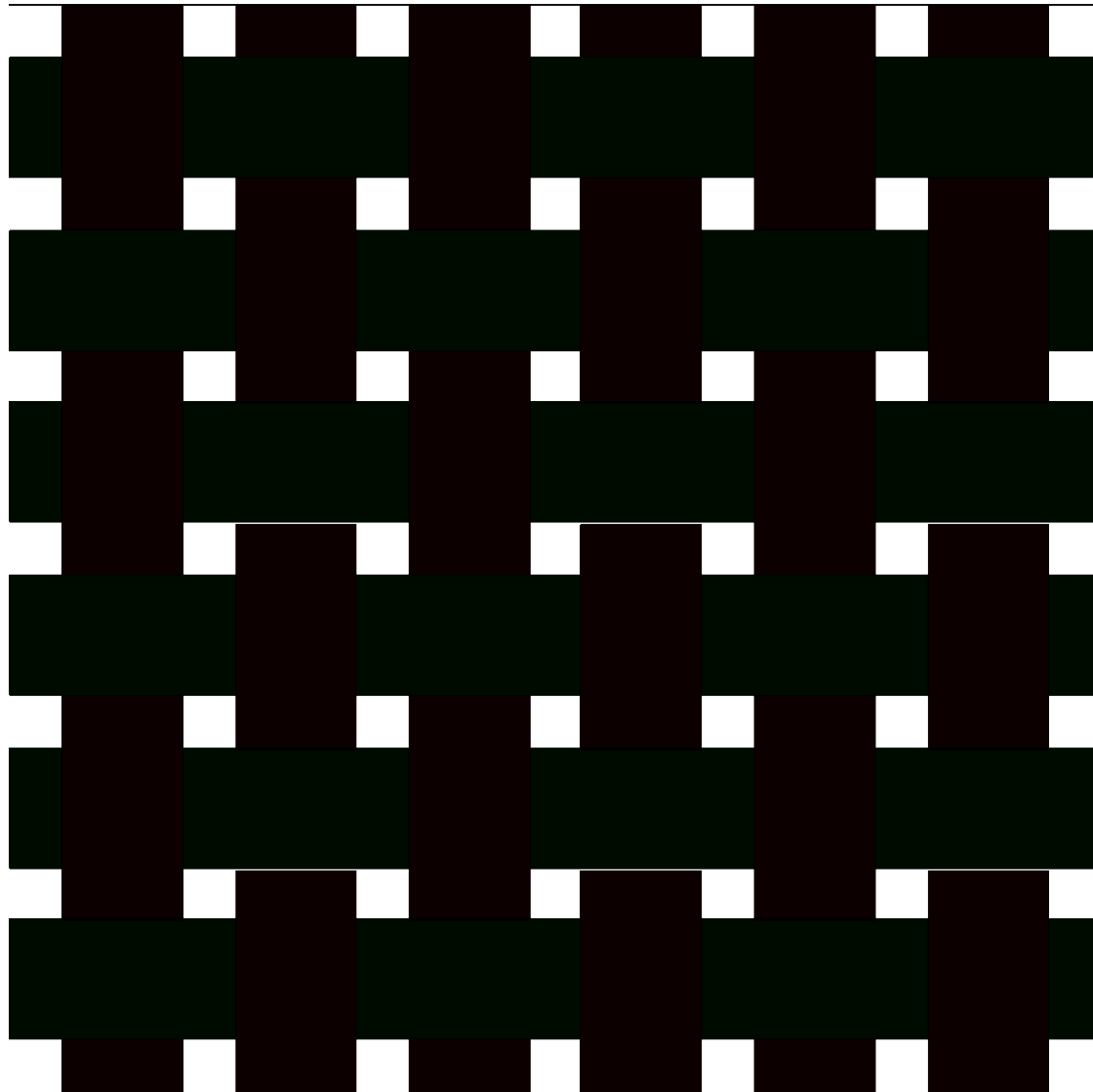
Wallpaper Patterns

- Mirrors for kaleidoscopes
- flowcharts, two-color.
- Brick patterns (built from 2×1 rectangles)

Weaving Patterns



Weaving Patterns (II)



Polyhedra

- Counting and analyzing symmetries



Symmetry Tour



Symmetry Tour



Symmetry Tour



Symmetry Tour



Symmetry Tour

