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GEOL.3090L - EARTH MATERIALS I
 SYMMETRY AND MILLER INDICES EXERCISE

In this exercise you will determine the point symmetry for twelve basic shapes provided by the instructor and the Miller Indices for the faces shown on these shapes.

Identify the symmetry operations - reflection, rotation, inversion, rotoinversion, that apply to each shape and the number of each type of symmetry operations. Enter the symmetry content in the table below using the proper notation for each operation (see p. 89 and p. 92, Table 5.1, in Klein and Philpotts 2017 for proper format).

In the table below, for each shape enter the Miller Index for the faces shown on the block. Remember that the Miller Index is referenced to a unit cell (p. 96 - 99, Klein and Philpotts 2017). The Miller Index is the reciprocal of the intercepts of the plane with the axes of the unit cell and the clearing of fractions (if necessary). For example, a plane cuts a unit cell at $a = 0$, $b = 1$, and $c = 1$. The Miller Index for this plane is 011. A second example involving fractions, a plane cuts a unit cell at $a = 1/2$, $b = 1$, and $c = 1/2$. The Miller Index for this plane is 212. As a third example, a plane cuts a unit cell at $a = 1$, $b = 2$, $c = 1$. The Miller index for this plane is 212.

Table for Symmetry and Miller Indices Exercise

Block #	Symmetry Content	Crystal System	Miller Indices
1			
2			
3			
4			

Block #	Symmetry Content	Crystal System	Miller Indices
5			
6			
7			
8			
9			
10			
11			
12			