

## 4.2: Representations and Character Tables

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Learning objectives for this unit are to:

- Perform matrix multiplication
  - Recognize square, diagonal, and identity matrices
  - Construct transformation matrices for symmetry operations
  - Understand and extract information from character tables, including the order of the group, the number of classes of symmetry operations, and the meaning of the characters
  - Explain the difference between reducible and irreducible representations
  - Generate representations using a variety of basis sets, including xyz coordinate vectors, rotational vectors, and atomic orbitals
  - Perform calculations to demonstrate that two irreducible representations are orthogonal
  - Know the information indicated by the Mulliken symbols and be able to assign Mulliken symbols to irreducible representations
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