Cubes: Slicings, Projections, and Foldouts II

Counting:

1. How many vertices, edges, and squares does a cube have?

2. How many vertices, edges, and squares, and cubes does a hypercube have?

3. How many vertices, edges, etc... should a 5-cube have?

4. Can you come up with formulas for an "n-cube"?

5. How many symmetries of the hypercube can you find?

Projections:

1. What are some different drawings you can make for a hypercube?

2. Can you make any symmetrical drawings?

3. Can you draw a cube without retracing or lifting your pencil off of the paper? What about a hypercube?

Foldouts:

1. How many ways are there to arrange 8 cubes in space so that each cube shares a face with another cube?

1. How many of these configurations can be folded up into a hypercube?

Slicing:

1. Which rectangular prisms can you get by slicing a hypercube? Cube? Right? Non-right?

2. What kinds of tetrahedra can you get?

3. Which polyhedra are slices of a hypercube?

4. How many regular polyhedra can you find?

5. Can you find the volume of any of your slices?