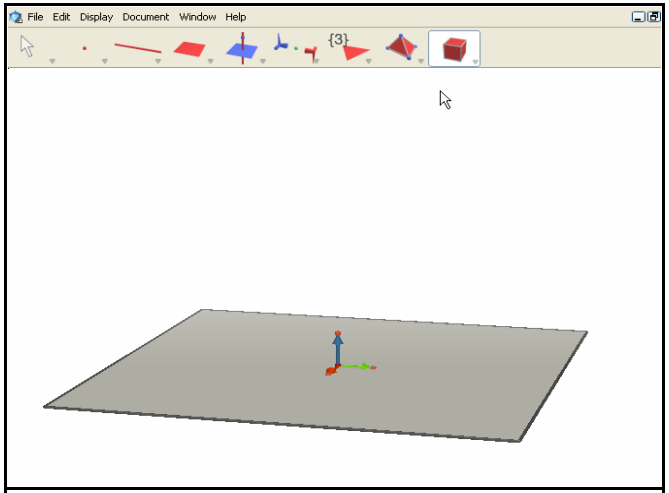
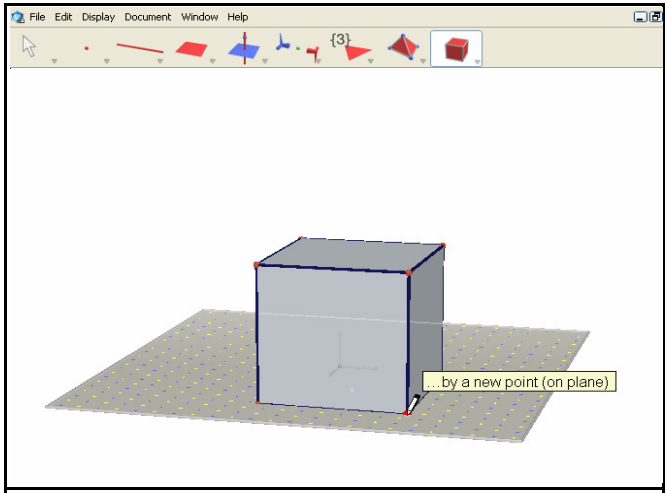
CABRI® 3D — Cube section by a plane perpendicular to one of the cube diagonals



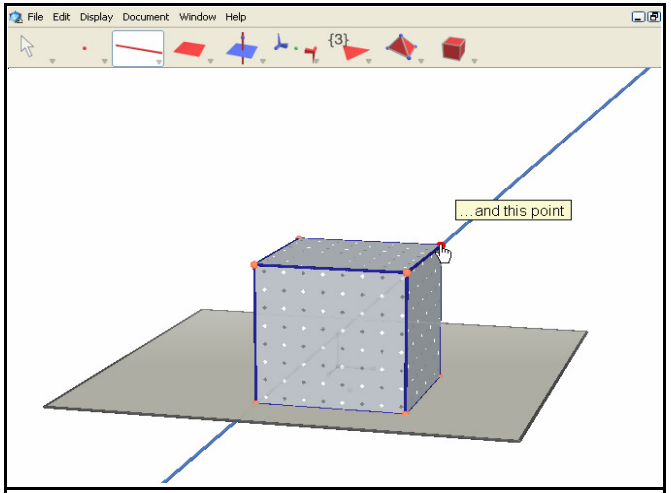
Start by constructing a cube on the grey **base plane**. Click and hold the last toolbox of the tool bar and choose the Cube tool from the drop down menu.

1



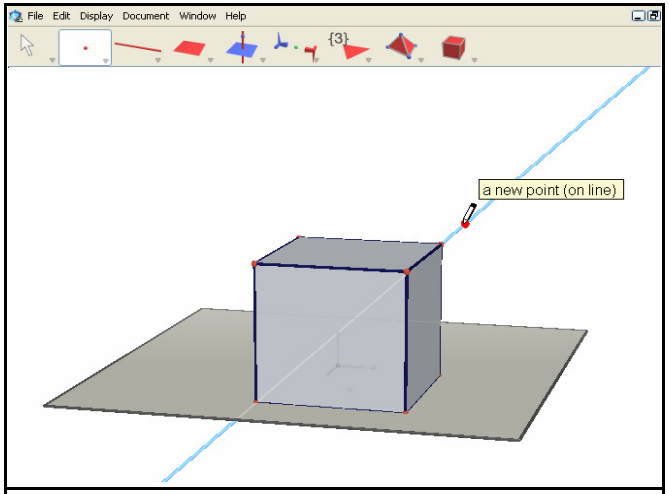
In order to construct a cube with one of its faces on the base plane, first click on the plane. Then click in two other locations of the plane, which creates the center of the bottom face and one of the vertices of the cube.

2



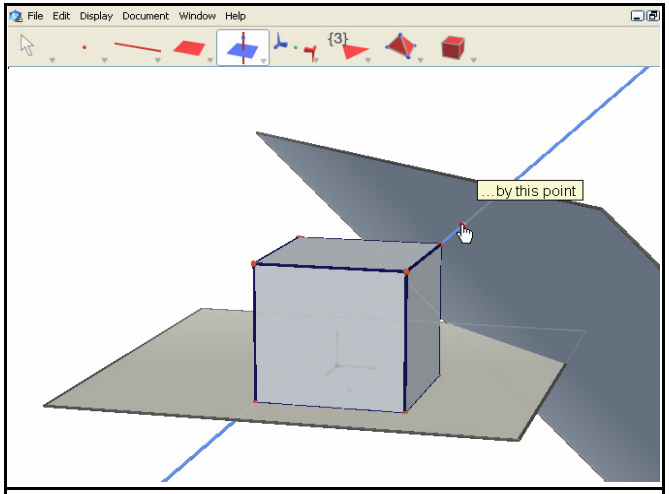
Choose the Line tool from the tool bar and select two opposed vertices of the cube, which constructs a diagonal of the cube.

3



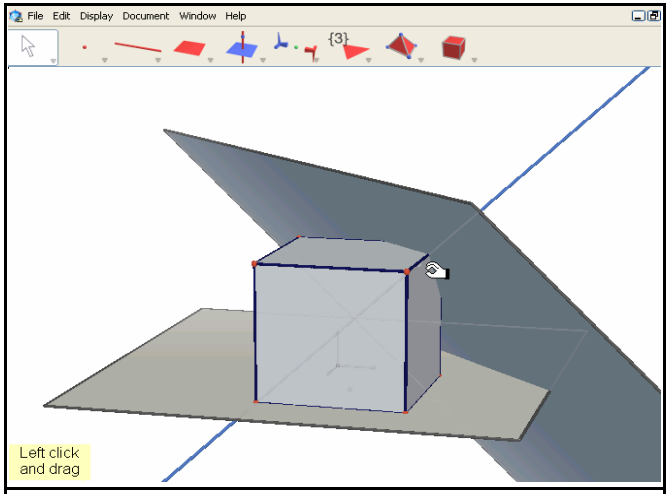
Choose the Point tool and left click on the diagonal to construct a new point. The point can be moved anywhere along the line and is constrained to remain on this line.

4



The perpendicular plane to the diagonal can be constructed with the Perpendicular tool. Select the line and the point.

5



A free object can be moved. Click on the point and move the mouse holding down the left button.

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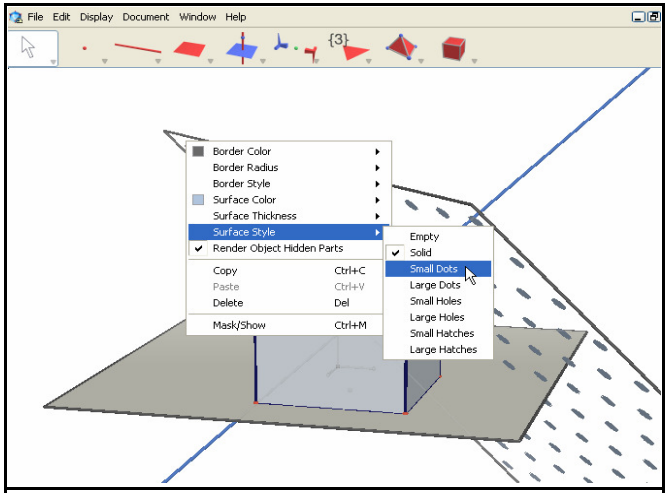
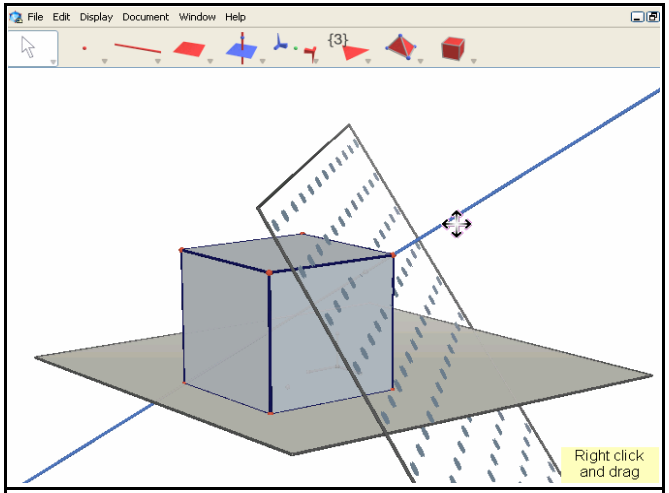
Cube section by a plane perpendicular to one of the cube diagonals



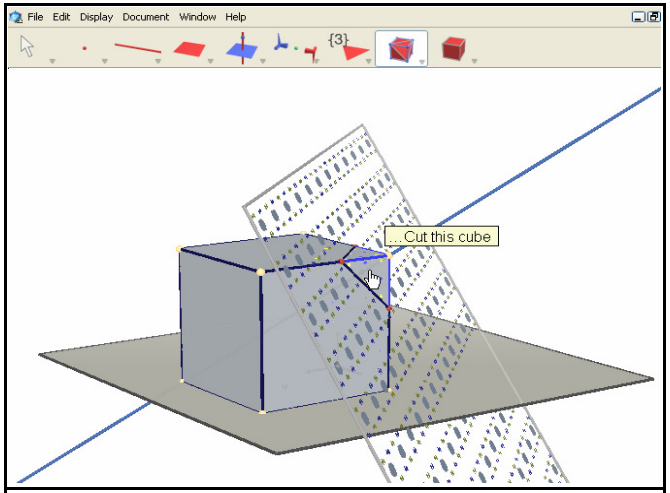
A right click on an object opens a contextual menu that allows to change the graphic attributes of the object. For example you can turn the plane into a surface with Small Dots (choosing Surface Style).

7



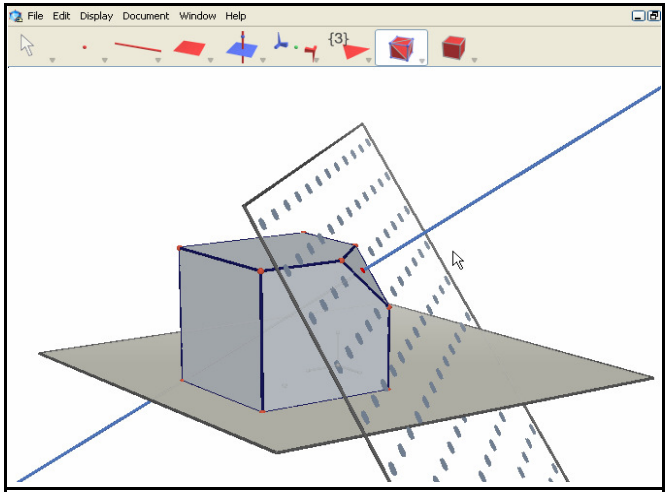
You can view your construction from various angles, as if you were moving a **glass ball**. Put the mouse anywhere in the work area, hold down the right mouse button, and move the mouse.

8



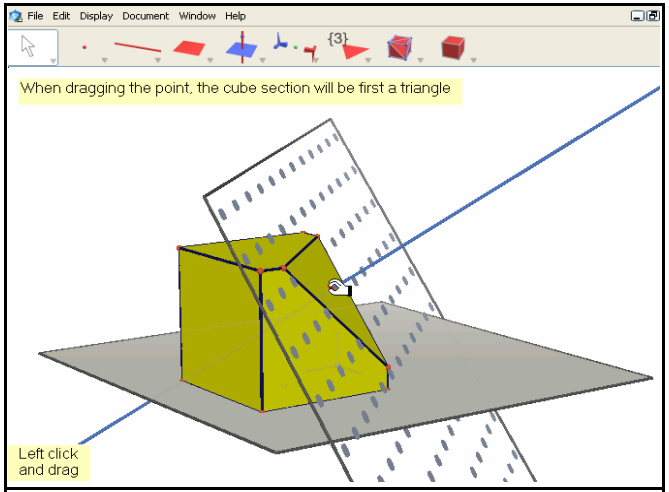
In order to better visualize the section of the cube by the plane, choose the Cut of polyhedron tool. Select the plane that separates the space in two half-spaces, then the solid that must be cut (in this case the cube).

9



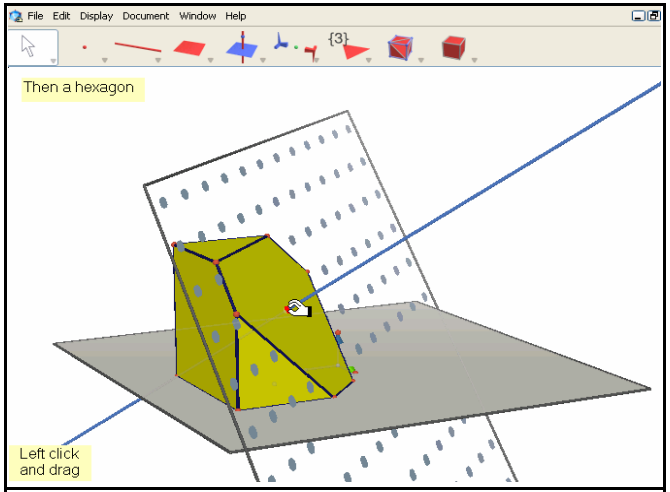
Cut of polyhedron tool results in leaving visible only the part that is not in the same half-space in which you are.

10



Like in fig.7 you can change the color of the troncated cube (choosing Surface Color).
Move the point on the diagonal of the cube and observe the shape of its section with the plane. For some positions of the plane, this section is a triangle.

11



For other positions of the plane, the section is a hexagon. When approaching the opposite vertex the section is again a triangle. Finally you can move around the construction by right clicking and dragging the mouse.

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