MATH PROBLEM OF THE MONTH (Feb/March)

Solution: 120^o

Let d be the point on the base edge of the cube so that CD is perpendicular to the base. Let s be the length of an edge of the cube.

Then AB=BC=AD=$\frac{s\sqrt{2}}{2}$. Applying the Pythagorean Theorem to ΔABC, we find that AC=$\frac{s\sqrt{6}}{2}$.

The altitude of the triangle from B to point E on AC will be a perpendicular bisector since ΔABC is isosceles. Again by the Pythagorean Theorem in ΔABE, we find that BE=$\frac{s\sqrt{2}}{4}$. Then we have the ratios of side lengths:

BE:AE:AB=$1:\sqrt{3}:2$.

From this $\angle ABE = 60^o$ and so $\angle ABC = 120^o$