

AIM Modal Analysis of a Satellite - Physics Setup

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Problem Specification

1. Start-Up
2. Geometry
3. Mesh
4. Physics Setup
5. Numerical Solution & Results

Physics Setup

The internal components of this satellite have been simplified to reduce modal analysis run time. While this CubeSat structure is simple, larger satellites often have a more complex interior with a wide array of components and structural stiffeners. Features such as small extrusions, fillets not in contact with the frame and holes may be omitted to reduce the computational load of the simulation.

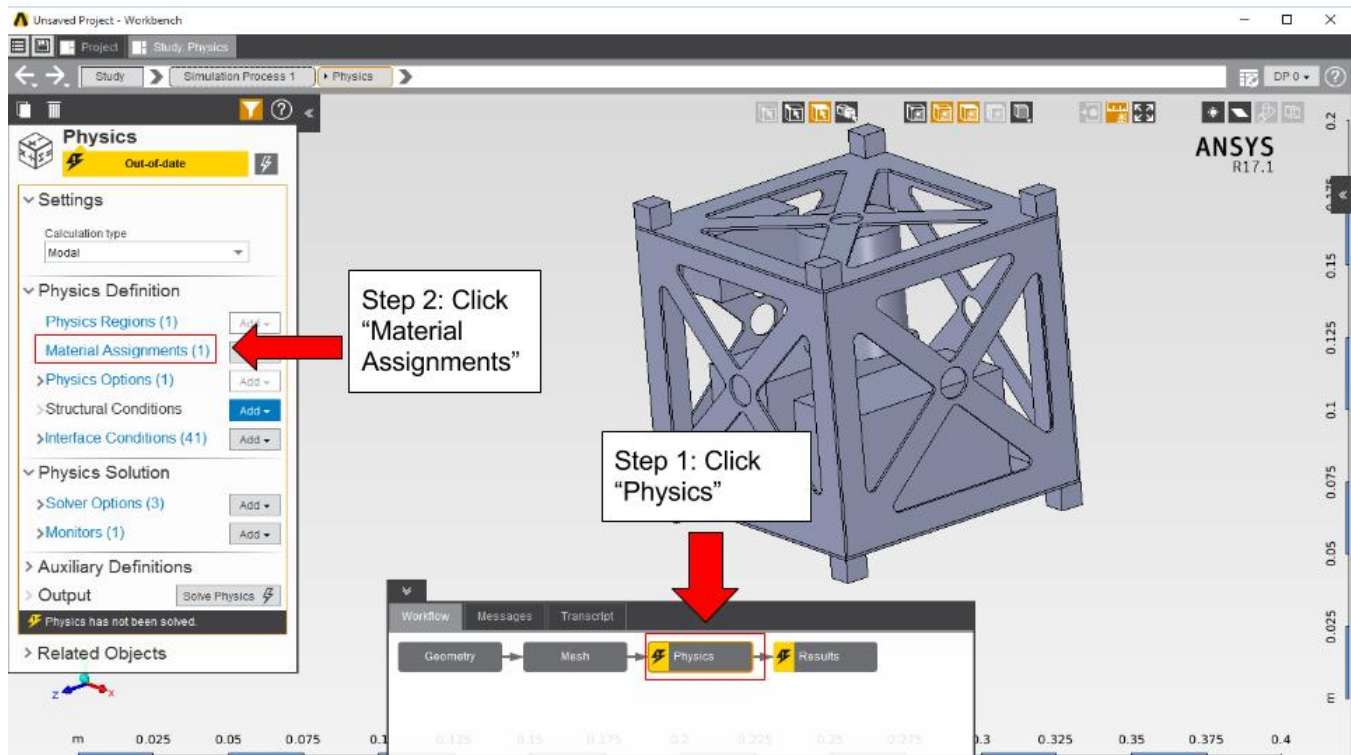
In order to simulate the mass of the internal components, we must apply a specific density to each component based on its corresponding volume. To do this, we must create a new material with a given density. It is important to note that we will only be changing the density of the material, as other material properties have little to no effect on the resonant frequency of the satellite.

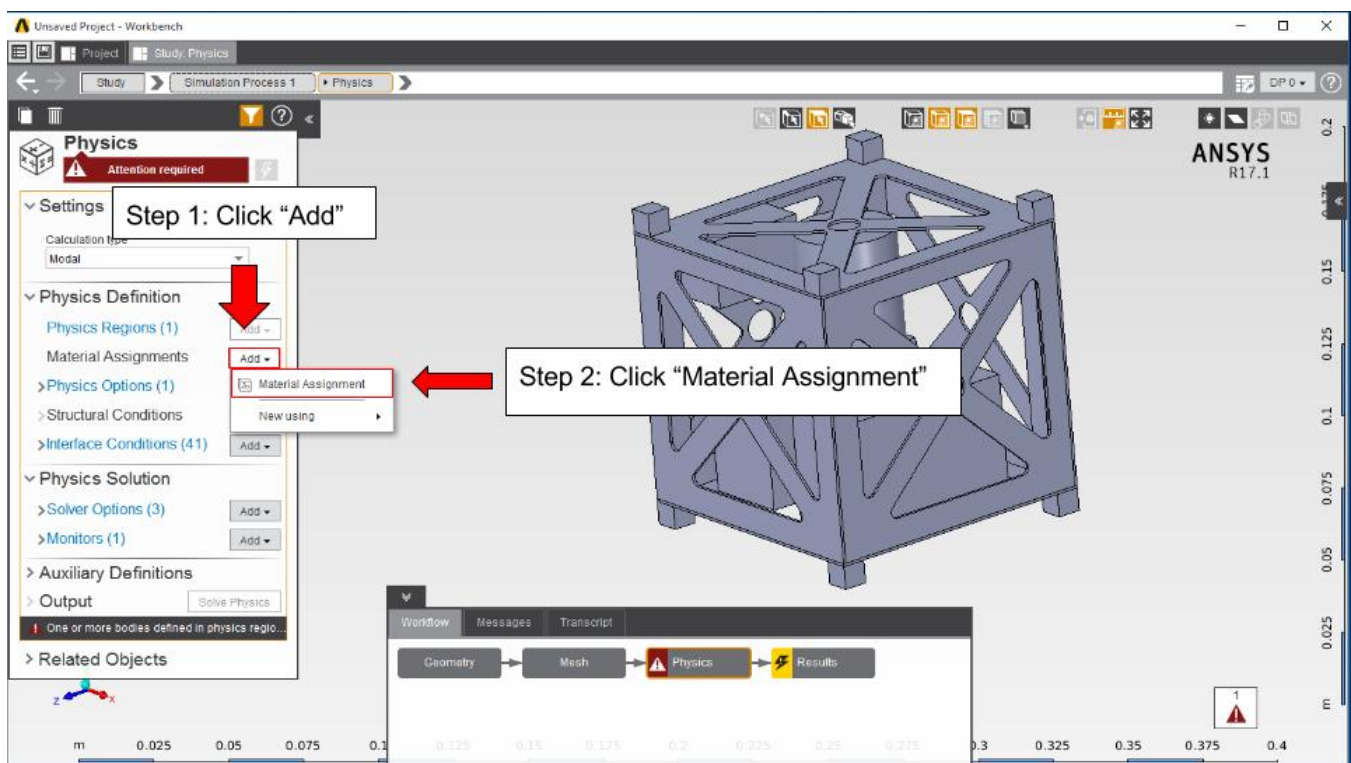
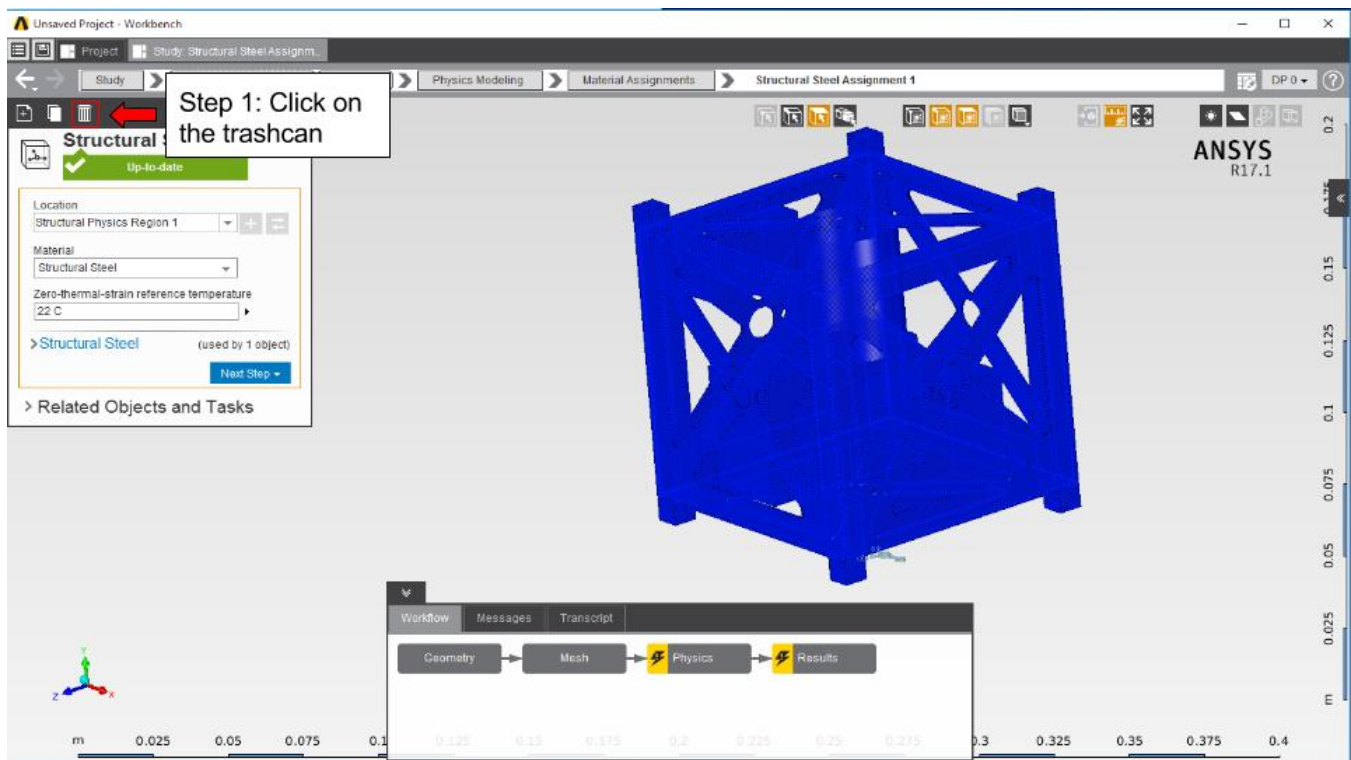
For the purposes of this tutorial, the densities for the components are:

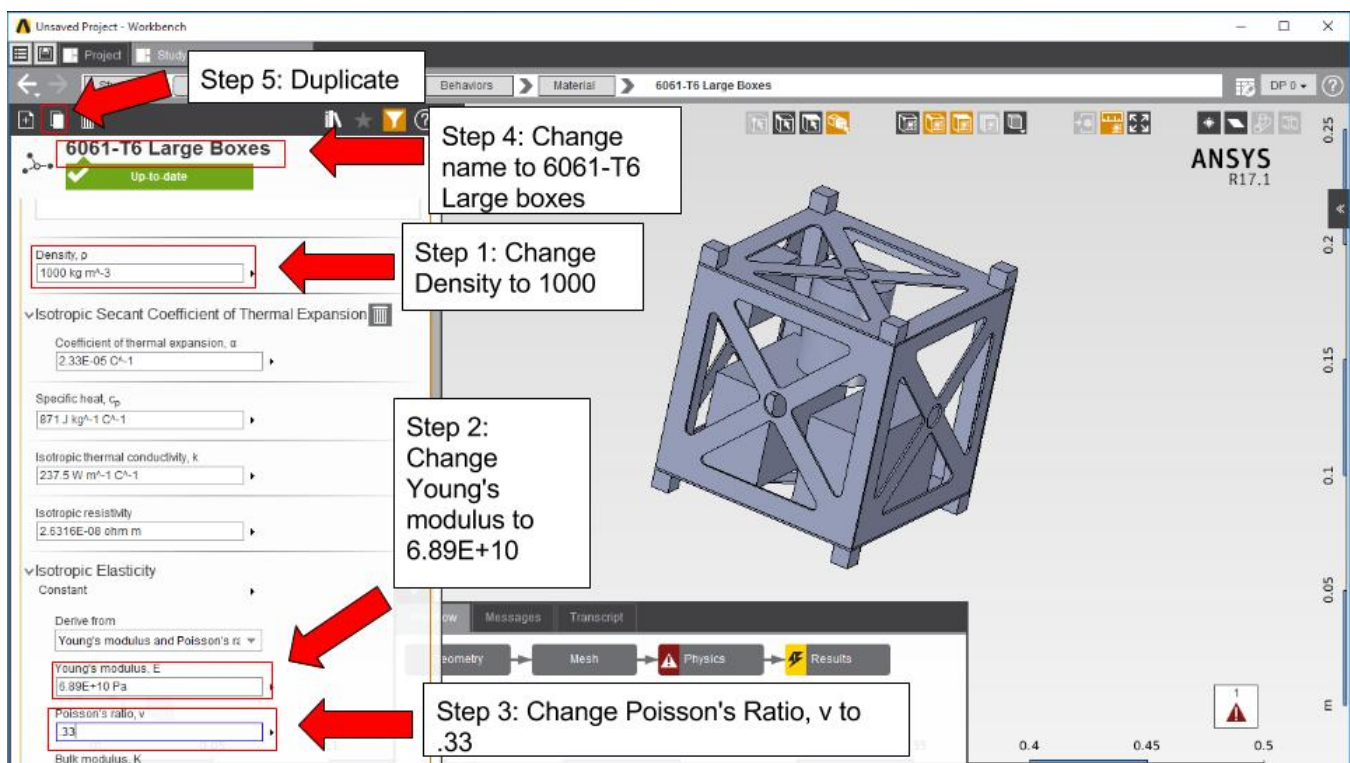
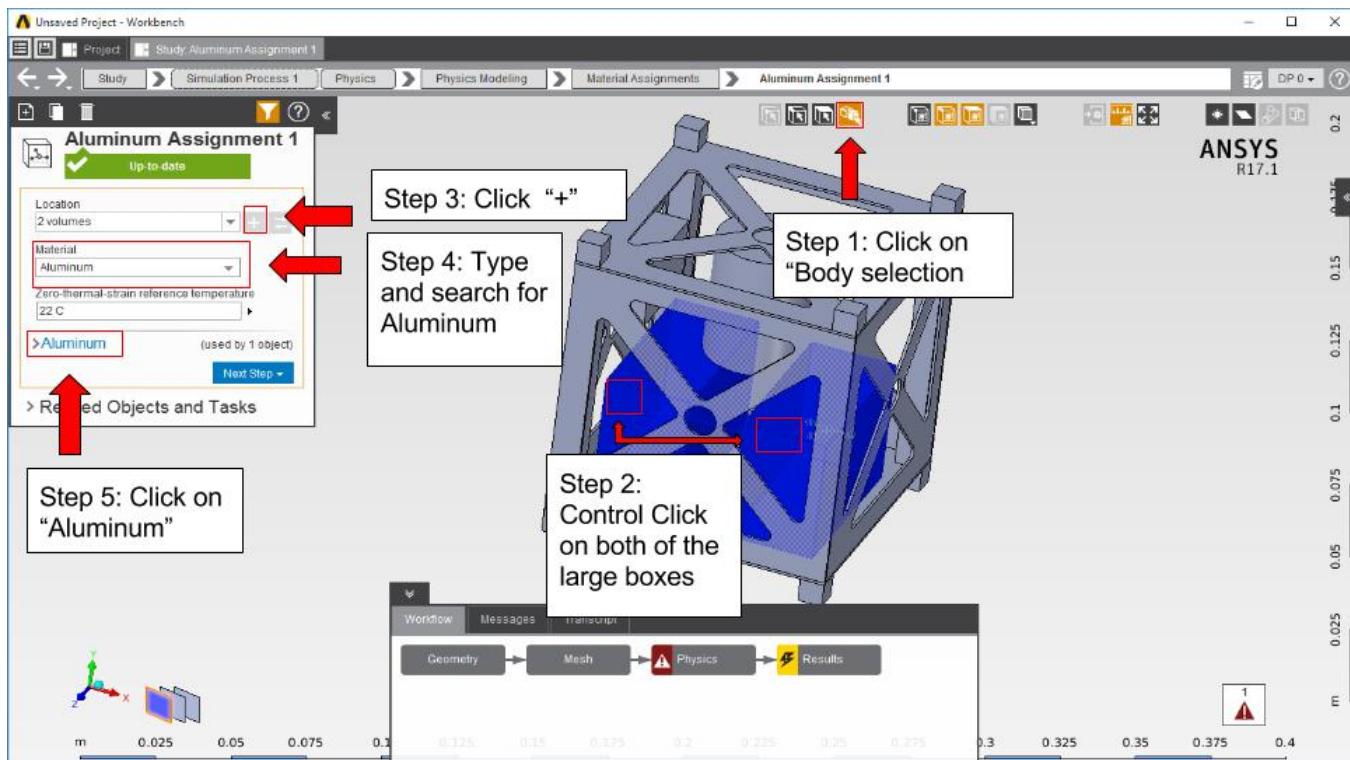
Large Box Density = 1000 kg/m^3

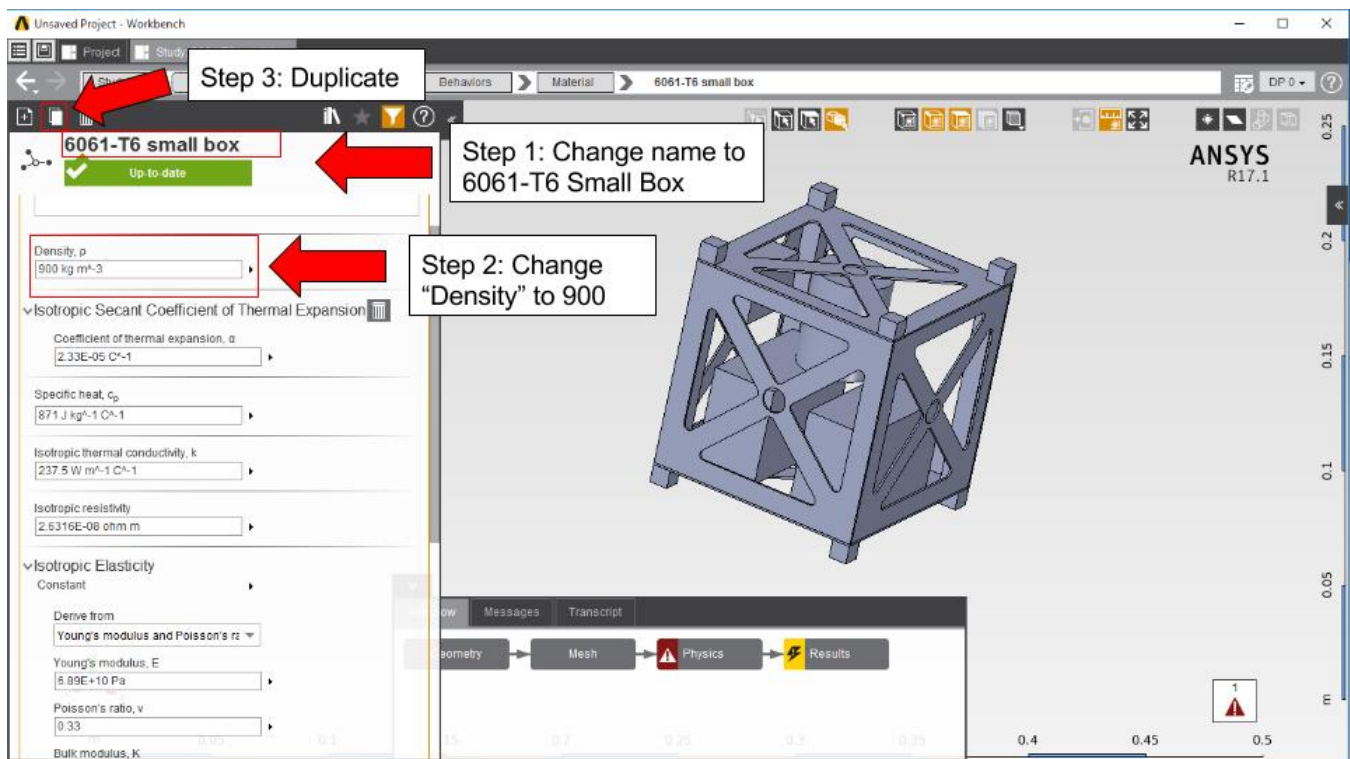
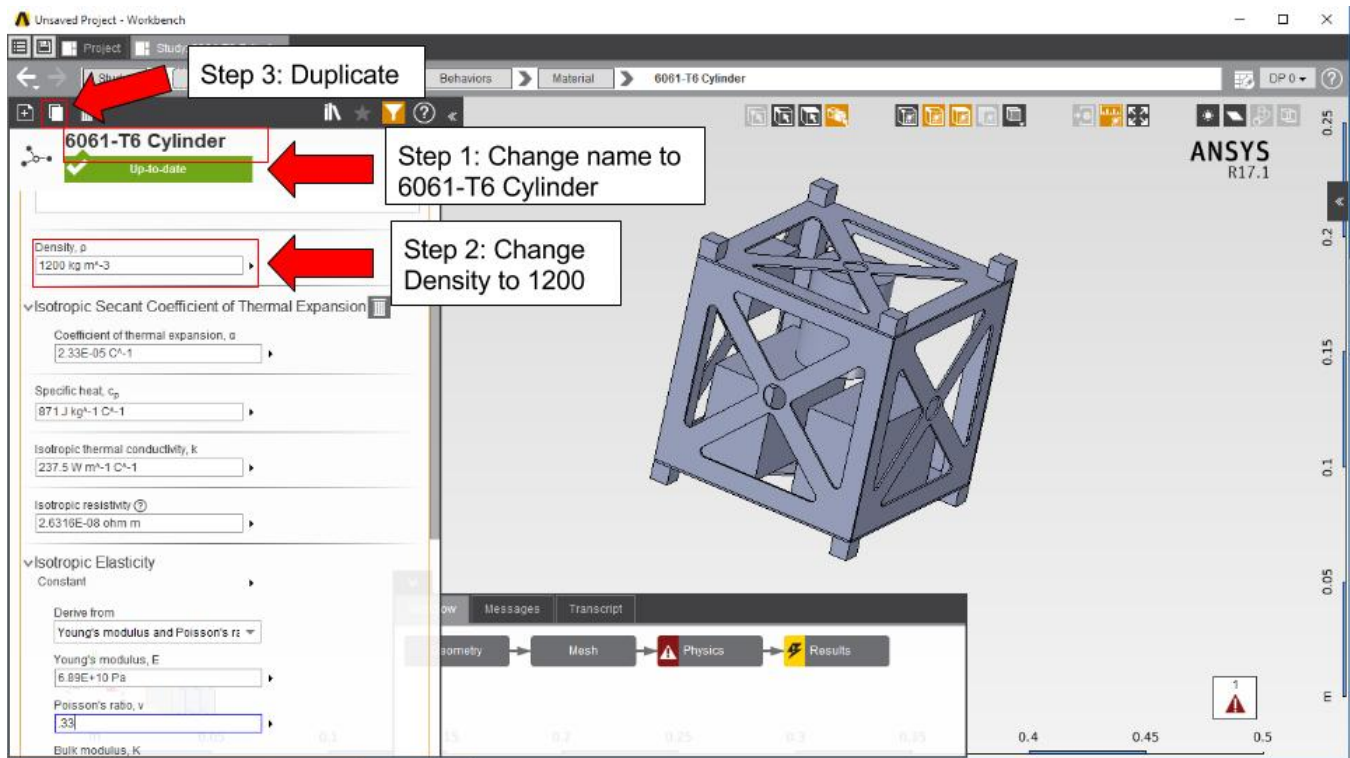
Small Box Density = 900 kg/m^3

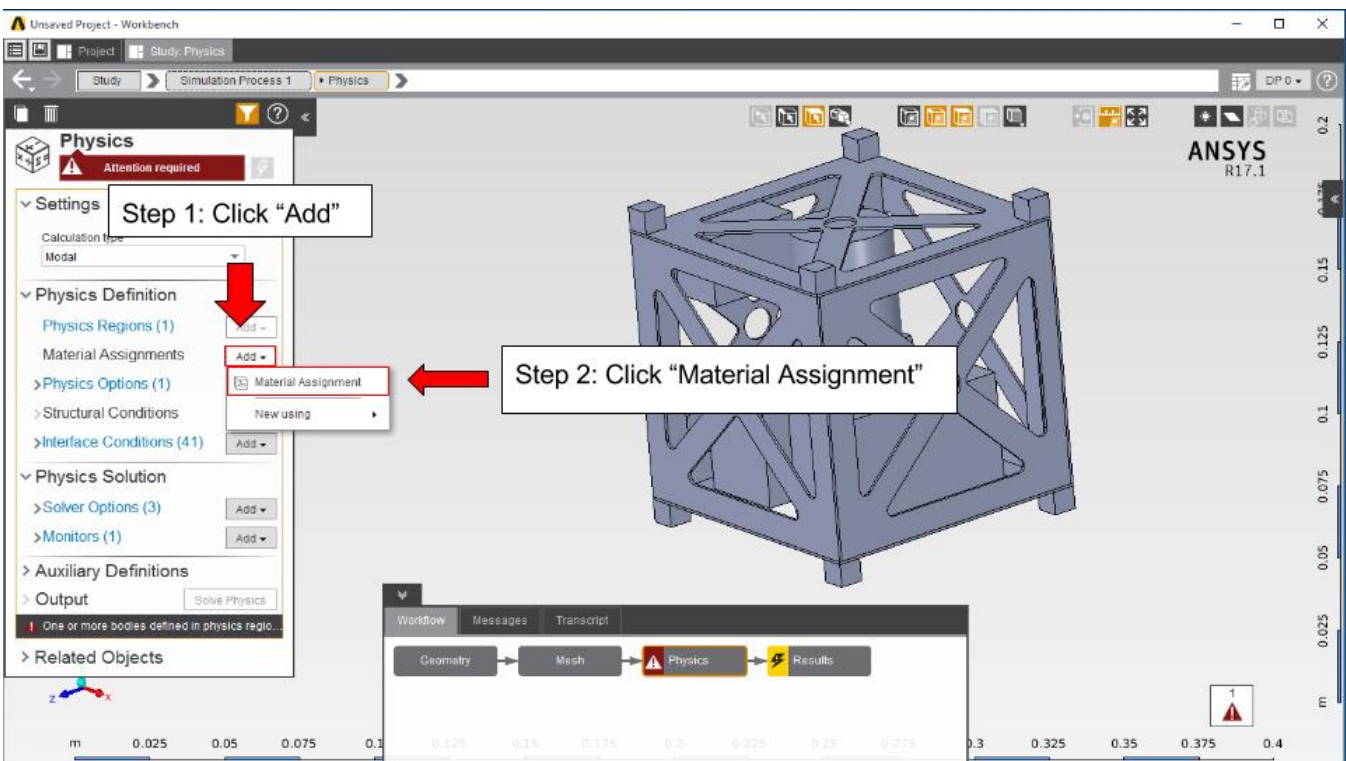
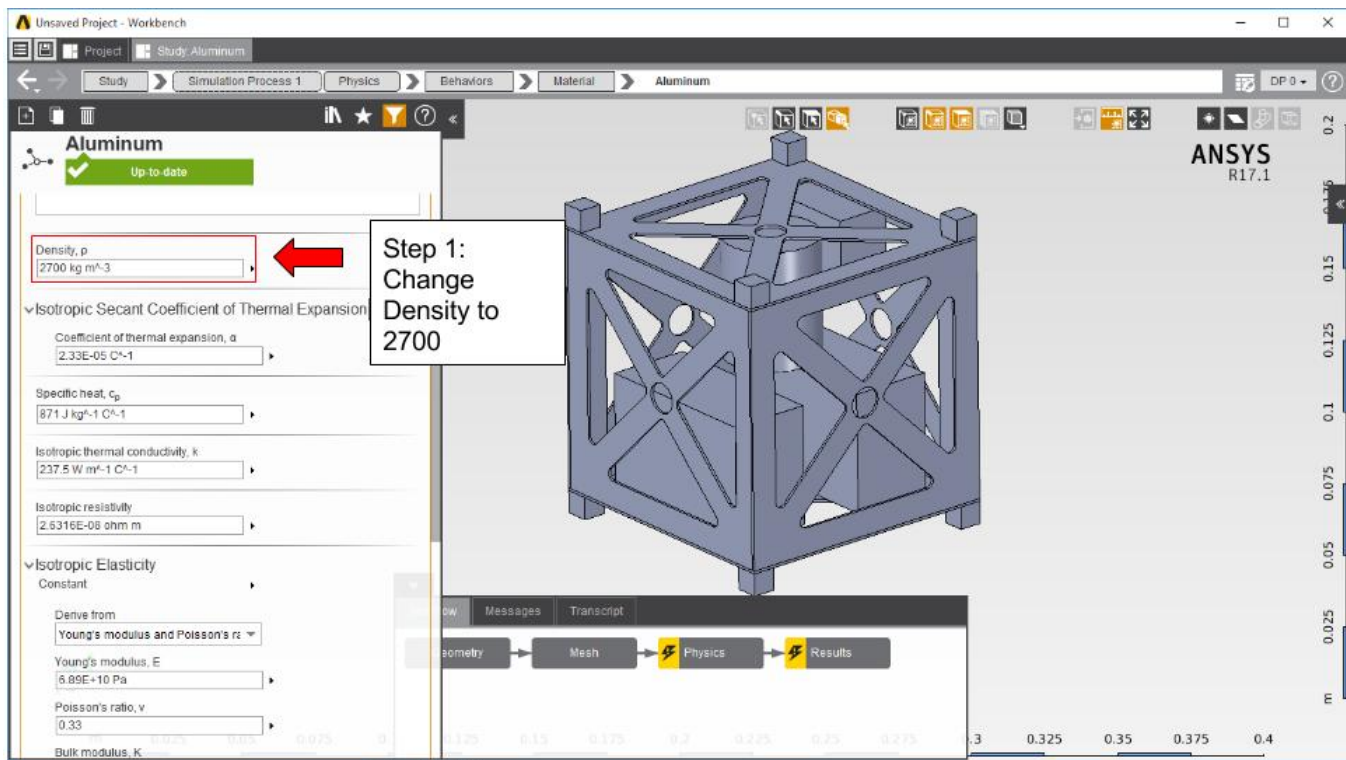
Cylinder Density = 1200 kg/m^3

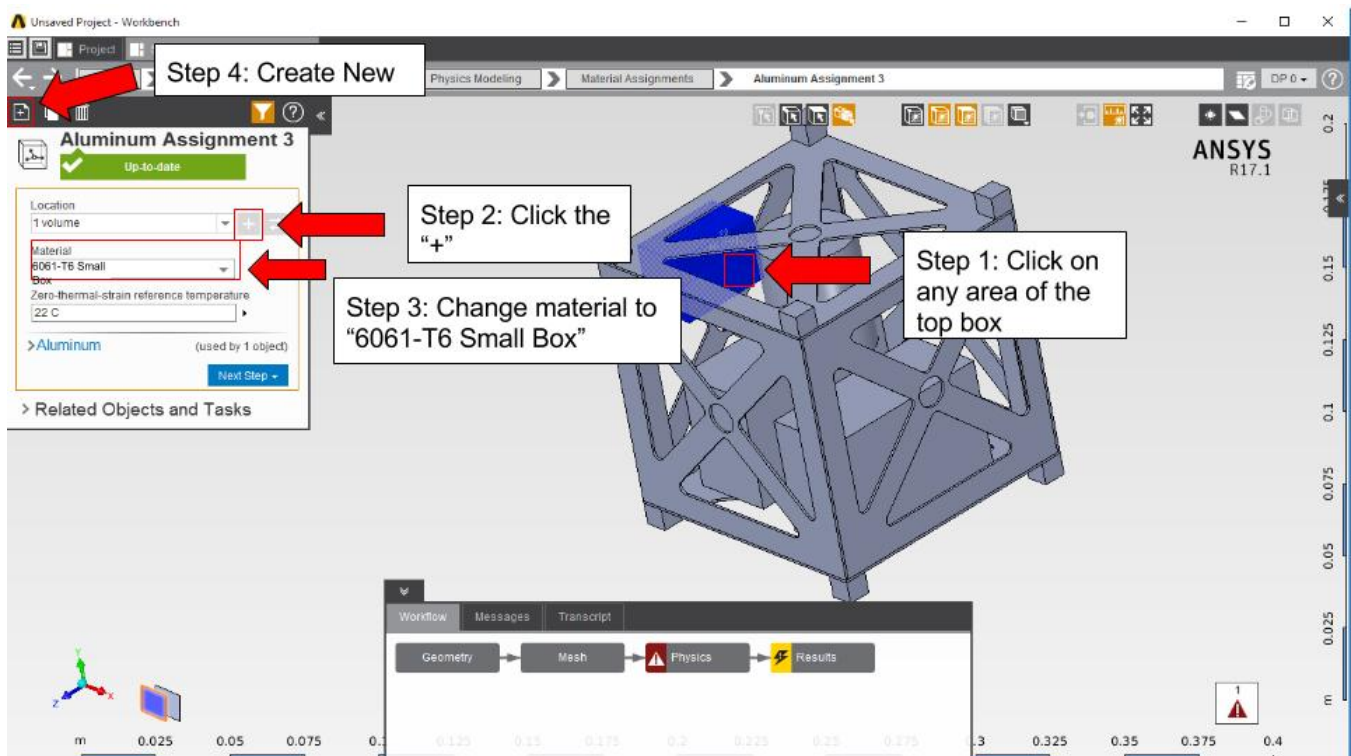
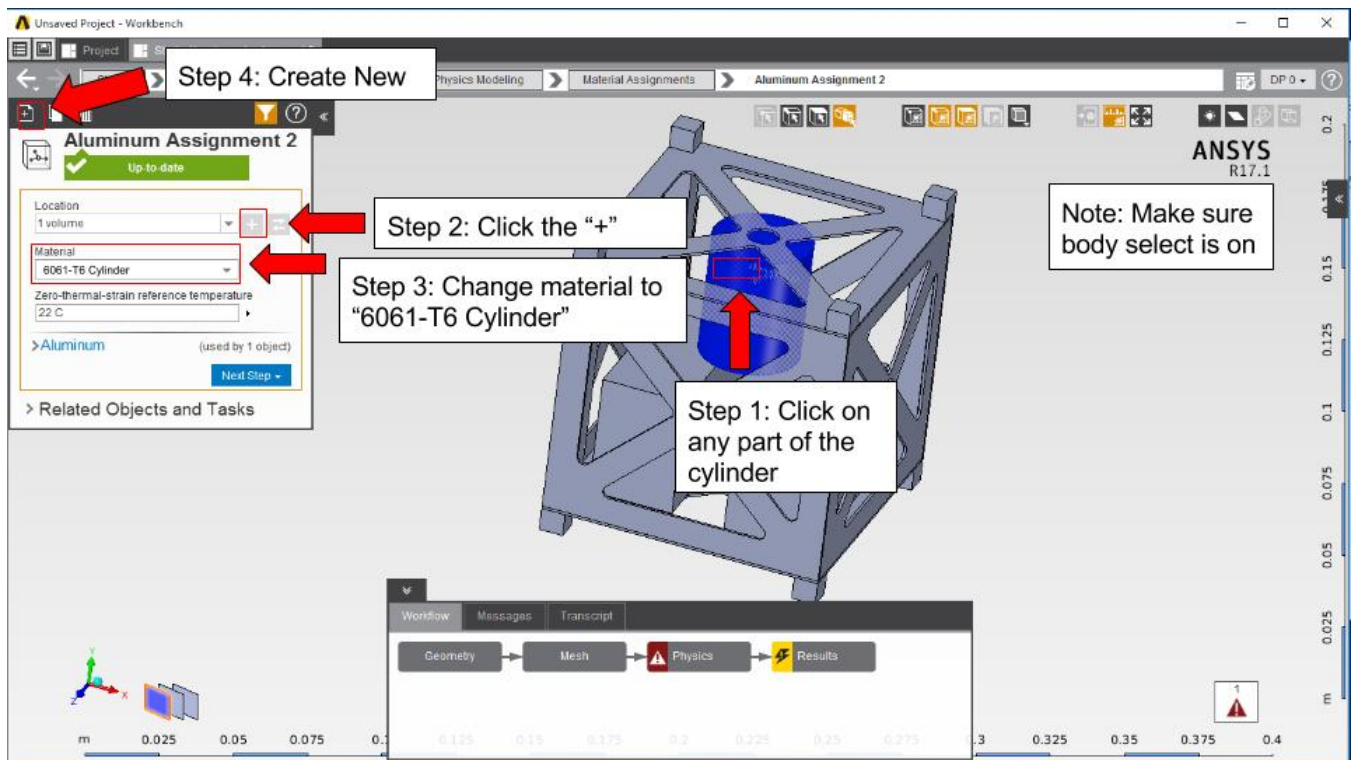


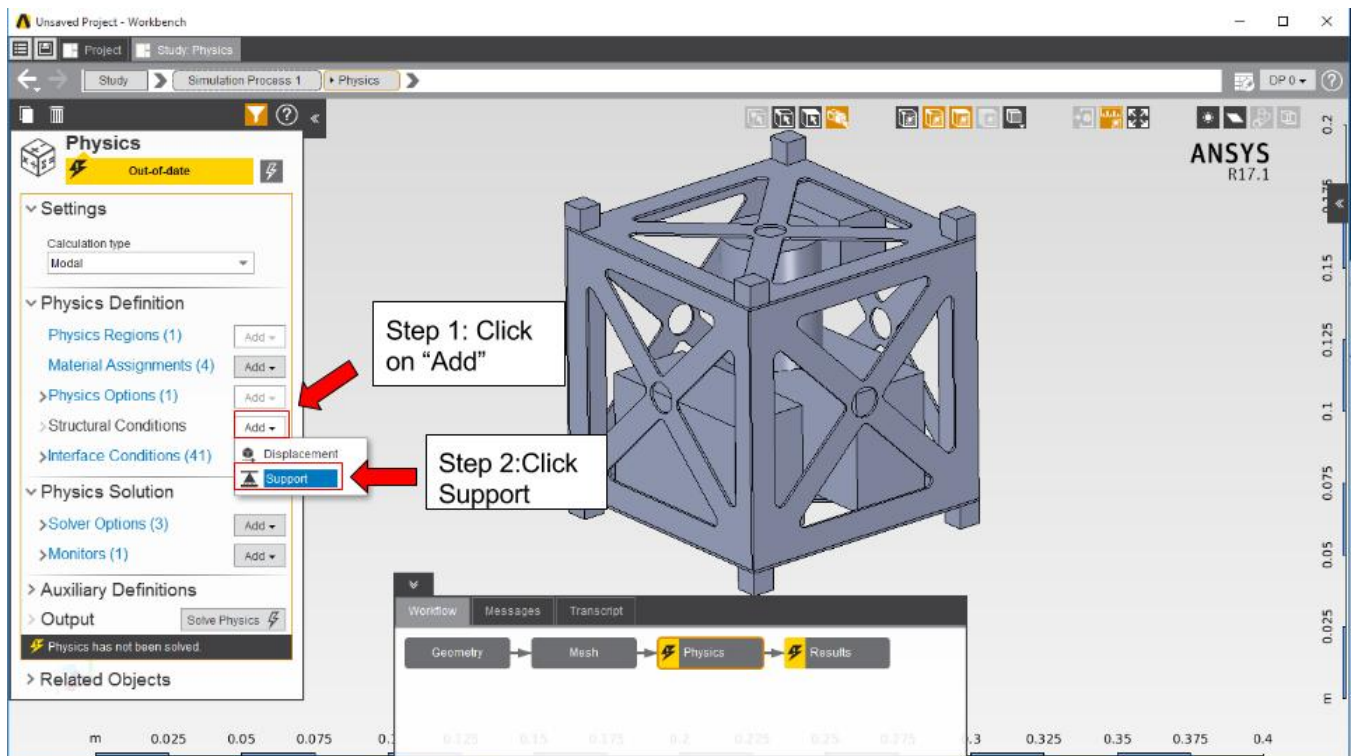
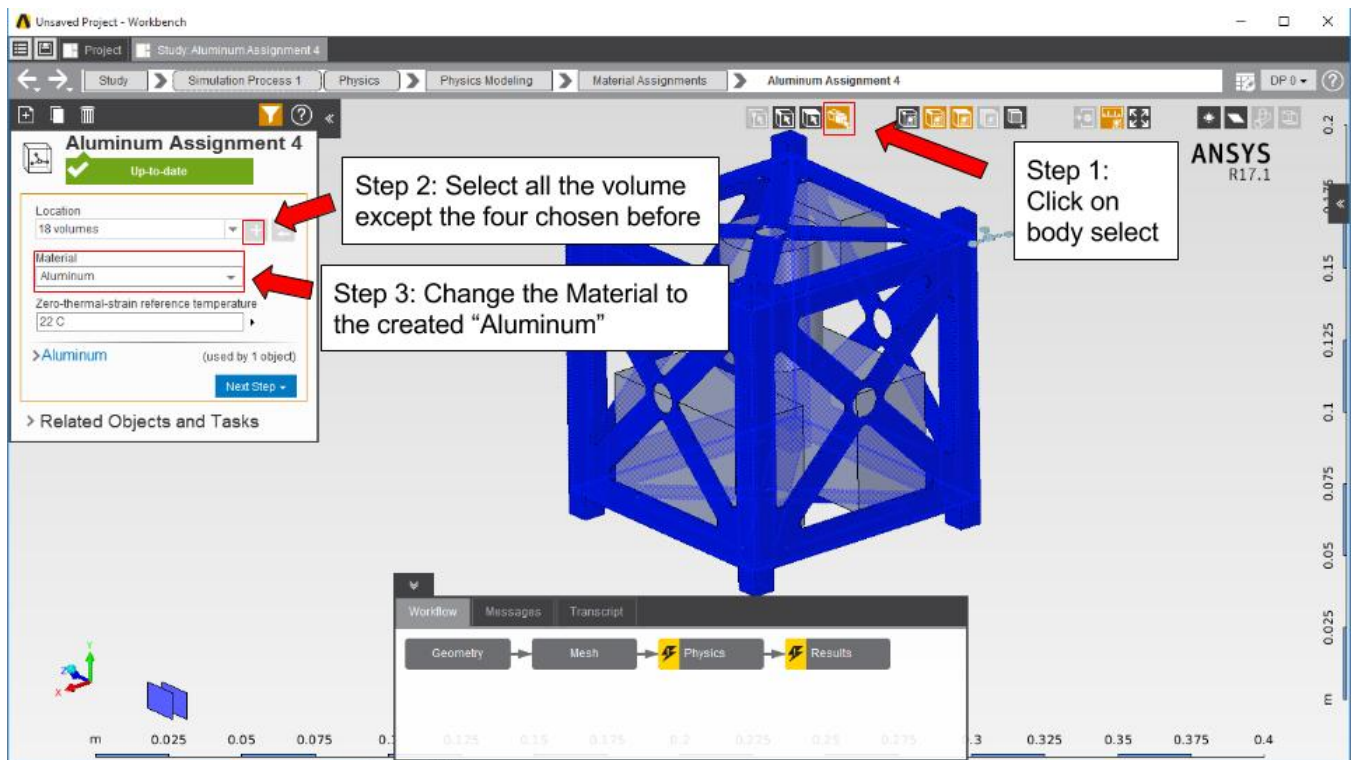


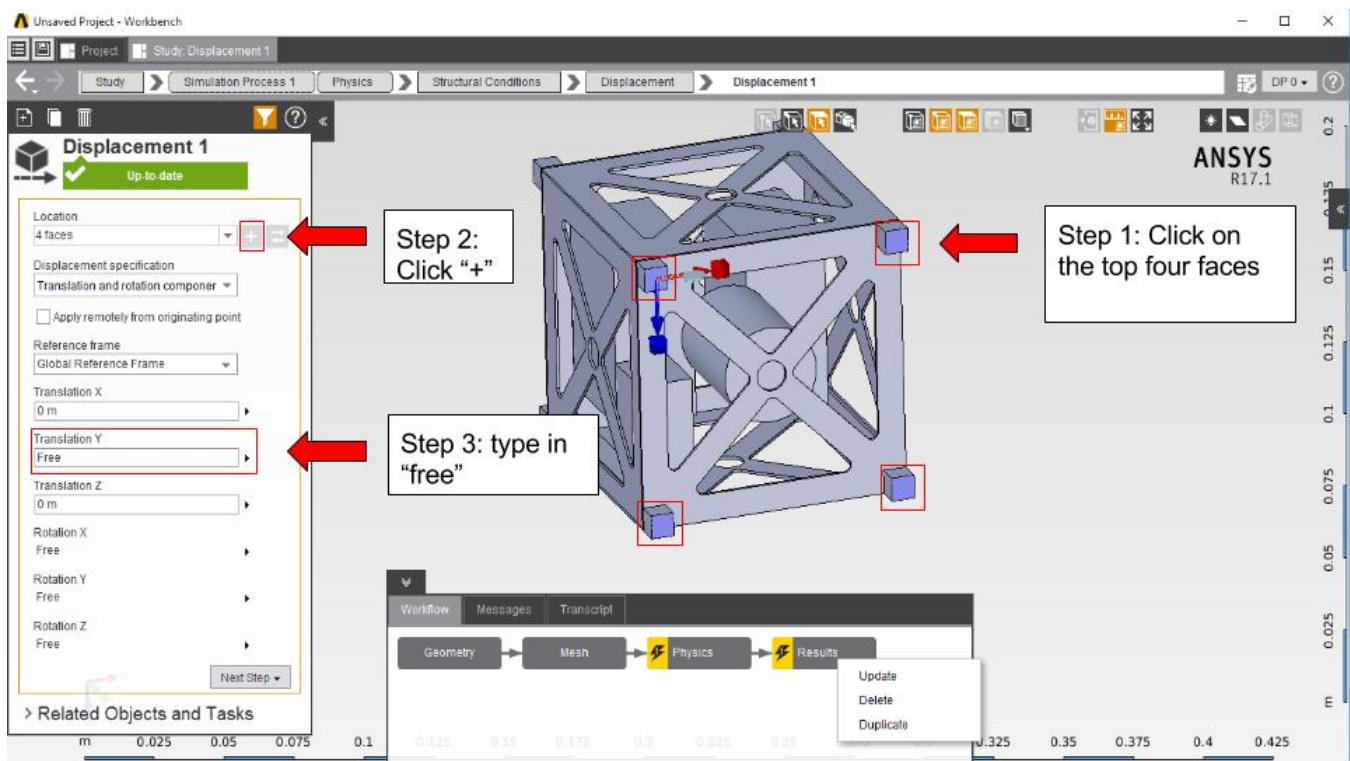
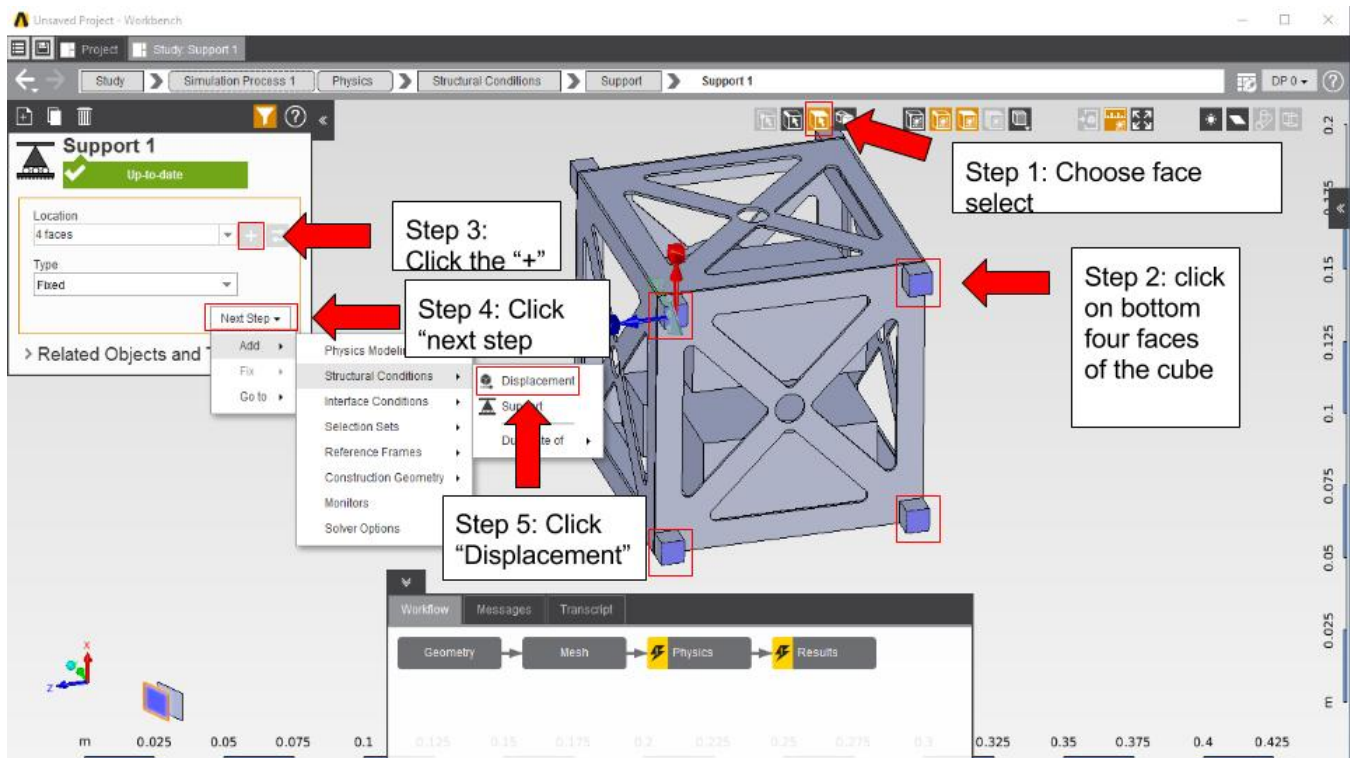












Now solve the solution.

[Go to Step 5: Numerical Solution](#)

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