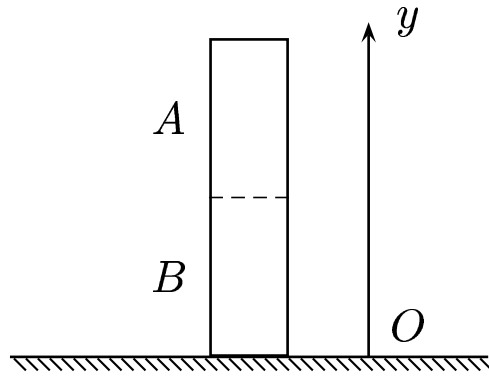


Consider the Empire State Building. For simplicity, assume that it is a tall uniform rectangular box.



Taking into account that gravitational acceleration decreases slightly with height, what would you expect?

- A)  $y_{cg} < y_{cm}$ .
- B)  $y_{cg} = y_{cm}$ .
- C)  $y_{cg} > y_{cm}$ .

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Divide the building into two equal parts as shown in the sketch.  
Center of gravity is at:

$$y_{cg} = \frac{m_A g_A y_A + m_B g_B y_B}{m_A g_A + m_B g_B}.$$

Apparently the B part has more weight.  
Answer **A**.