

**In-Class Exercise**  
**Modulus of Elasticity in Composites**  
**SOLUTIONS**

The leader's role is to make sure everyone on the team is heard and participates. The recorder writes the answer on the sheet and makes sure it is passed in. The spokesperson relays questions and answers to the class. The calculation/units expert performs all the calculations and checks the work.

Calculate the modulus of elasticity of a Kevlar® fiber-reinforced epoxy composite with 82 vol% of Kevlar® fibers positioned in the isostrain condition. E of Kevlar is 131 GPa. E of epoxy is 2.51 GPa.

$$E_{C,L} = E_{C,I} = E_M V_M + E_F V_F = 0.82 \cdot 131 \text{GPa} + 0.18 \cdot 2.51 \text{GPa} = 107.87 \text{GPa}.$$