Boomilever

Division B/C

Georgia Tech Event Workshop Series
2024-25

Science Olympiad
at
Georgia Tech®

01 RULES SHEET

02 MATERIALS + PHYSICS

03 COMMON DESIGNS

04 TIPS FROM A VETERAN

05 OTHER FREE RESOURCES

The Rules Sheet

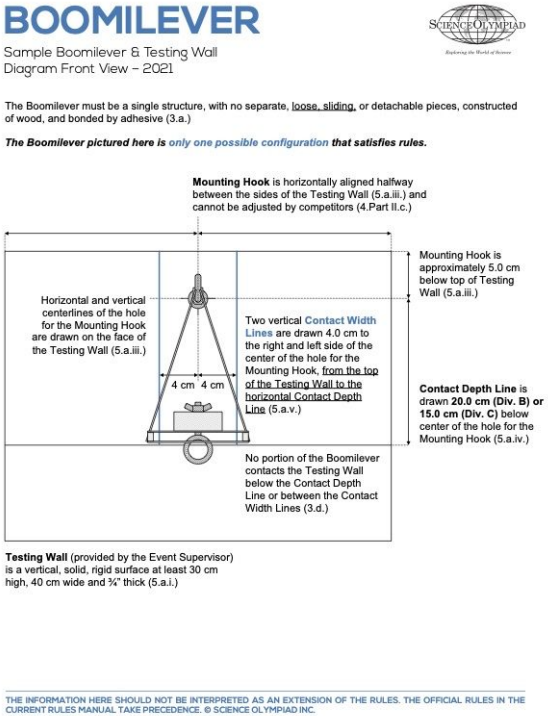
Both Division

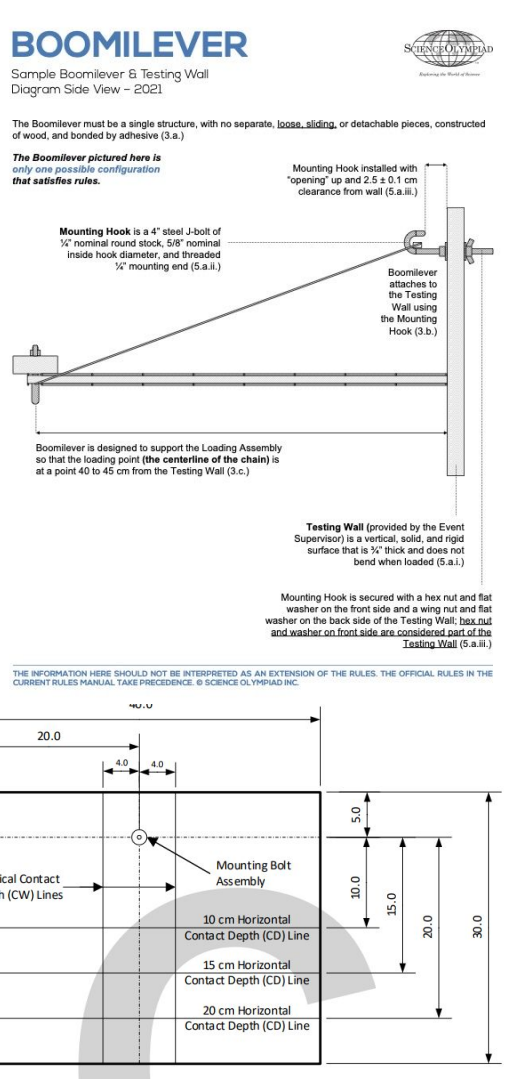
Only made from wood and any adhesive

MIDDLE of block 40-45 cm away from wall

Scoring = (Weight held + bonus)/ weight of boomilever

Division B	Division C
20 cm non-bonus 15 cm bonus	15 cm non-bonus 10 cm bonus
Between 4 cm lines	Outside 4 cm lines






Materials +
Physics (very fun)

Topic 1: Balsa and Bass Wood

Balsa Wood

- Density varies a ton on the lower ends 5-15 lbs/ft^3
- Good for compression

Bass Wood

- Density varies very little on the higher ends 25-35 lbs/ft^3
- Good for tension

Topic 2: Adhesives

- Ca glue brands

Bobsmith (my favorite), loctite, and sunbelt
Set quickly
Different viscosity: super thin, thin, medium, and thick

- Wood glue

Stronger but heavier
Takes a bit to set

- Epoxy

Very strong
Takes a bit to set
Can be toxic

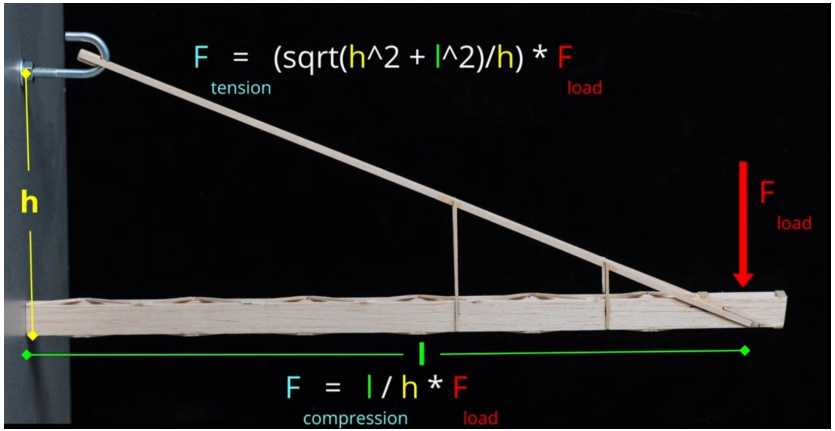
Topic 3: forces + Euler's

- Division B

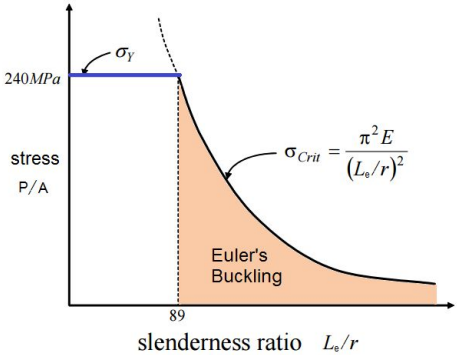
20 cm 29.1 kg tension 27.3 kg compression
15 cm 43.7 kg tension 41 kg compression

- Division c

15 cm 43.7 kg tension 41 kg compression
10cm 63.3 kg tension 61.5 kg compression



Euler's Critical Load Law
Essentially at half the length 4x the buckling strength



$$P_{cr} = \frac{\pi^2 EI}{(KL)^2}$$

COMMON Designs

Division B Design 1

Compression
Sides 1/8in main beams + 1/16 supports
1/16 crossmembers

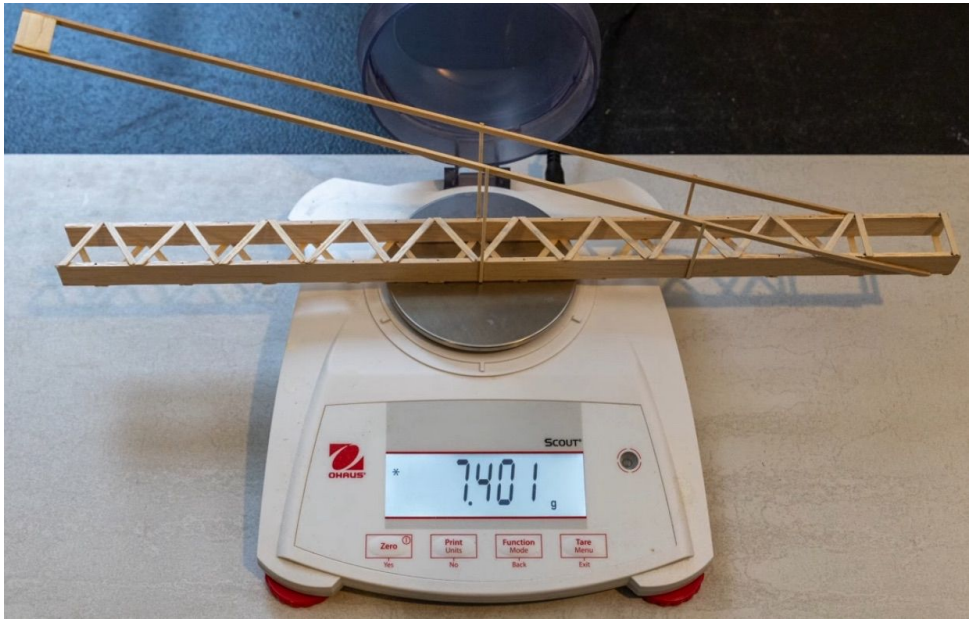
Tension
1/16 x 1/16 beam
Unknown bass wood block

Division B Design 2

Compression
Sides 3/32 x 15mm
1/32 x 2.5mm crossmembers

Tension
1/16 x 3/32 tension beam
3 of 1/8 x 3/16 block

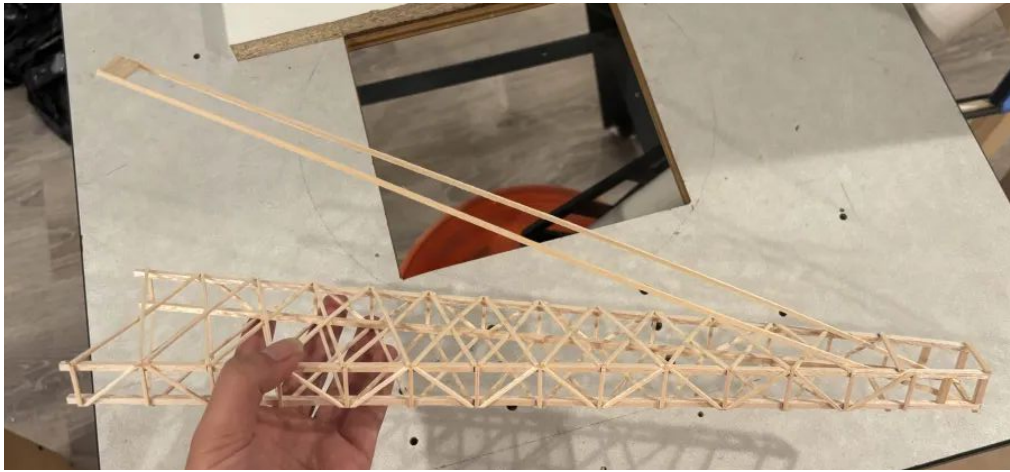
Verticals
1/32 x 1/16



Division C design 1

Compression
Sides 1/8in main beams + 1/16 supports
1/16 crossmembers

Tension
1/16 x 3/32 beam
4 of 1/16 x 3/32

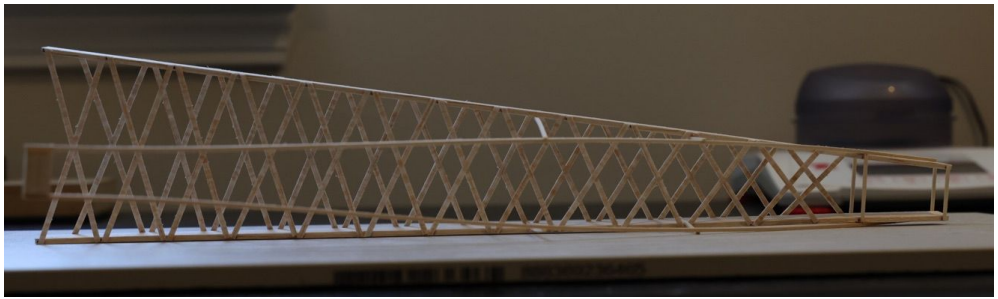


Division C design 2

Compression
Sides 3/32 x 15mm
1/32 x 2.5mm crossmembers

Tension
1/16 x 3/32 beam
3 of 1/8 x 3/16 block

Verticals
1/32 x 1/16



Tips from a Veteran

- Building and logging

Choosing wood
Make tons of joints
Take measurements of everything and log them

- Preparing for competition

Practice setting up the boomilever with someone timing you
Practice handling the boomi

- During competition

Ask questions
Calm down

Additional Resources

“Balsa Engineering” on Youtube

“Science Olympiad Balsa Event Autoloader” On Youtube

Boomilever Guide

Resource 4

THANKS!