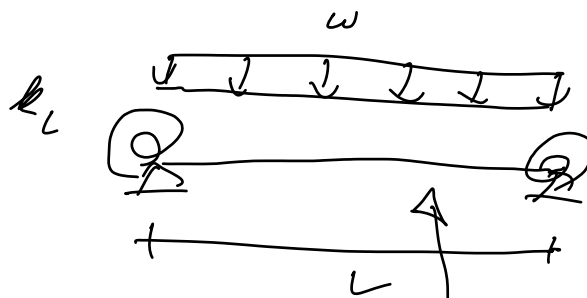
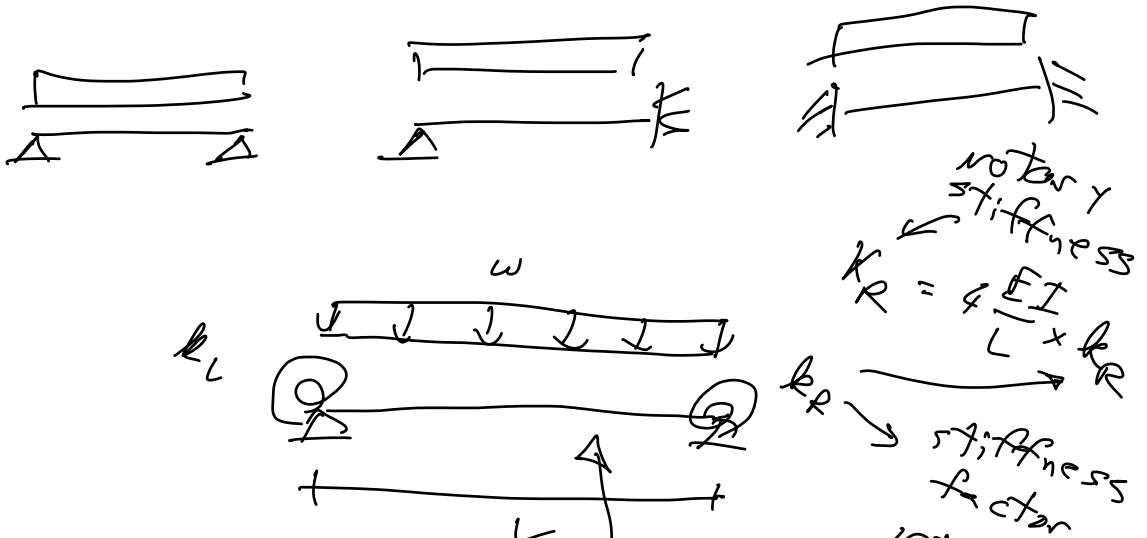
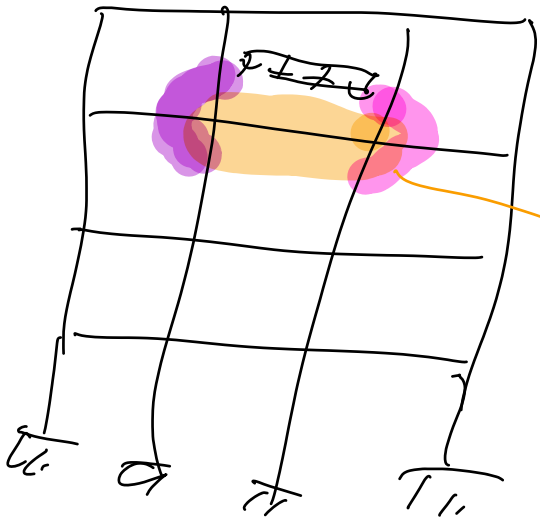


CIE 418: Lecture 6, Nov 15



$$\frac{\sum \left(\frac{4EI}{L} \right)_{\text{attached}}}{4 \left(\frac{EI}{2} \right)}$$

beam on column being considered



$$\frac{wL^2}{8}$$

Cyclic loads

weight

Wind

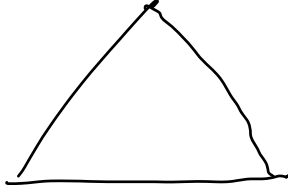
Earthquakes

People

Cars

Loads

Geometry



Material

x-sections

area

shape

Length

connections

stiffness

strength

toughness

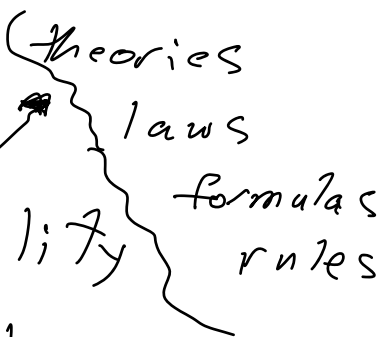
Engineers design

→ plans, specifications,
blueprints ...

⇒ Emphasis is on How
to do or build something

Scientists

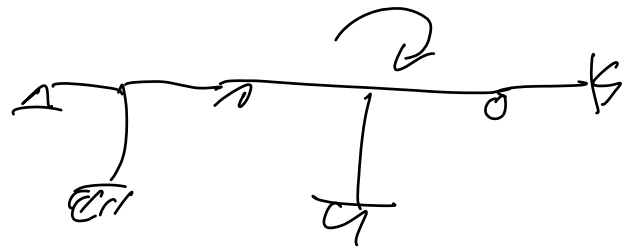
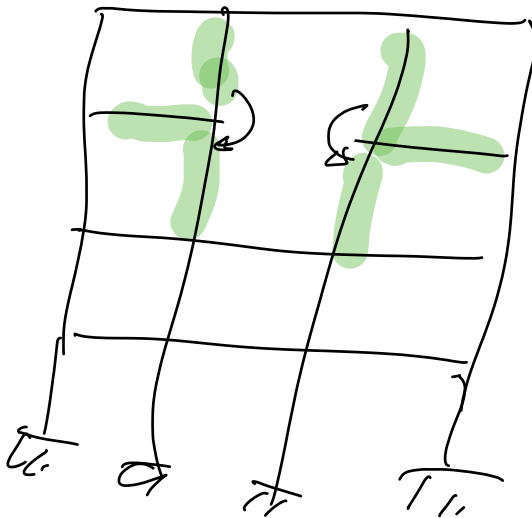
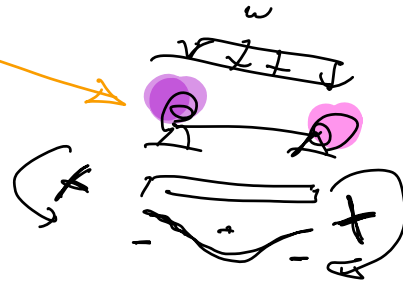
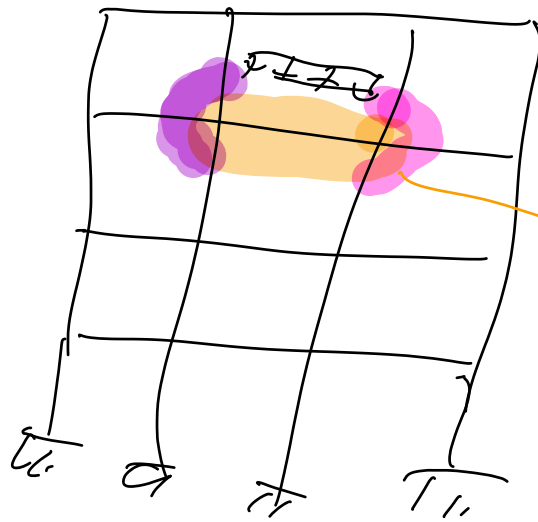
→ create/discover
models of reality



theories
laws
formulas
rules

⇒ Tell stories of why
something behaves or
works in certain
(stories based on experiments)

★
Queen RULES



Demo:

Diagram showing a beam with a load w (force/length) and a reaction force R_L . The beam is supported by a roller and a pin. The load is applied over a length L . The effective length L_{eff} is defined as $L_{eff} = (1 - 0.104 - 0.178)L$.

$$M_{pos\ max} = \frac{w L_{eff}^2}{8}$$

$$= (1 - 0.104 - 0.178)^2 \frac{w L^2}{8}$$

Diagram labels: d_{IL} (0.104), d_{IR} (0.178), R_L (0.92 k_L), $L_{eff} = (1 - 0.104 - 0.178)L$.

$$M_{\text{left}} = \frac{w \times d_{IL} \times (L_{\text{eff}} + d_{IL})}{2}$$