Principles of Stability

1. Low Wide Base
   - A structure is more stable when its center of gravity is lower to the ground
   - A wide base allows a structure more opportunity to keep the thrust line within the base

2. Firm Foundation
   - Last class we saw that solid dirt is better than loose dirt
   - Dig down to solid ground
   - Make a solid foundation (that is why they put gravel under roads when paving)
   - We also saw that a larger surface area of the base will lead to more stability
   - Spread the load (use a thicker foundation)
   - Moisture in the ground can cause the soil to lose its firmness

3. Balanced Forces
   - Recall that when forces in an object are not equal, it will move
   - Two equal and opposite forces do not cause movement
   - If something is balanced, it will be stable
   - Example: tug-of-war, crane with counter weight, cables on boat masts
     (need high tensile strength)

4. Vertical Forces
   - Arches transfer forces around the curve towards the ground vertically
   - Trusses also use shape to align forces with ground

5. Rapid Rotation
   - A bicycle is more stable when you ride fast than it is when you ride slow
   - Figure skaters can stay upright on the tip of their blade when they spin rapidly