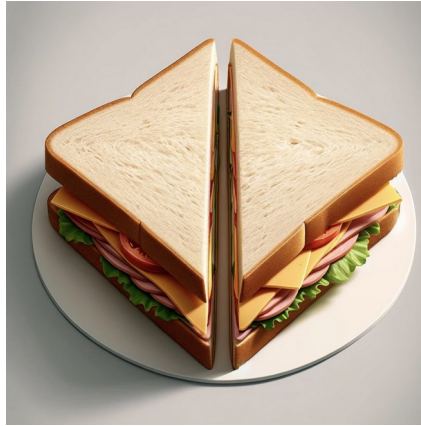


## Equation of perpendicular bisector (AI SL 3.5)

### Intuition Pump for Understanding the Equation of a Perpendicular Bisector:



1. **Sandwich Analogy:** Imagine a sandwich cut diagonally from corner to corner. The cut represents the perpendicular bisector, dividing the sandwich into two equal triangles and doing so at a right angle to the sides.
2. **Door Hinge and Swing:** Picture a door swinging open. The path the edge of the door takes is perpendicular to the hinges. If you drew that path, it would cut the angle of the open door in half, bisecting it.
3. **Hands-on with String:** Take a piece of string and stretch it between two points (the ends of a segment). Pluck the string from the middle, and it will snap back to the midpoint, creating a perpendicular bisector of the string's original position.
4. **Drawing Exercise:** Draw a line segment on a piece of paper and use a ruler to find its midpoint. Then use a protractor to draw a line at a 90-degree angle from the midpoint. This is the perpendicular bisector.
5. **Balancing Act:** Think of a seesaw with two unequal weights at each end. You adjust the position of the fulcrum (the midpoint) until the seesaw balances perfectly horizontal. The line that the fulcrum would trace, if moved along this balanced line, is the perpendicular bisector.
6. **Mirror Reflection:** If a light beam hits a mirror on the wall at a right angle, it reflects back on the same path. Now imagine the beam comes from one corner of a room to the opposite corner; the mirror's position that causes this perfect bounce-back is along the perpendicular bisector of the room's diagonal.
7. **Equation Derivation:** Take a line segment with endpoints A and B. Use the midpoint formula to find the middle point (M). Then, knowing the slope of line AB, find the negative reciprocal (the slope of the perpendicular line). Finally, use the point-slope form of the equation to write the equation of the line passing through M with the found slope.

8. Sports Field Lines: Consider the line marking the halfway point of a sports field, like a football pitch. It's equidistant from all points on the two goals and perpendicular to the sideline, acting as a perpendicular bisector.

By engaging with these everyday scenarios and hands-on activities, students can build an intuitive understanding of what a perpendicular bisector is and how to derive its equation.

