

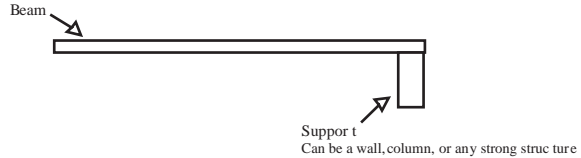


Engineering with Legos : Sturdy Structures

Name: _____

Cantilever

A cantilever is a long beam attached only on one end. Cantilevers are used all throughout construction. Some examples are bridges, balconies, some shelves, and brackets that stick out from a wall. If you point your arm straight out it is now a cantilever. Your arm is attached to your body on one end!



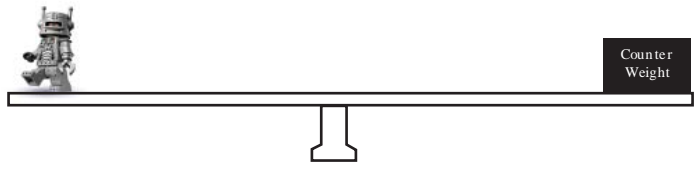
When a cantilever is built correctly, it can carry weight at the ends without breaking or falling over.



When designing a cantilever it is important that :
 . The beam is strong
 . The support is strong

You can construct a strong support by making its base big and heavy. Also make sure the beam is attached securely to the support.

In this example, there is counter weight on one side of the cantilever to help it balance so that it won't tip over.



CHALLENGE Build a cantilever that can support a heavy weight at the end. The beam should be at least 4 inches long. Can you build one where the beam is 10 inches long?

REVIEW:

- What is Bracing?
- How do you make a strong joint?
- What is a strong shape?

LESSON:

Building a Cantilever

What is a Cantilever?

- A beam supported by only one side.
- EXAMPLE- your arm can be used as a cantilever if you stick it straight out.
- EXAMPLE- some balconies and bridges and shelves in your house.

Has anyone ever hung off of a tree branch? That is also a cantilever as the branch is connected only by the main part of the tree.

Hints: a cantilever can be balanced a few ways.

1. Make sure the base is heavy and wide.
2. Add weight to the opposite side to counterbalance the project.
3. Build legs on the base that extend out further than the arm.

Challenge 1 - Individual or Team Build

-Build a Cantilever at least 6" tall that can hold a weight at the end without breaking or falling over.

Challenge 2 - Individual or Team build

- Build a Cantilever at least 8" tall that can hold a weight at the end.

Challenge 3 - Individual or Team build

-Build a cantilever at least 8" tall that can hold 2 weights!

Challenge 4 Ultimate- Individual or Team build

-who can balance the most weight.