

Balanced and unbalanced forces

You are going to investigate balanced and unbalanced forces using the Phet simulation:

[Forces and motion: basics](#)

Open the simulation and click on the 'NET FORCE' tab

Set up the tug-of-war by moving people to each side of the rope.

1. Balanced forces

Set up situations where the people are the same on each side.

Click GO

What happens?

Try for different numbers of people but keep the same on each side.

Complete the table below, record the force values in each direction, the net force and the effect of the motion on the board.

Force to left /N	Force to right /N	Net force /N	Effect on the motion of the board

2. Unbalanced forces

Now try varying the number of people on each side. Click 'GO'.

What happens? Can you explain?

Complete the table below for each situation you set up. Record the forces in each direction, the size and direction of the net force and the effect on the motion of the board.

Force to left /N	Force to right /N	Net force /N	Direction of net force (if there is one).	Effect on the motion of the board

Conclusion

When the forces are balanced, the net force is always _____. The board (does/does not) move.

When the forces are unbalanced, there (is/is not) a net force acting. This causes the board to move in the (same/opposite) direction to the net force.