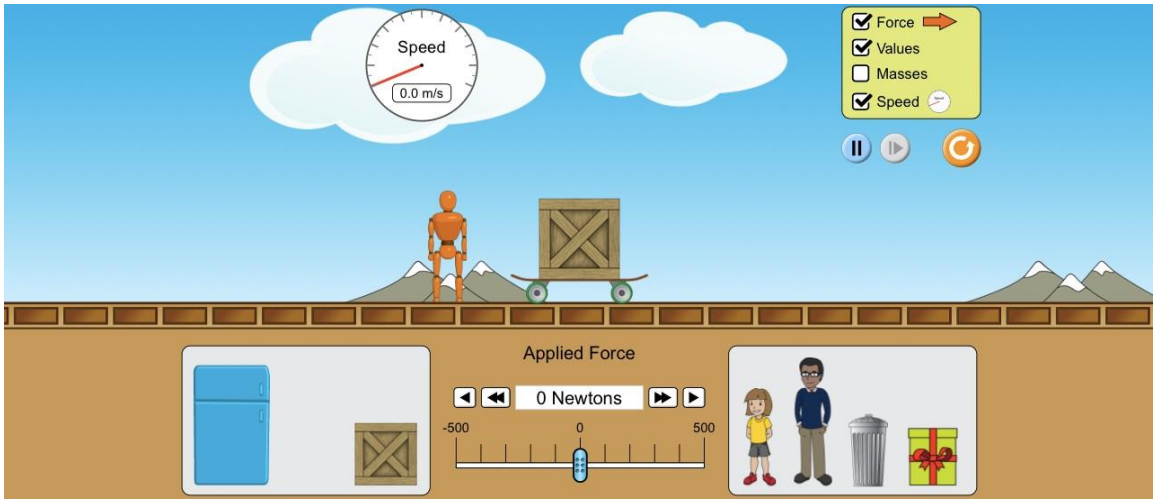
## Forces and Motion simulation

Go to : https://www.physicstutoronline.co.uk/forces-motion-simulation/

**Aim of the activity:**

- To compare the speed changes of objects with different masses when the same force is applied.
- Know what happens to the speed when there is no force applied.
- To compare the speed changes of different forces on the same mass.

Click on the "Motion" tab. Check "Force" "Values" and "Speed" in the yellow box located at the top right corner. This screen appears:




**Note that there is no friction being applied during this simulation.**

1. Using the double-arrow button next to the box, set the force to 100 Newtons.
2. Let the simulation run until the "force", or until the player pushing the box, releases.
3. Answer the following question:

   a. What did you notice about the speed on the speedometer as the player continued to push the box?

   _____

   b. What happened when the player released the force on the box?

   _____

   _____

   c. Try increasing the force to 200N and re-run the simulation. What effect does increasing the force have on the way the speed changes?

   _____

4. Reset the simulation by clicking the orange "Reset" button, and check the boxes for "Force," "Values," and "Speed" again. Remove the box from the board.

5. Make a prediction:

Which object will take the longest amount of time to increase the speed of the board? Circle your answer below:

Refrigerator Small girl Trash can

6. You will complete the table below by placing different objects on the board and exerting a force on it.
After all three trials, rate the time it takes to reach maximum speed.

| Object on Box | Force (N) | Rating (1=fastest, 3=slowest) |
|---|---|---|
| Small Girl | 100 | |
| Trash can | 100 | |
| Refrigerator | 100 | |

7. Click the "Masses" tab in the yellow box. Record the mass of the objects in the table below.

| Object on Box | Force (N) | Mass |
|---|---|---|
| Small Girl | 100 | |
| Trash can | 100 | |
| Refrigerator | 100 | |

8. Analyze:

a. What do you notice about the speed of the forced object and the mass?

_____

_____

b. What rule can you determine about mass and force?

**The greater the mass, the_____the force needed to move it.**