Year 8 Science: Mass, unbalanced forces and balancing a seesaw

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. The same push is given to a 5 kg box and a 20 kg box on the same smooth floor. Which speeds up more?

2. A 300 N force acts 2 m from a pivot. What is its turning effect?

3. A 500 N person sits 1.2 m from a seesaw's pivot. How far from the pivot must a 400 N person sit to balance?

4. On a seesaw, the left side has 800 N m of turning effect and the right side 650 N m. Which way does it tip?

5. Why is it easier to open a door by pushing near the handle than near the hinges?

Fix the mistake

6. Correct this statement: "A seesaw balances when the two people weigh the same."

7. Correct this statement: "Turning effect = force + distance."

8. Correct this statement: "A heavy object needs a force to keep moving at a steady speed but a light one does not."

9. Correct this statement: "Measure the distance from the end of the seesaw."

Answer key (for parents and tutors)

1. The same push is given to a 5 kg box and a 20 kg box on the same smooth floor. Which speeds up more?
   The 5 kg box, because less mass needs less force for the same change.
2. A 300 N force acts 2 m from a pivot. What is its turning effect?
   300 × 2 = 600 N m.
3. A 500 N person sits 1.2 m from a seesaw's pivot. How far from the pivot must a 400 N person sit to balance?
   500 × 1.2 = 600 N m, so 600 ÷ 400 = 1.5 m.
4. On a seesaw, the left side has 800 N m of turning effect and the right side 650 N m. Which way does it tip?
   The left side goes down, because its turning effect is bigger.
5. Why is it easier to open a door by pushing near the handle than near the hinges?
   The handle is further from the pivot (the hinges), so the same force gives a bigger turning effect.
6. Correct this statement: "A seesaw balances when the two people weigh the same."
   It balances when the turning effects are equal, so a heavier person can balance a lighter one by sitting closer to the pivot.
7. Correct this statement: "Turning effect = force + distance."
   Turning effect is force multiplied by distance from the pivot, in N m.
8. Correct this statement: "A heavy object needs a force to keep moving at a steady speed but a light one does not."
   Mass decides how big an unbalanced force is needed to change motion, not whether a steady speed needs a force.
9. Correct this statement: "Measure the distance from the end of the seesaw."
   Always measure from the pivot, because that is the point everything turns around.