

Grade 4

RM 3: Experiment C

Question: Is more force needed to move heavier objects?

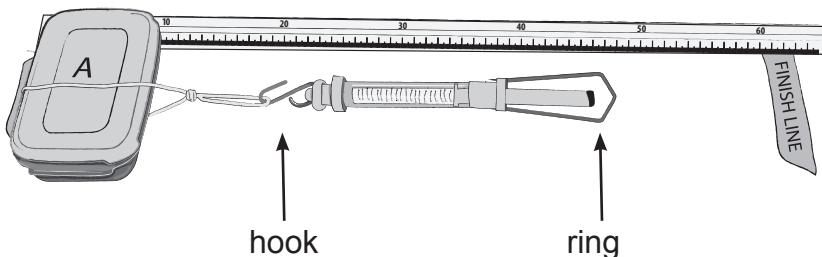
Hypothesis/Prediction: (More/Less) force is needed to move objects with (more/less) mass because _____.

Materials

- empty square or rectangular plastic container, labeled “Container A”
- square or rectangular plastic container filled with gravel, rocks, or dry beans, labeled “Container B”
- string
- meter stick
- push-pull spring scale or pull spring scale, 5 or 10 N, depending on the mass of Container B

Procedure

- Find an open area of floor.
- Place a piece of masking tape on the floor and label it “Starting Line.”
- Use the meter stick to measure 60 cm from the starting line.
- Place another piece of masking tape on the floor 60 cm from the starting line and label it “Finish Line.”
- Tie a string around Container A and make a loop for the spring scale hook.

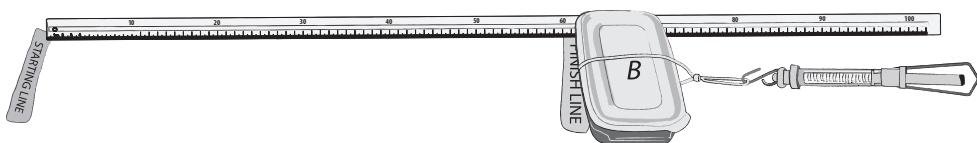


- Place the spring scale hook in the loop of the string.
- Make sure you can see the side of the spring scale showing newtons.
- Place Container A with its back edge resting on the starting line.

Grade 4

RM 3: Experiment C continued

9. Use the spring scale to pull Container A with a steady force until its back edge reaches the finish line.



10. Observe the measurement on the spring scale from the time you begin pulling Container A until the time you stop. You may notice that a greater force is needed to get the container moving.

11. Record the amount of force in newtons that you used to pull Container A.

12. Repeat steps 8–11 two more times.

13. Allow each person in the group to pull Container A three times.

14. Repeat steps 5–13 with Container B.

Data

| Experiment | Amount of Force Used (newtons) | | |
|-------------------------|--------------------------------|---------|---------|
| | Trial 1 | Trial 2 | Trial 3 |
| Pull Container A 60 cm. | | | |
| Pull Container B 60 cm. | | | |

Conclusion

_____ force was needed pull Container (A/B) 60 cm because _____

