

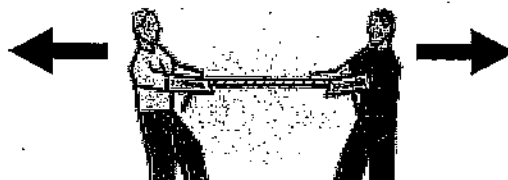
Net Force Challenge #1

Name _____ Date _____ Period _____



1500N 2000N 2500N 1500N 2000N

EXAMPLES



1500 N

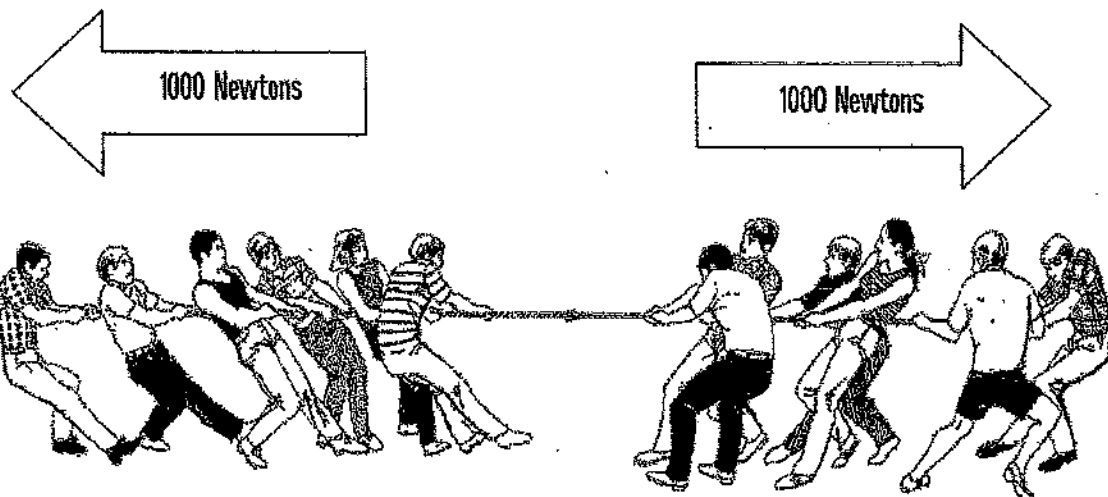
1000 N

PRACTICE PROBLEMS

Find the net force for the given problems.

- a. 10 N \rightarrow and 15 N \rightarrow = _____ N Which direction? _____
- b. 20 N \leftarrow and 60 N \rightarrow = _____ N Which direction? _____
- c. 30 N \rightarrow and 20 N \leftarrow = _____ N Which direction? _____
- d. 40 N \leftarrow and 50 N \leftarrow = _____ N Which direction? _____
- e. 70 N down and 30 N up = _____ N Which direction? _____

Use the following picture to answer the questions. Circle the correct answer in parentheses.




- 1. The forces shown above are (PUSHING / PULLING) forces.
- 2. The forces shown above are (WORKING TOGETHER / OPPOSITE) forces.
- 3. The forces are (EQUAL / NOT EQUAL).
- 4. The forces are (BALANCED / UNBALANCED).
- 5. The net force is (1000 N TO THE RIGHT / 1000 N TO THE LEFT / ZERO).
- 6. There (IS / IS NO) motion.

Name _____ Date _____ Period _____

DETERMINING NET FORCE

Directions: 1. Write the correct net force equation for each picture. 2. Solve, and determine the direction of motion. 3. Determine if the forces are balanced or unbalanced and circle the word.


Example



250 N

Net Force: $300\text{ N} - 250\text{ N} = 50\text{ N}$ →

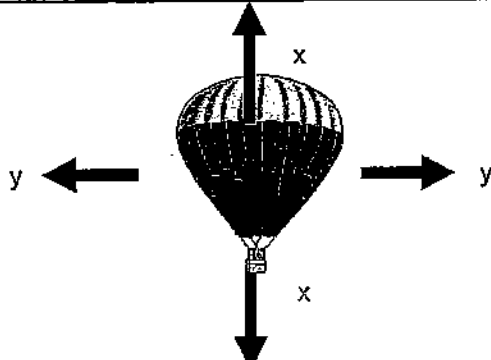
Circle One: Balanced Unbalanced



15,000N 20,000N

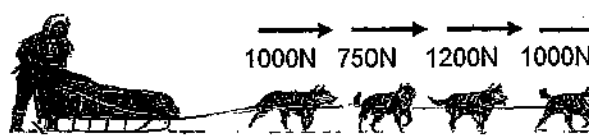
Net Force= _____

Circle One: Balanced or Unbalanced



Circle One: Balanced or Unbalanced

How do you know – what is your evidence?




1000N 750N 1200N 1000N

Net Force= _____

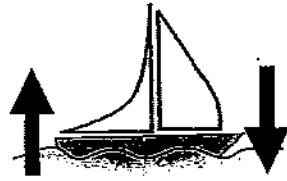
Circle One: Balanced or Unbalanced

5000 N 4500 N 6300 N



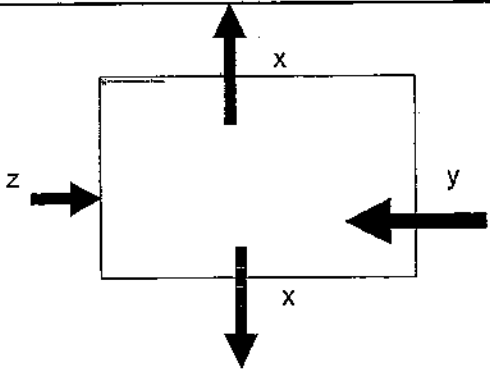
Net Force= _____

Circle One: Balanced or Unbalanced



Circle One: Balanced or Unbalanced

How do you know – what is your evidence?



Circle One: Balanced or Unbalanced

For the plane to be moving forward, what must the relationship between z and y be?

Net Force Challenge #3

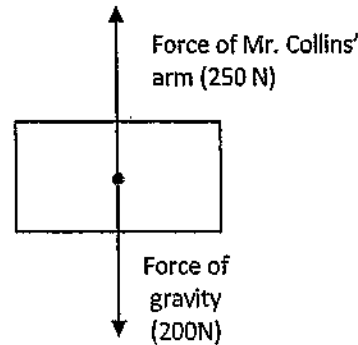
Name: _____ Period: _____ Date: _____

Forces and Free Body Diagrams

Directions: Answer the questions based on your knowledge of forces and friction. For each example problem, calculate the net force on the object described in each situation. Draw a free body diagram for each and show the directions of forces as well as the total net force and direction of net force.

Example: Mr. Collins lifts a heavy box over his head with one push of the arm and a force of 250 newtons. Gravity is pulling down the mass with 200 newtons. What is the net force and direction of the box?

Net force =
50 N
upwards



- 1) What is a force?
- 2) What is meant by *unbalanced forces*, and what is the result? Draw an example:
- 3) What is meant by *balanced forces*, and what is the result? Draw an example:
- 4) A box is being pushed by two stellar science students, one on each side of the box. Jack is pushing the box with a force of 10 N to the left. Sophia is pushing the box with a force of 15 N to the right. Who is the stronger individual and what is the net force and direction on the box?
- 5) During an epic round of Tug-of-War, Adam and Bryan thought they'd be able to beat Mr. Collins no problem. Together, they applied a force of 300 N pulling to the left. But with one arm on the rope and the other at his side, Mr. Collins applied a 300 N force to the right. What is the net force and direction on the rope?

- 6) Mr. Collins finally decided to take this seriously and put both hands on the rope and applied a 500 N force to the left, while Adam and Bryan still struggled with their 300 N force to the right. What is the net force and direction of motion?
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- 7) Alex and Michael were attempting to push Raymond on the scooter with enough force so that Raymond would run into Mr. Collins. They figured out they needed a 50 N force to run the scooter into Mr. Collins. Alex and Michael were both applying force from the left, Alex applying a 20 N force and Michael pushing (mustering all of his strength) with a force of 15 N. Were they able to get Raymond to run into Mr. Collins? How can they get it to hit him?
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- 8) In a 5th period battle, the girls were able to overcome the boys 3 times in the Tug-of-War. Ten boys *each* pulled with a force of 30 N. Ten girls were able to pull the rope toward them with a net force of 50 N. What was the minimum amount of force *each* of the ten girls applied to the rope?
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- 9) During 1st period Emma was a beast. She resisted the forces applied by 13 other students in her class all at once. Her 13 classmates tried to knock Emma over, *each* applying a force of 17 N, and she still didn't budge. How much force was Emma pushing back with, and how many people would it take to push Emma if she can withstand a force of 300 N?
-
- 10) Kevin got fed up and decided to put some of his classmates in a big box. He shoved Emily, Sam, and Skyla into the box and taped it shut. Kevin couldn't overcome the force of friction by himself, so he asked some classmates to help him push the box out the door. The force of friction of the floor on the box was 400 N. If Kevin and his classmates can each shove with a force of 32 N, how many students would it take to make the box start moving out the door?