

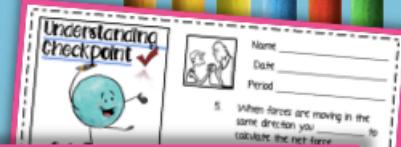
NGSS
Aligned

Black-Eyed Susan Science



Squiggle Sheets

Balanced & Unbalanced Forces



Balanced & Unbalanced Forces



FORCE:
A PUSH OR PULL
ON AN OBJECT

When forces are balanced, there is either:
one motion
OR
constant motion

Balanced forces do NOT cause change in

Net Force is the SUM
OF ALL FORCES ACTING ON AN OBJECT.

Examples:

Balanced

Unbalanced

Moving in opposite directions → SUBTRACT

$$2N - 2N = 0 \text{ Newtons}$$

FORCE:
MEASURED IN
NEWTONS (N)

$$1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2$$

Unbalanced forces can be:

in the same direction
OR

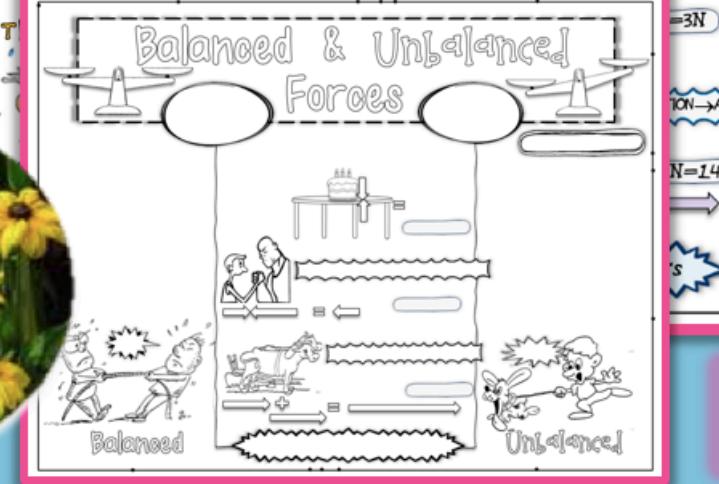
in opposite directions

When forces are unbalanced, there IS a change in motion.

The forces are not equal.

Unequal

Unbalanced



3 Versions!

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Please contact me with any questions, concerns, or comments at
blackeyedsusanscience@gmail.com.

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Balanced & Unbalanced Forces



FORCE:
A PUSH OR PULL
ON AN OBJECT



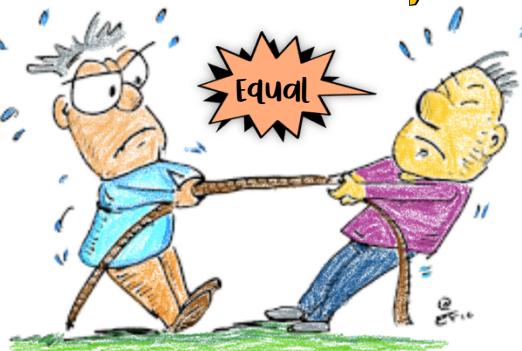
FORCE:
MEASURED IN
NEWTONS (N)

When forces are balanced, there is either:

- no motion
OR
- constant motion

Balanced forces do NOT cause change in motion.

The forces are equal.

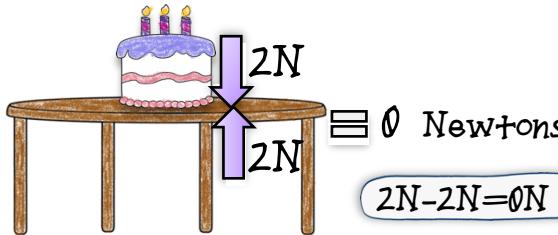


Balanced

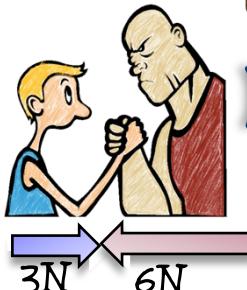
Net Force is the sum of all forces acting on an object.

EXAMPLES:

Balanced



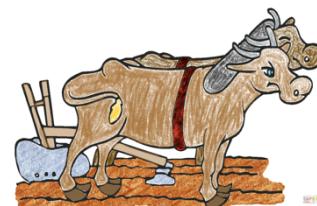
$$2N - 2N = 0N$$



MOVING IN OPPOSITE DIRECTIONS → SUBTRACT

Unbalanced
 $=$
3 Newtons

$$6N - 3N = 3N$$



MOVING IN SAME DIRECTION → ADD

Unbalanced
 $=$

$$6N + 8N = 14N$$

Forces ALWAYS occur in pairs

Unbalanced forces can be:

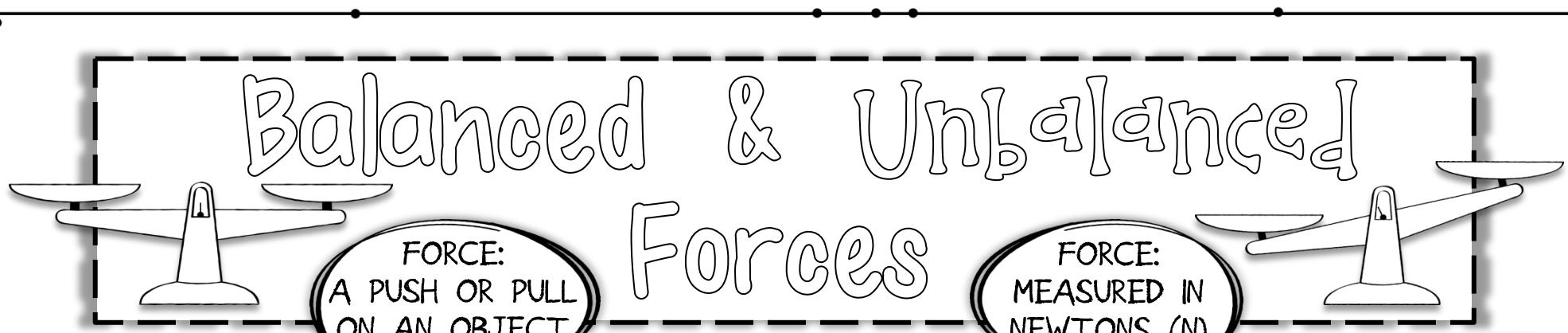
- in the same direction
OR
- in opposite directions

When forces are unbalanced, there IS a change in motion.
The forces are not equal.



Unbalanced

Balanced & Unbalanced Forces



FORCE:
A PUSH OR PULL
ON AN OBJECT

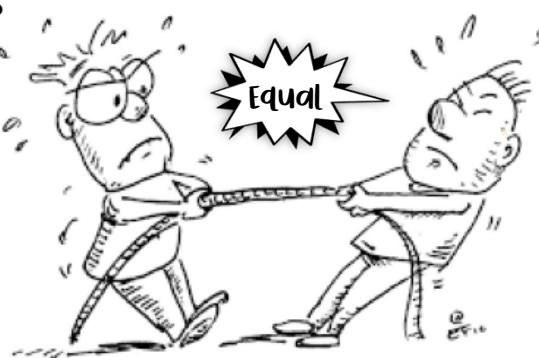
FORCE:
MEASURED IN
NEWTONS (N)

$$1 \text{ N} = 1 \text{ kg} \cdot \text{m/s}^2$$

When forces are balanced, there is either:

- no motion
- OR
- constant motion

Balanced forces do NOT cause change in motion.
The forces are equal.

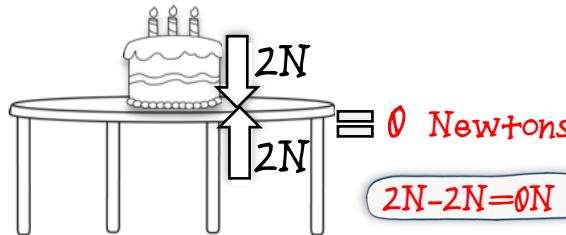


Balanced

Net Force is the **sum** of **All forces** acting on an object.

EXAMPLES:

Balanced



MOVING IN OPPOSITE DIRECTIONS → SUBTRACT

Unbalanced

$$6\text{N} - 3\text{N} = 3\text{N}$$

3 Newtons



MOVING IN SAME DIRECTION → ADD

Unbalanced

$$6\text{N} + 8\text{N} = 14\text{N}$$

14 Newtons

Forces **ALWAYS** occur in pairs

Unbalanced forces can be:

- in the same direction
- OR
- in opposite directions

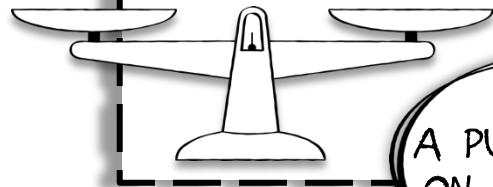
When forces are unbalanced, there **IS** a change in motion.

The forces are **not** equal.

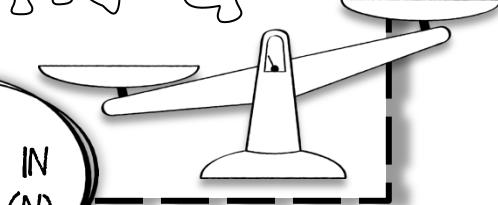


Unbalanced

Balanced & Unbalanced Forces



FORCE:
A PUSH OR PULL
ON AN OBJECT



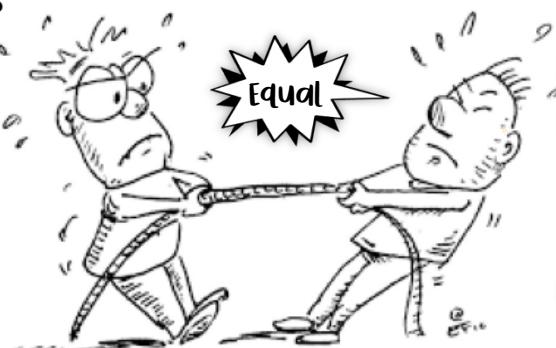
FORCE:
MEASURED IN
NEWTONS (N)

$$= 1 \text{ kg} \cdot \text{m/s}^2$$

When forces are _____, there is either:

- _____
- OR
- _____

Balanced forces _____ cause change in motion.
The forces are _____.

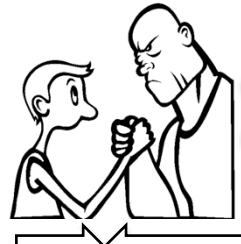
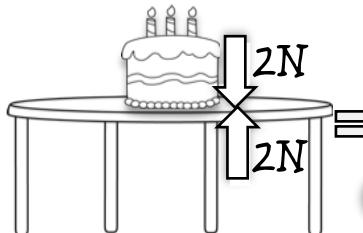


Balanced

Force is the _____ of _____ acting on an object.

EXAMPLES:

Balanced



MOVING IN OPPOSITE DIRECTIONS → SUBTRACT

Unbalanced



3N

6N



MOVING IN SAME DIRECTION → ADD

Unbalanced

6N

$+ 8\text{N}$



Forces

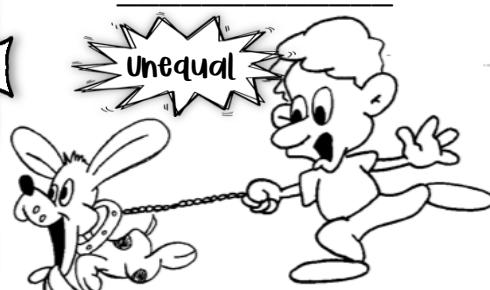
occur in pairs

forces can be:

OR

When forces are unbalanced, _____ a change in motion.

The forces are _____.



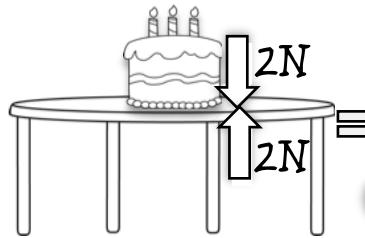
Unbalanced

Balanced & Unbalanced Forces

$$= 1 \text{ kg} \cdot \text{m/s}^2$$

Examples:

Balanced



MOVING IN OPPOSITE DIRECTIONS → SUBTRACT

Unbalanced

3N

6N



MOVING IN SAME DIRECTION → ADD

Unbalanced

6N

8N

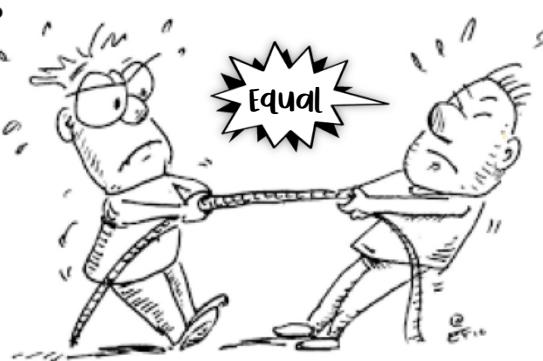


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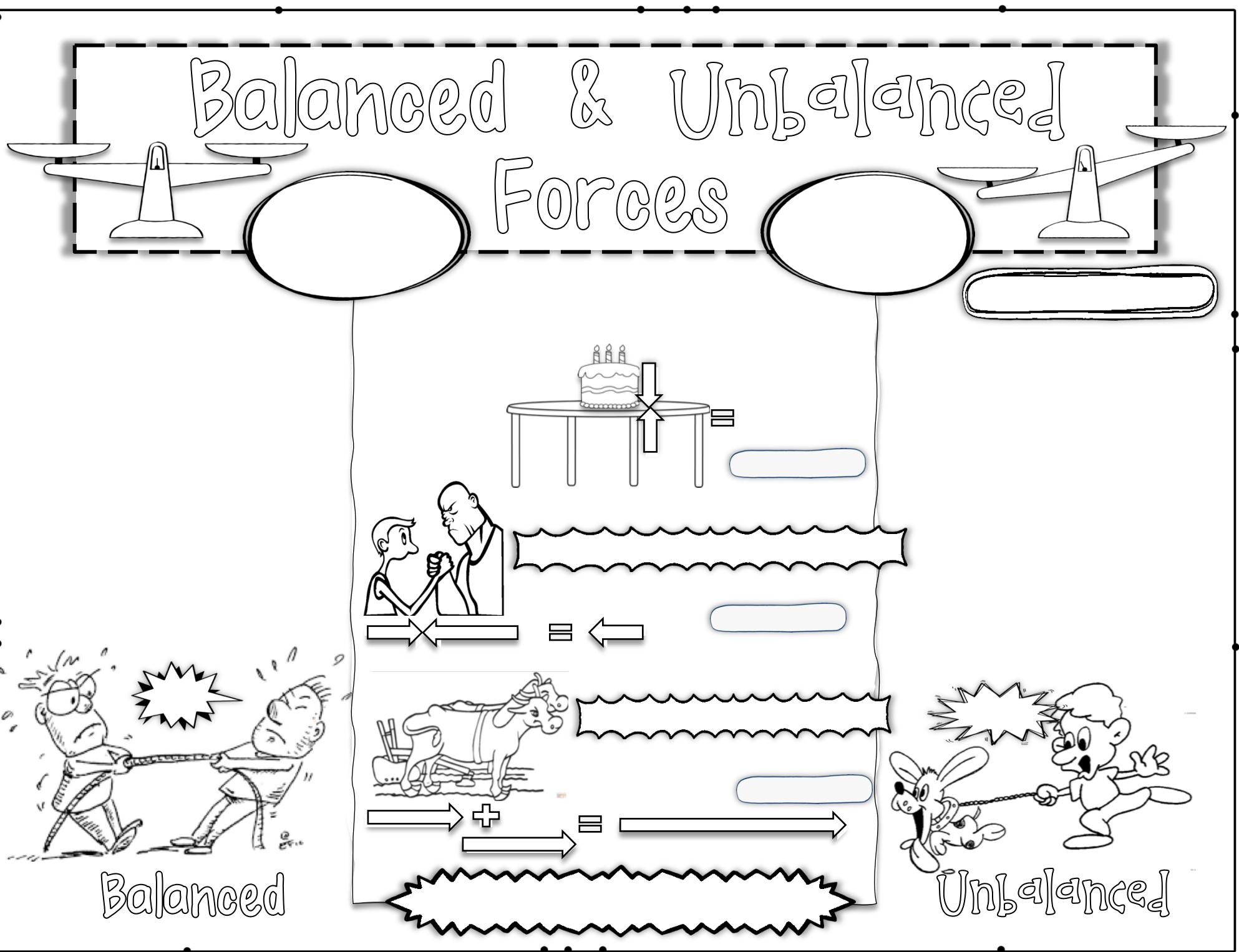


Balanced

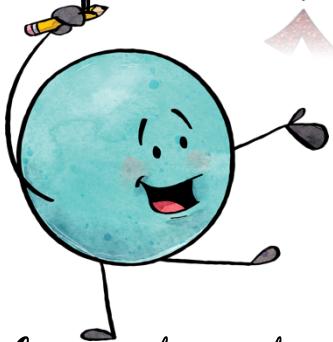
Unbalanced



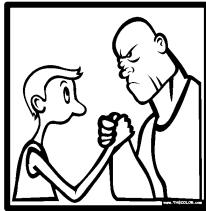
Balanced & Unbalanced Forces



Understanding Checkpoint



Balanced and Unbalanced Forces



Name _____

Date _____

Period _____

1. The net force is the _____ of all forces on an object.
 - a. difference
 - b. sum
 - c. quotient
 - d. product

2. Force is measured in the unit _____.
 a. pounds (lbs)
 b. joules (J)
 c. Newtons (N)
 d. grams (g)

3. When forces are balanced, there is
 - a. no motion.
 - b. constant motion.
 - c. changing motion.
 - d. both a and b.

4. $1 \text{ kg}\cdot\text{m/s}^2 = 1 \text{ _____}$

5. When forces are moving in the same direction you _____ to calculate the net force.
 - a. add
 - b. subtract
 - c. multiply
 - d. divide

6. A force is a _____ or _____ on an object.

7. T or F: Forces usually occur in pairs.

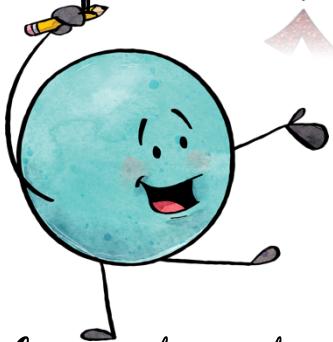
8. T or F: Balanced forces cause a change in motion.

9. T or F: Unbalanced forces can be in the same direction or in opposite directions.

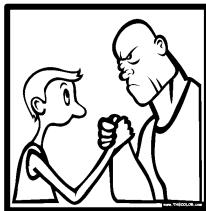
- 10.

$$= \underline{\hspace{2cm}}$$

Understanding Checkpoint



Balanced and Unbalanced Forces



Name _____
Date _____ **KEY**
Period _____

1. The net force is the _____ of all forces on an object.

- a. difference
- b. sum**
- c. quotient
- d. product

2. Force is measured in the unit _____.

- a. pounds (lbs)
- b. joules (J)
- c. Newtons (N)**
- d. grams (g)

3. When forces are balanced, there is

- a. no motion.
- b. constant motion.
- c. changing motion.
- d. both a and b.**

4. $1 \text{ kg}\cdot\text{m/s}^2 = 1 \text{ Newton (N)}$

5. When forces are moving in the same direction you _____ to calculate the net force.

- a. add**
- b. subtract
- c. multiply
- d. divide

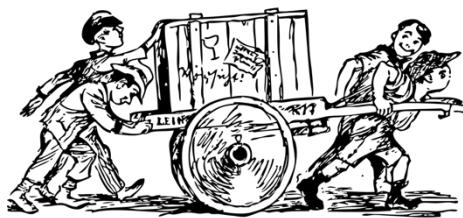
6. A force is a push or pull on an object.

7. **T or F:** Forces usually occur in pairs.

8. **T or F:** Balanced forces cause a change in motion.

9. **T or F:** Unbalanced forces can be in the same direction or in opposite directions.

- 10.



$$= 100 \text{ (N)}$$

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