SCIENCE

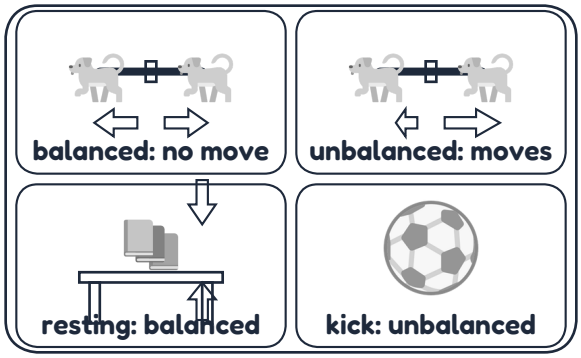
Balanced and unbalanced forces

Name _____ Date _____

I can tell if forces are balanced or unbalanced.

1 How it works

Often more than one force acts on an object. In a tug of war, both teams pull the rope. If they pull with equal strength, the forces are balanced and the rope does not move. If one team pulls harder, the forces are unbalanced and the rope moves toward the stronger team. Unbalanced forces change motion.



2 Balanced or unbalanced? Circle one.


A book resting on a table. balanced unbalanced


A kicked ball flying across a field. balanced unbalanced


Two teams pull, and the rope does not move. balanced unbalanced


A cart speeds up when you push it. balanced unbalanced


A chair sitting still on the floor. balanced unbalanced

How did I do? ☆ ☆ ☆

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Tug of war

Name _____ Date _____

I can predict which way a tug of war will move.

1 Which way will the rope move? Circle it.

Bigger number, stronger pull.



left right no move



left right no move



left right no move



left right no move

2 Fill in the blanks

Use the words in the box.

balanced unbalanced motion stronger

1. Equal forces are _____.
2. Unequal forces are _____.
3. The rope moves toward the _____ team.
4. Balanced forces do not change _____.

How did I do? ☆ ☆ ☆

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Think like a scientist

Name _____ Date _____

I can explain how balanced and unbalanced forces affect motion.

1 Think about it

1. Why doesn't the rope move in a tie? _____
2. What makes a still ball start rolling? _____
3. How could the weaker team win? _____
4. Name something with balanced forces. _____

2 True or false? Circle it.

1. Balanced forces always make things move.	**true**	**false**
2. In a tie, the rope moves fast.	**true**	**false**
3. A soccer kick is an unbalanced force.	**true**	**false**
4. Unbalanced forces can make things speed up.	**true**	**false**
5. A book resting on a table has balanced forces.	**true**	**false**

3 Draw a tug of war that one team is winning. Add arrows.

How did I do? ☆ ☆ ☆

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Try it: push the box

Name _____ Date _____

I can test balanced and unbalanced pushes.

1 You need

-  an empty box
-  a smooth floor
-  a partner
-  a string
-  tape

2 What to do

1. Put the box between you and your partner. Both push gently with the same force.
2. Now one partner pushes harder. What happens?
3. Both stop pushing. Does the box move?
4. Tie the string to the box and try a gentle tug of war.

3 I predict

What will the box do when you both push the same?

_____

_____

4 What I see

Pushes	Did it move?	Balanced or unbalanced?
equal		
one harder		
no push		

How did I do? ☆ ☆ ☆

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FOR TEACHERS AND PARENTS

Answer key: balanced and unbalanced forces

1 Page 1

Forces: 1) balanced; 2) unbalanced; 3) balanced; 4) unbalanced; 5) balanced.

2 Page 2

Tug of war: 1) no move (balanced); 2) left (unbalanced); 3) right (unbalanced); 4) no move (balanced).

Blanks: 1) balanced; 2) unbalanced; 3) stronger; 4) motion.

3 Page 3

Think: 1) The forces are balanced; 2) An unbalanced force, like a kick; 3) Add more people to pull harder; 4) A book on a shelf or a picture on a wall.

True or false: 1) false; 2) false; 3) true; 4) true; 5) true.

Drawing: a bigger arrow on the winning side and the rope moving that way.

4 Page 4: Try it!

When both partners push equally, the box stays still: the forces are balanced. When one partner pushes harder, the box slides toward the weaker side: the forces are unbalanced. With no pushes the box stays still. Only unbalanced forces change motion.

5 Teaching tip

Run a gentle classroom tug of war with a soft rope, first with equal teams and then with uneven ones. Ask children to describe the forces before they say who won.

Safety: push gently, keep fingers clear and use an empty box.

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