

Name: _____

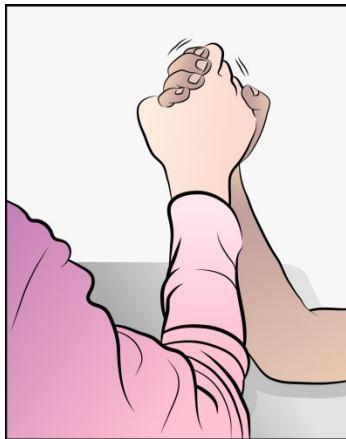
Date: _____

Scenario Cards

Arm Wrestling

Two students are arm wrestling. Both have their elbows on the table and are gripping each other's hands.

At first, the students are evenly matched, and neither of their hands move. Draw **arrows** on the picture below to represent the forces both students are exerting in this arm-wrestling match.



One student pushes the other student's hand to the table and wins the match. Draw **arrows** on the picture below to show the forces both students are exerting in this scenario.



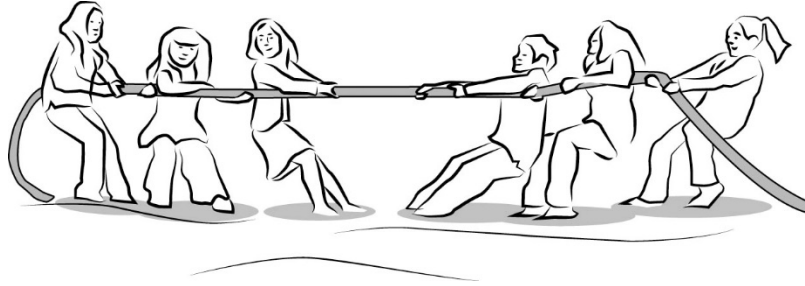
Name: _____

Date: _____

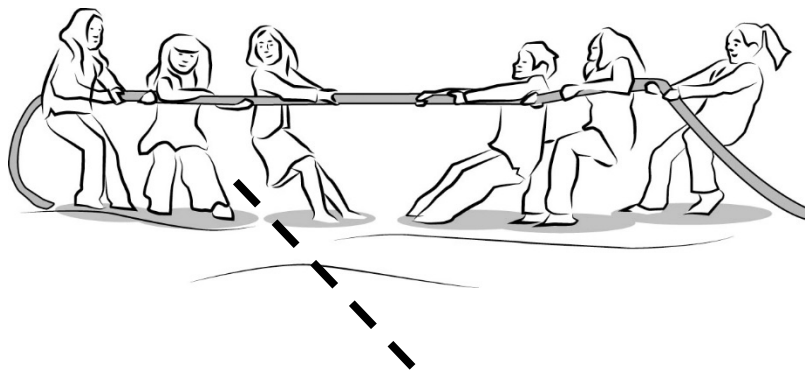
Tug-of-War

At recess, two groups of children are playing tug-of-war.

At first, the two sides pull evenly, and no one moves. Draw **arrows** on the picture below to show the direction and strength of the forces acting on the rope when the two teams are pulling evenly.



After a short time, one team begins to pull harder than the other team. That team wins the tug-of-war when the other team is pulled over the middle dividing line. Draw **arrows** on the picture below to show the direction and strength of the forces acting on the rope when one team pulls harder than the other and wins the tug-of-war.



Name: _____

Date: _____

Shoes on the Ice

Two people are walking across an icy parking lot. One person is wearing boots with soles that look like the tread of a car's tire. The other person is wearing shoes that are very smooth on the bottom. Predict what you think will happen as these two people walk on the ice.

The picture below shows what the soles of the boots look like. Think about what might happen as the person wearing these boots walks on the ice. Draw **arrows** and **bumps** on the picture below to show the direction and strength of the forces involved and what might happen.



The picture below shows what the soles of the other person's shoes look like. Think about what might happen as the person wearing these shoes walks on the ice. Draw **arrows** and **bumps** on the picture below to show the direction and strength of the forces involved and what might happen.



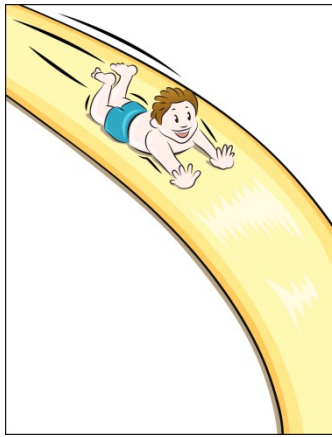
Name: _____

Date: _____

Slip and Slide

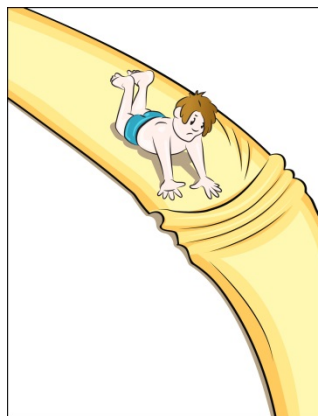
In the summer, you enjoy cooling off in your backyard with a Slip 'N Slide. One day, you turn on the water and glide all the way to the end of the slide.

Draw **arrows** and **bumps** on the picture below to show the direction and strength of the forces involved as you're gliding on the slide. Why are you able to slip and glide so easily when there's water between you and the slide?



On another day, there's no water on the slide, but you try to glide on it anyway. You quickly discover that it doesn't work.

Draw **arrows** and **bumps** on the picture below to show the direction and strength of the forces involved as you're trying to glide on the slide without any water. Why aren't you able to slip and glide when there's no water between you and the slide?



Name: _____

Date: _____

The Ball Drop

One person holds a baseball in the palm of his hand. The ball doesn't move at all. Another person holds the ball in the palm of his hand. When he turns his hand over, the ball drops to the ground. Compare the forces acting on the ball and the resulting motion of the ball in each case.

Draw **arrows** on the picture below to show the direction and strength of the forces acting on the ball resting in the palm of the first person's hand. Why isn't the ball moving?



Now draw **arrows** on the picture below to show the direction and strength of the forces acting on the ball when the second person drops it. Why is the ball moving?

