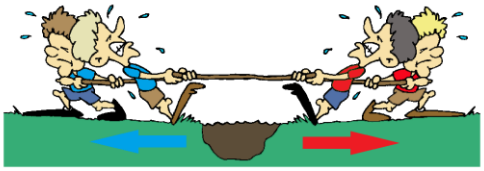
FLL Curriculum - Ontario

Activity Sheet	
Gr 6 - Lesson #3	Move Object – Tug of War
Date:	Name(s):

Check That I'm Done ☑		
☐ Commented on my code	☐ Modify it task	☐ Coding Challenge

Learn	
All forces have two parts, strength, and direction. You can use arrows to draw their direction and make them longer to show that it's stronger.	
Forces that are opposite in direction but are equal in strength will <u>not</u> cause a ***change*** in speed.	
If however you want something to speed up, you must have two forces that are **un**balanced. Thrust and drag are good examples. The thrust from the engines MUST be greater the drag from the air if the airplane is to go faster.	 
After a while, the drag and the thrust become equal and the airplane reaches a constant speed. The plane does not stop moving however.	

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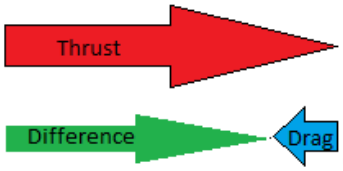
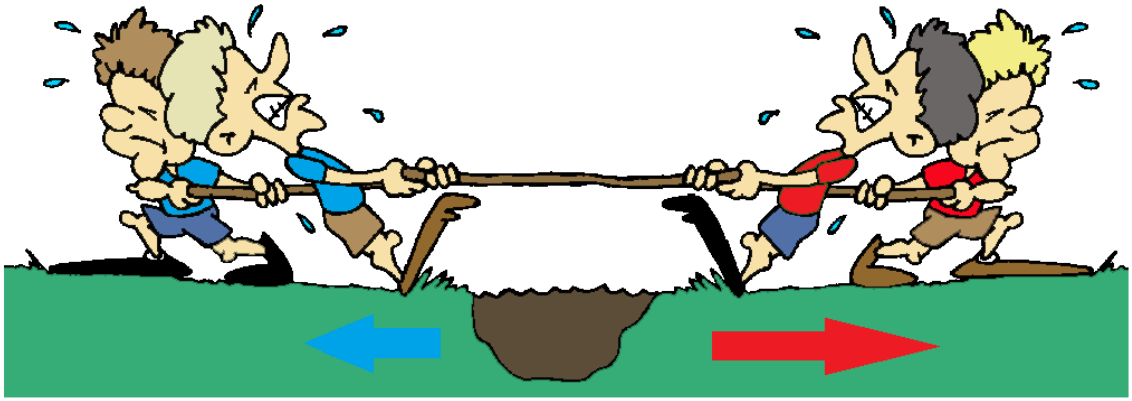
If you add force in one direction, and then subtract the force going the opposite way you can predict which direction it will go (and how quickly).	

Predict and Plan

Which direction will this tug of war go?



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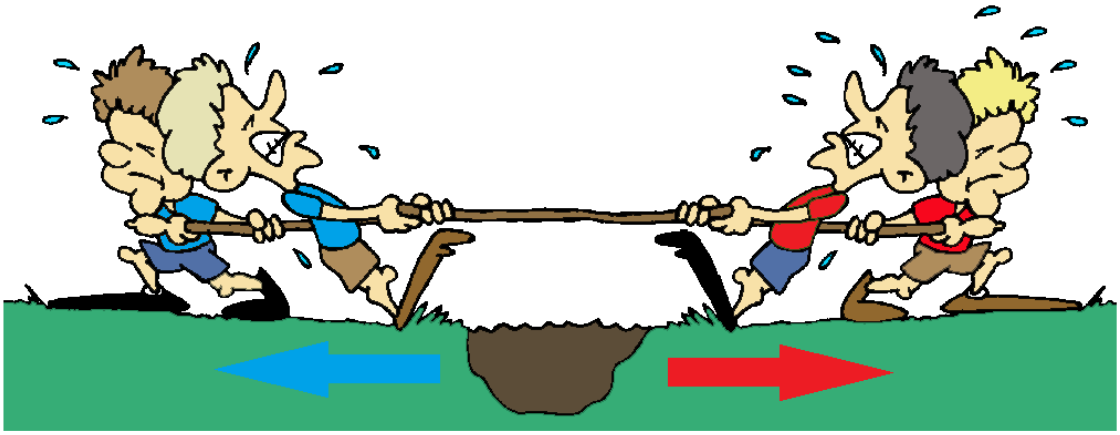
During the competition the red team digs in, and matches the blue teams force, what will happen now? *Hint remember thrust/drag example



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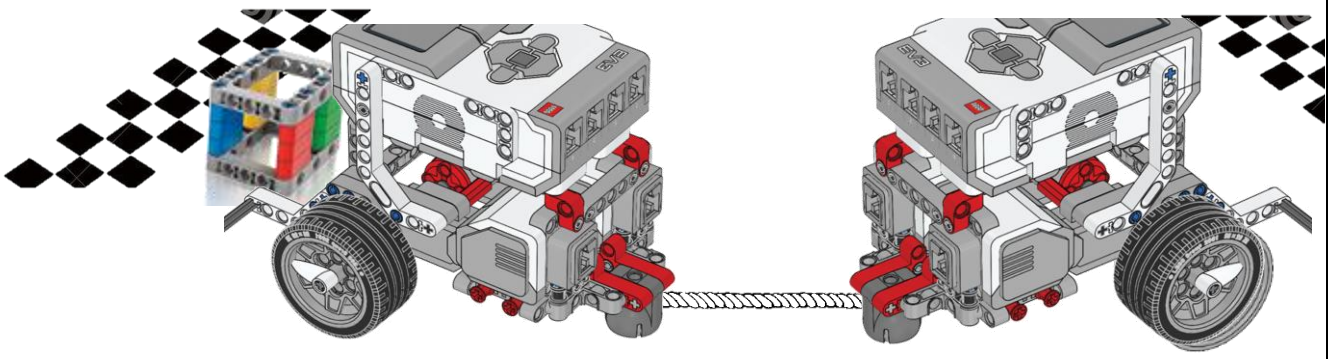
What needs to happen for the tug of way to switch direction?

_____

- Match up against another group.
- Take off the tires (not the whole wheel) of one of robots so it only has its rims.
- Use tape (or string) to connect the robots together by the back.
- Make finish lines about 1 m or so away (depending on space) from where the cuboid starts out.



Demonstrate/Design/Discover

- ✓ The goal is for your robot to bring the cuboid across the finish line
- ✓ Design a program that drives forward and then releases the cuboid at the correct time over the finish line. Assume your robot is the one with the tires on (as you will take turns). This will take some experimenting.
- ✓ You are going to be testing your program by competing in several ways with another group. First make predictions as to which robot you think will win. Take turns being the 'gripbot' and the 'slipbot'.

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Tips: Remember that if you control your motors using seconds, greater power results in greater distance. However if you use rotations, the power does not affect the distance it travels.

Record			
First with a √ predict who will win then Circle the Winner			
Trial	**Robot A**	**Robot B**	**Force Arrows***
1	Grip Bot 100% Power	Grip Bot 100% Power	
2	Grip Bot 100% Power	Grip Bot 50% Power	
3	Slip Bot 100% Power	Grip Bot 100% Power	
4	Slip Bot 100% Power	Grip Bot 40% Power	
5	Slip Bot 100% Power	Grip Bot 5% Power	
6	Slip Bot 0% Power	Grip Bot 5% Power	

*Draw your force arrows based on the results you see in your tests (the first two are done for you)

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