

Robot Races Lesson Plan

Lesson Goals:

- Introduce and remind 6th grade students of positive and negative integers.
- Numeric representation of “backwards” and “forwards” as positive and negative values.
- Extract the concept of the “Commutative Property” where order doesn’t matter. In this case, the commutative property of addition, but also the commutative property of multiplication.
- Teamwork skills, communication skills, shared responsibility/accountability.
- Data collection and data checking.
- For JSAA, required to introduce students to space foundation technology and NXT robots.

Supplies:

- Flashcard sets with matching values
- Robot Races Record Sheet (1 per team)
- Number Line Worksheet (1 per team)
- Number Lines
- Robots or Number Line Markers
- Pencils/Erasers

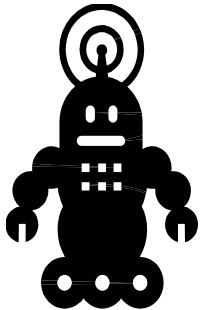
Lesson Schedule:

1. All robots/markers start at zero. Review positive/negative sides of the number line. Go over what that means in terms of “backwards” and “forwards” if using programmable robots.
2. Hand out a set of flashcards, in order to each team
3. Explain Record Sheet and Job descriptions while calculating the first two or three card values together.
4. Have students complete the first round. Compare their final destination on the number lines and their final answer on their record sheet. Discuss similarities and differences. All teams had the same cards, in the same order so they should have ended up at the same place.
5. Have teams mix up their cards and race again. Compare final destination and final answer.
6. Repeat race for a third and/or fourth time, each time having students hypothesize about what the outcome should be.

Extensions/Modifications:

- Fractions/Decimals/Multiples
- Algebraic Expressions
- Visualization of a budget or bank account
- Comparing and Ordering values (whole/fraction/decimal)
- Computation Review/Quiz with questions of different values
 - Hard questions worth more points
 - Easy questions worth few points

ROBOT RACES - JOB TITLES



PILOT:

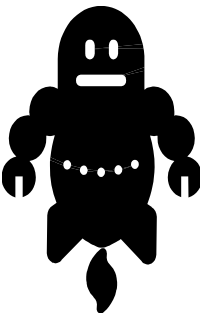
This person is responsible for operating the computer software which, in turn, controls the movements of the robot. The Pilot takes his or her directions from the Navigator.

Round 1:

Round 2:

Round 3:

Round 4:



NAVIGATOR:

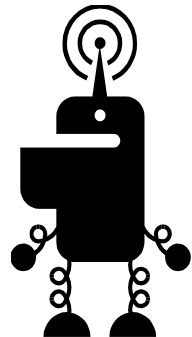
This person is responsible for ensuring the robot's position on the number line is correct. The Navigator works with the Records Officers to calculate and verify the robots next move. Once in agreement, the Navigator then tells the Pilot which direction and how many spaces to move the robot.

Round 1:

Round 2:

Round 3:

Round 4:



RECORDS OFFICER(S):

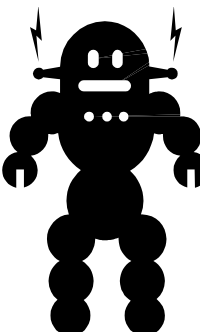
The Records Officer or Officers are responsible for documenting each card value and each move of the robot. The Records Officers act as "Quality Assurance", checking each other's work, and the work of the Navigator to avoid any errors.

Round 1:

Round 2:

Round 3:

Round 4:



GROUND CREW:

There are two Ground Crew personnel; One stands on the number line marking the robot's starting point, the other marks its destination or end point. The Ground Crew work with and follow the directions of the Records Officers and Navigator.

Round 1:

Round 2:

Round 3:

Round 4:

Names: _____

Date: _____

ROBOT RACES RECORD SHEET

ROUND 1		
	Card Value	Destination
Starting Point		
Card 1		
Card 2		
Card 3		
Card 4		
Card 5		
Card 6		
Card 7		
Card 8		
Card 9		
Card 10		
Card 11		
Card 12		
Ending Point		
Observations: _____		

ROUND 2		
	Card Value	Destination
Starting Point		
Card 1		
Card 2		
Card 3		
Card 4		
Card 5		
Card 6		
Card 7		
Card 8		
Card 9		
Card 10		
Card 11		
Card 12		
Ending Point		
Observations: _____		

ROUND 3		
	Card Value	Destination
Starting Point		
Card 1		
Card 2		
Card 3		
Card 4		
Card 5		
Card 6		
Card 7		
Card 8		
Card 9		
Card 10		
Card 11		
Card 12		
Ending Point		
Observations: _____		

ROUND 4		
	Card Value	Destination
Starting Point		
Card 1		
Card 2		
Card 3		
Card 4		
Card 5		
Card 6		
Card 7		
Card 8		
Card 9		
Card 10		
Card 11		
Card 12		
Ending Point		
Observations: _____		

