

Little Read 2013: *Rules* by Cynthia Lord

<b>Title:</b> Wheels And Motion
<b>Content Area:</b> Science / Friction
<b>NC SCOS or Common Core Objective(s):</b> 5.P. 1 Understand force, motion and the relationship between them. 5.P.1.1 Explain how factors such as gravity, friction, and change in mass affect the motion of objects. 5.P.1.2 Infer the motion of objects in terms of how far they travel in a certain amount of time and the direction in which they travel. 5.P.1.3 Illustrate the motion of an object using a graph to show a change in position over a period of time. 5.P.1.4 Predict the effect of a given force or a change in mass on the motion of an object.
<b>Rationale/Relationship to Text: pages 119-123 148-149</b> Catherine pushed Jason in a wheelchair in the parking lot. Wheelchairs are moved by force of motion. The friction of the wheels of Jason's wheelchair against the pavement inhibited the speed at which Catherine could travel. This exercise demonstrates to students the amount of force/energy needed to move Jason through the parking lot.
<b>Instructions/Procedures:</b>  <b>Instructions:</b> Have a group discussion about the outcomes the students feel will come of each activity: alone, with wheeled mechanism, with person & wheeled mechanism, etc. Have students write down their predictions.  Mark off distances you want students to run (2 or more) and have the students measure each of the distances. Have at least one ramp for use in the experiment (if using multiple ramps have varying angles). Have students predict how long it will take for them to run each distance alone, up a ramp, down a ramp, with a wheeled mechanism, pushing/pulling someone on a wheeled mechanism, and with others assisting them pushing/pulling someone on a wheeled mechanism. Have students time each other running the different distances and ramps used for the experiment. Have them record their times. Then have students run with the method of a wheeled mechanism you will be using for the experiment without anyone on it. Record those times. Repeat the experiment with different students on the wheeled mechanism and record the times for that experiment.

You can continue to alter the experiment with different distances, times, adding ramps of different inclines, and number of students involved in pulling/pushing the wheeled mechanism.

**Procedures:**

- prediction activity (distance over time)
- students fill in chart at the end of the lesson to document the distances of the experiment and time it took for each portion of the experiment
- students push/pull each other on wheeled mechanism with varying start distances
- one student pulling vs two students pulling (what is the effect on time and distance)
- running up/down a ramp
- time the total movement
- measure the distance
- graph results
- draw conclusions

**Materials:**

rolling chairs or boards or wheelchair  
 stopwatch  
 graph to fill in (below)

**References:**

Lord, C. (2006). *Rules*. New York: Scholastic

	- _____ in/ ft	_____ in/ ft	_____ in/ ft
Running alone on level			

ground			
Running alone up a handicap ramp			
Running alone down a handicap ramp			
Running with empty wheeled mechanism on level ground			
Running with empty wheeled mechanism up a ramp			
Running with empty wheeled mechanism down a ramp			
Running with person on wheeled mechanism on level ground			
Running with person on wheeled mechanism up ramp			
Running with person on wheeled mechanism down ramp			
Running with person on wheeled mechanism on level ground with assistance			
Running with person on wheeled mechanism up ramp with assistance			
Running with person on wheeled mechanism down ramp with assistance			