Balls & Ramps Performance Task **Grade Cluster 1/2**
S :2 (Inquiry – Predicting); S :4 (Inquiry – Conduct Experiment); S :7 (Inquiry – Explain Data); S :19 (Physical Science—Motion); S :21 (Physical Science—Force)

Scenario: *"Let's imagine"* ***Sarah and Tim have spent the whole morning in the block corner of their classroom. They have been building roads with blocks, books and ramps. They decide to build a downhill road, and test two cars to see which one is faster.***

Problem: ***How can a fair test show which car travels faster on a downhill road?***

Prediction: ***What is your prediction about which car is faster on the downhill roadway? Explain your thinking.***

	Getting Started	Almost There	Got It	Wow!
Prediction	Predicts. Gives no reason	Predicts, Gives reasons based on non-scientific information	Predicts and gives reason based on prior knowledge or reasoning.	… and generalizes predictions

Investigation: Create a fair test to see which car is faster on the downhill roadway.

Materials*: small cars, blocks (and/or books), ramps of different surfaces, tape/string, chalk*

	Getting Started	Almost There	Got It	Wow!
Roadway Set Up	Roadway does not meet criteria for test i.e. it is level or cars won't fit on it.	Road is inclined, but configuration does not support test design.	Road way is inclined and matches student's test design.	
Method of determining the fast car/winner	Selects fast car based on non-scientific criteria	Determines method, but is unable to	Determines method and can explain it.	Explains method and suggests alternative(s).

		explain it.		

Name: _____ Date: _____

Data Collection:.

Draw a picture of your downhill roadway and speed test. Label your drawing

	Getting Started	Almost There	Got It	Wow!
Representation	Drawing includes one test feature, no labeling.	Drawing includes two test features, one label	Drawing includes three test features, and two labels	Drawing to scale Labels 3 or more test features

4***. What new questions do you have about how cars move on downhill roads?***

Analyzing and Using Results:

1. Did your experiment support your prediction? Explain your thinking.

	Getting Started	Almost There	Got It!	Wow!
Relates experiment to prediction	Inappropriately revises or supports prediction.	Correctly revises or supports prediction	Uses scientific evidence to supporting or revising prediction	... and generates new questions

2. What things were done to make this a fair test?

	Getting Started	Almost There	Got It!	Wow!
Fair Test:	Does not control elements surface incline release technique repeat trials other:	Controls 1 variable surface incline release technique repeat trials other:	Controls 2 variables surface incline release technique repeat trials other:	Controls 3 or more variables surface incline release technique repeat trials other:

3. Can you tell about some of the forces that caused this car to win the race?
(What does it take to get the car to win the race?…)

	Getting Started	Almost There	Got It!	Wow!
Science Content: Forces	Does not identify a force involved in test. gravity friction weight	Motion is caused by a push or a pull gravity friction weight	Size of change of motion is related to the strength of the push or pull. gravity friction weight	Describes more than one force acting on the cars. gravity friction weight

	other:	other:	other:	other:

Notes: Appropriate use of terms or descriptions:

gravity: (may sound like: invisible pull towards the earth

areodynamics (ie. shaped to slice through the air)

friction: (force that opposes motion/slows things down, wheels rub against the road, push through the air

weight: (the amount of gravity an obect has

momentum (the heavier the car and faster it is going, more momentum it has

potential energy (the stored energy given to the car when you lift it off the ground

kinetic energy (the energy of motion when the car is released at the top