Grade Level: 5th

Unit: Lesson: Force and Motion - Friction/Surface Texture

Concept: What effect does Surface Texture have on distance a car will travel

Standards:

Materials needed:

Hot Wheels metal 10 per class - identical cars 6 sets of 10 cars

Kinects to build 60 cars.

60 wedges (door stop wedge)

small black wheels

sand paper

felt

tin foil

ramps (5’) 10 per class (6 classes) (hot wheel track preferred)

small magnets to attach weight to cars (30 per class)

Lesson:

<http://www.nclack.k12.or.us/cms/lib6/OR01000992/Centricity/Domain/98/force%20and%20motion%20science%20notebook%20grade%205.pdf>

Purpose of the revision:

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| --- | --- |
| Lesson refinements to observe**Effective Science Instruction**:* Elicit students’ initial ideas
* Engage students intellectually with important science content
* Provide opportunities for students to confront their ideas with evidence
* Help students formulate new ideas based on that evidence
* Encourage students to reflect upon how their ideas have evolved
 | Lesson refinements to observe selected **Student Learning Traits**:1. All students engage intellectually in

important science content.1. All students participate in

science discourse with peers(equitable, accountable talk).1. All students use evidence to demonstrate conceptual understanding.
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Target:

Learning outcome: Students will be able to use the engineering process to design a car that travels an optimum distance.

Sequence/Progression:

Day 1 - Introduce Engineering Process

 - design a system where a car travels the optimum distance

Day 2 - What effect does surface texture have on the distance the car will travel -Friction

Day 3 - What effect does ramp height have on the distance the car will travel - Gravity

Day 4 - What effect does the weight have on the distance the car will travel - Mass

Day 5 - Fishbowl discussion on data from the expert groups (friction, mass, gravity)

Day 6- Engineering Lesson:Use data from experiments to design a system for a car that travels the distance. (optimization)

Day 6 - Reflection of learning -

Prompts:

Fishbowl Questions:
 What affect did friction have on the distance your car traveled?

 What affect did gravity have on the distance your car traveled?

 What affect did mass have on the distance your car traveled?

 \*Could look like a gallery walk to different groups’ “labs”

 \*Extension questions- what would you do to make your car travel farthest?

 travel only a certain distance?