

LEGO My Egg-O!

Major Topic and SOL	Simple Machines
Science SOL	3.1 a, b, c, d, e
Math SOL	3.16, 3.17 a, b, c, 3.18, 3.19
C/T	3-5.5, 3-5.6, 3-5.7

Length of Unit Two Class Periods

Major Understanding

- Decide what type of simple machine will be used in making egg protecting LEGO Car.
- Understand how simple machines function.
- Explain how simple or compound machines are used in everyday life and how they can be used for safety.

Essential Questions

- How does the design of the Lego Car affect the safety of the egg?
- How does the design of an object in everyday life affect the performance?
- How can changes be made in the design to better protect the egg?

Student Objectives

The student will

- Predict and observe if the cars using simple machines and the safety restraints they made were effective.
- Answer questions that are developed to formulate the groups hypothesis
- Chart and plot data on graph on Smartboard from Go Motion.
- Decide what types of simple machines will best help to create LEGO car and safety restraint.
- Explain how simple machines function to help make our lives easier and safer.
- Explain how compound machines also work to make our lives easier and safer.
- Design and use examples of simple and compound machines found in the school, home, and work environment.

Bloom's Taxonomy Skills

- Creating, evaluating, analyzing, applying, understanding, remembering

Assessment Evidence

Performance Tasks

- In groups of 3 students will design a LEGO egg car on paper

- Create the car using LEGOS that will have a safety restraint that will protect an egg (comparing it to cars and seatbelts)
- List simple machines used in creating the car.
- Graph the speed using data from Go Motion

Other Evidence

- Model of LEGO Car
- Cooperative Learning Group Rubric
- Egg – Cracked or safe?
- Go! Motion data plotted on Interactive White Board

Technology

- Hardware: Computer, Flip camera, digital camera, Interactive white board, Go! Motion probeware
- Software: Internet Explorer, Logger Lite

Internet Resources

- Watch example videos of LEGO cars made to help students understand what is expected of them. Watch a seat belt commercial that uses eggs as an example.

Supplies/Materials

- LEGOS, tape, bubble wrap, GO Motion, computer, Smartboard
- Cooperative Learning Rubric, Go! Motion Rubric

5E Lesson Plan

Engage: Show students' video example of LEGO cars being made and crashed. Show students video of seatbelt crash test using eggs. Students will be given the task to design a LEGO car that will protect their egg as it crashes at the bottom of a ramp.

Explore: Students will explore different safety designs while planning with cooperative learning group. They will also explore the types of simple machines they want to use to create the car. Students will design a plan for their car and use the checklist to make sure they have incorporated the necessary design components.

Explain: Students will explain how their safety restraints will work to keep the egg safe. They will also explain the simple machines used to make the car and safety restraint.

Elaborate: Students will run the cars down a ramp crashing into a door or wall to see if they have built a safety restraint strong enough to protect their groups' egg. They will also record the speed of the LEGO car using Go Motion.

Evaluate: Students will use a cooperative learning rubric, simple machines list and plot the Go Motion data on the interactive white board. They will compare their results with the rest of the class and determine how they would re-design their car for better performance next time.

Simple Machines Checklist for LEGO Egg Car Project

Directions: Place a checkmark in the box of the simple machine you used in your car. Explain how or where it was used.

- Inclined Plane – A plane that has one end higher than the other.

Did you use this in your car? Explain how: _____

- Wedge – Two inclined planes that come to a point to make lifting or splitting easier.

Did you use this in your car? Explain how: _____

- Screw – An inclined plane wrapped around a pole.

Did you use this in your car? Explain how: _____

- Lever – A bar that pivots around a fulcrum.

Did you use this in your car? Explain how: _____

- Wheel and Axle – A wheel with an axle through its center to move loads.

Did you use this in your car? Explain how: _____

- Pulley – A wheel with a groove for a rope that is used for lifting.

Did you use this in your car? Explain how: _____

Building a Structure: LEGO Egg Car/Simple Machines

Student(s): _____

CATEGORY	4	3	2	1
Plan	Plan is neat with clear ideas and labeling for all simple machines involved in car and safety for egg.	Plan is neat with clear ideas and labeling for all simple machines involved in car and safety for egg.	Plan provides clear ideas and labeling for all simple machines involved in car and safety for egg.	Plan does not show ideas clearly and is not labeled with simple machines used and safety for egg is not met.
Construction - Materials	Appropriate materials were selected and creatively modified in ways that made them even better.	Appropriate materials were selected and there was an attempt at creative modification to make them even better.	Appropriate materials were selected.	Inappropriate materials were selected and contributed to a product that performed poorly.
Function	LEGO car functions extraordinarily well, holding up under typical stresses. Egg did not crack.	LEGO car functions well, holding up under typical stresses. Egg did not crack	LEGO car functions pretty well, but deteriorates under typical stresses. Egg cracked.	Fatal flaws in LEGO car with complete failure under typical stresses. Egg cracked.

Rubric Made Using: **RubiStar** (<http://rubistar.4teachers.org>)