

## Corroplast Cars 3<sup>rd</sup> Grade

### Standards

#### Physical Science

**Benchmark C:** Describe the forces that directly affect objects and their motion

**Indicator 2:** Describe an object's motion by tracing and measuring its position over time.

**Indicator 4:** Predict the changes when an object experiences a force (e.g., push or pull, weight and friction).

#### Science and Technology

**Benchmark B:** Describe and illustrate the design process.

**Indicator 1:** Use a simple design process to solve a problem (e.g., identify a problem, identify possible solutions and design a solution).

#### Scientific Inquiry

**Benchmark A:** Use appropriate instruments safely to observe, measure, and collect data when conducting an scientific investigation.

**Indicator 1:** Select the appropriate tools and use relevant safety procedures to measure and record length and weight in metric and English units.

**Indicator 2:** Discuss observations and measurements made by other people.

**Benchmark B:** Organize and evaluate observations, measurements and other data to formulate inferences and conclusions.

**Indicator 3:** Read and interpret simple tables and graphs produced by self/others.

**Benchmark C:** Develop, design, and safely conduct scientific investigations and communicate the results.

**Indicator 5:** Record and organize observations (e.g., journals, charts, and tables).

**Indicator 6:** Communicate scientific findings to others through a variety of methods (e.g., pictures, written, oral and recorded observations).

### Summary

Students will change one variable at a time (wheel size or weight distribution) in a plastic car design to study the effect it has on the distance the car rolls down a ramp. They will record their results, report their findings to others, and compare their findings to others in the class.

### Overview

Students doing this experiment will learn of the importance of discovering the effect of changing one variable at a time in a design. They will also explore the effect gravity has on different factors, such as tire size and weight distribution.

### **Pre-Assessment**

Demonstrate the plastic car going down the ramp with small tires. Ask them what force is acting on the car. (Gravity). Ask them if we can change the way gravity acts on the car to make the car go faster. Have them make suggestions as to how to do that, keeping the car body the same.

Have them predict what effect changing the size of the tires would have on the distance the car travels. Have them state their prediction in a sentence on their reflection sheet, below.

Have them predict what effect changing the weight on the car would have on the distance the car travels. Have them state their prediction in a sentence on their reflection sheet, below.

### **Post-Assessment**

Have students record the results of their experiments in a chart. Have them present their results and tell if their predictions were true. Students can compare results of others to draw conclusions about tire size, weight, and the effect on the distance the cars traveled.

Assess the students' work for controlling the variable in the experiment, accurate recordings, neatness and clarity in presenting data, and drawing logical conclusions from studying the data.

### **Instructional Procedures**

#### **Day 1**

1. Complete the pre-assessment.
2. Have students work in groups. Have them test their car with no weight and four small tires. Have them record their car's distance in their chart, using a vertical bar graph.
3. Have students make their first change (either tires or weight) and predict how the change will affect the distance the car travels. Have them record their prediction first, then test the change and record the results on their chart.
4. Have the groups make their second change to their car (tire size or weight), write down their prediction, and test the car again. They are to record their prediction and record their results on their chart.

#### **Day 2**

1. Have the students transfer their bar graphs to a classroom sized chart. Have students explain their results and tell if any of their predictions held true.
2. Ask them to draw some conclusions from all the class data about what made the cars go the farthest. Ask them to explain why they think that happened.



## Corroplast Cars

First run:

Tire size: \_\_\_\_\_ Extra Weight? Y or N

Position of Weight: F M B Distance (in) \_\_\_\_\_

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Second run: Prediction (farther or shorter than first run)

Tire size: \_\_\_\_\_ Extra Weight? Y or N

Position of Weight: F M B Distance (in) \_\_\_\_\_

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Third run: Prediction (farther or shorter than second run)

Tire size: \_\_\_\_\_ Extra Weight? Y or N

Position of Weight: F M B Distance (in) \_\_\_\_\_

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**$\bar{D} \pm 0.05 \bar{D}$   
(in)**


**trial 1**

**trial 2**

**trial 3**

# Corroplast Assessment

Names: \_\_\_\_\_

<b>Criteria</b>	<b>3 = excellent 2 = good 1 = poor 0 = N/A</b>	<b>Comments</b>
Student limited changes in experiment to 1 variable at a time		
Student completed data sheet accurately		
Student displayed data neatly and accurately in graph		
Student made logical conclusions from collected data		