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Lesson Title:

Wind Tunnel Aerodynamics

Subject Area:

Industrial Technology

Grade Level:

9-12

Lesson Summary:

Aerodynamics is the study of the behavior of moving air and the forces that it produces as objects move through it. Aerodynamics is a very complicated subject and many years of research have gone into studying air in motion. Aerodynamics is a complex science that uses complicated mathematical equations to describe the behavior of air in motion, we will provide tasks that will attempt to describe the components of aerodynamics in an understandable form.

## Objective/Content Standard/Benchmark:

? Students will gain an understanding of basic Aerodynamic principles ? Students will learn how aerodynamic principles affect CO2 race car performance ? Students will apply aerodynamic principles to CO2 race car design ? Students will compare various CO2 race car wind tunnel tests

## Approximate Time Needed:

5 days

## Prerequisite Skills:

? Basic computer literacy, including internet use ? Basic woodworking machinery skills

## Materials and Resources Required:

### Technology:

? Computer system /computer with internet preferred ? Power point Presentation ? Encarta ? Spread sheet ? Floppy disks for saving student data

### Printed Materials:

? Prepared worksheets for recording student data results ? Vocabulary worksheet

### Supplies:

CO2 car blank or completed CO2 car

### Others:

? Wind tunnel ? Wood working tools

## Procedures:

Watch Power Point Presentation or follow the procedures below Procedures: 1. Fill out aerodynamics vocabulary worksheet: using Encarta, dictionary, and Internet web sites 2. Perform wind tunnel test and record original data on worksheet 3. Prepare collected data results with graphs showing individual performance 4. Compare results with classmates 5. Repeat steps 2,3,and 4 until desired aerodynamic drag results occur 6. Class discussion of test results, and what have students learned about aerodynamics as a result of this lesson

## Modifications for Differentiated Instruction:

### For the special needs student:

? Assign a peer tutor ? Provide additional time for assignment completion

### For the gifted student:

? Students will create a new spread sheet with graphs showing the percentage of increase/decrease in co2 car drag from original design compared to final design ? Students will incorporate average drag results for entire class, and compare average drag results with their own drag results

## Student Assessment:

See Rubric

## Lesson Evaluation:

Class discussion of test results, and what have students learned about aerodynamics as a result of this lesson

## Zip File Name:

[62Aerodynamics.zip](#)



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