



<b>Author(s):</b> <i>Michael Lucky Voiselle</i>			<b>Lesson Title:</b> <i>CRUSH A CAN WITH AIR</i>			
<b>Grade Span</b>			<b>ICLE Application Model</b>			
<i>K-4</i>	<i>5-8</i> <i>XX</i>	<i>9-12</i> <i>XX</i>	<i>A</i>	<i>B</i>	<i>C</i> <i>XX</i>	<i>D</i>

## Instructional Focus:

### Listening

Students listen for a variety of purposes appropriate to the grade level.

### Algebraic Concepts and Relationships

Students use algebraic methods to investigate, model, and interpret patterns and functions involving numbers, shapes, data, and graphs in a problem-solving situation. Students evaluate and communicate the reasoning used in solving these problems.

### Science as Inquiry

Students demonstrate knowledge and skills necessary to perform scientific inquiry.

### Communication

Students communicate and apply scientific concepts.

## Performance Task

Your task is to form a group of 2 or 3 students and crush a soda can with air. Follow these directions and be careful handling hot items.

Place about 20ml of water in a soda can and heat it over a hot plate or burner. Let the water boil vigorously for 10-15 seconds. Use a glove or beaker holder to remove the can from the heat source and immediately invert it into a bath of ice water. Each student is to record all observations from beginning to end in a neatly written conclusion write-up. The paper must be well organized and free from spelling and grammatical errors. Your paper must also address the following questions. You may use any resource available to help answer those questions.

You are to repeat the experiment at home and consult your family and or friends in answering the questions. State the opinions of at least three people in a neatly organized chart for each question.

1. What was in the can besides water?
2. What happens when water is boiled?
3. What will the air in the can do when the water boils?
4. What would happen if you did not invert the can?
5. What is the total force that is working on the outside of the can? Make your calculations in both English and Metric units using 1Kg=one square centimeter, and 14.7lbs=one square inch.

## ICLE Essential Skills

Apply in writing the rules and conventions of grammar, usage, punctuation, paragraphing and spelling. ELA1
Gather information from a variety of sources, including electronic sources, and summarize, analyze, and evaluate its use for a report. ELA3
Understand <i>basic algebraic properties</i> (i.e., commutative: $ab = ba$ ; associative: $ab(c) = a(bc)$ ; and distributive: $a(b+c) = (ab)+(ac)$ ). M3
Know and apply the principles of scientific inquiry. ( <i>Implicit in this statement are the processes of prediction, estimation, developing hypotheses, drawing conclusions, evaluation, and following ethical principles and professional procedures.</i> ) (Not Ranked) S topic 114
Know the metric system and the units of metric measure and convert metric units to English units. S4
Make observations using senses and instruments. Inferences and interpretations are arrived at based on observations. Classify observable properties and organize observations in a meaningful and logical way. S5

## Scoring Guide:

RATE THE CRITERIA: 3=Excellent, 2=Satisfactory, 1=Unsatisfactory, 0=does not attempt or does not understand	
<b>CRITERIA</b>	<b>SCORE</b>
Experimental procedure and group work	_____
Observations included in write-up	_____
Observation chart is neatly organized and includes information from 3 people.	_____
Write-up is neatly written and well organized	_____
Write-up is free from spelling and grammatical errors	_____
All questions are addressed in the write-up	_____
Calculations are neat and correct	_____

**Keywords**

<b>English Language Arts</b>	<b>Mathematics</b>	<b>Science</b>
<b>Reading</b>	<b>Algebra-Algebraic Operation, Computation</b>	<b>Earth Science- Atmosphere</b>
<b>Writing-Spelling, Grammar</b>	<b>Geometry</b>	<b>Life Science</b>
<b>Communications- Discussion, Questioning</b>	<b>Statistics</b>	<b>Chemistry</b>
<b>Literature</b>	<b>Calculus</b>	<b>Physics-Air Pressure</b>
<b>Other</b>	<b>Trigonometry</b>	<b>Other</b>
	<b>Other</b>	