

## Constructing a Hydraulic Brake System

Category	Level 1	Level 2	Level 3	Level 4
<b>Knowledge and understanding</b> <ul style="list-style-type: none"> <li>Worksheet #1</li> <li>Worksheet #2</li> <li>Quiz</li> <li>Lab Report (Predictions and observations)</li> <li>Research Report (Brake history, 3 Types of brakes)</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates limited knowledge of density, volume and pressure</li> <li>Demonstrates limited knowledge of Pascal's principle</li> <li>Demonstrates limited knowledge of quiz skills</li> <li>Demonstrates limited conceptual understanding of the physics principles.</li> <li>Meets all requirements of the report with limited effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates some knowledge of density, volume and pressure</li> <li>Demonstrates some knowledge of Pascal's principle</li> <li>Demonstrates some knowledge of quiz skills</li> <li>Demonstrates some conceptual understanding of the physics principles.</li> <li>Meets all requirements of the report with limited effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates considerable knowledge of density, volume and pressure</li> <li>Demonstrates considerable knowledge of Pascal's principle</li> <li>Demonstrates considerable knowledge of quiz skills</li> <li>Demonstrates considerable conceptual understanding of the physics principles.</li> <li>Meets all requirements of the report with limited effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates thorough knowledge of density, volume and pressure</li> <li>Demonstrates thorough knowledge of Pascal's principle</li> <li>Demonstrates thorough knowledge of quiz skills</li> <li>Demonstrates thorough conceptual understanding of the physics principles.</li> <li>Meets all requirements of the report with limited effectiveness</li> </ul>
<b>Application</b> <ul style="list-style-type: none"> <li>Constructing a Hydraulic Brake Assembly</li> </ul>	<ul style="list-style-type: none"> <li>Poor construction. Looks like a last minute project</li> <li>Brake does not stop rotational motion of tire</li> </ul>	<ul style="list-style-type: none"> <li>Brake assembly holds together but appears fragile</li> <li>Brake pads rub against rotor but take significant time to stop the rotational motion</li> </ul>	<ul style="list-style-type: none"> <li>Good construction and attention to detail</li> <li>Brake works effectively</li> </ul>	<ul style="list-style-type: none"> <li>Excellent and neat design.</li> <li>Brake stops rotational motion very quickly</li> </ul>
<b>Thinking and Inquiry</b> <ul style="list-style-type: none"> <li>Lab Report (Analysis – Math)</li> <li>Lab Report (Analysis – Written Component)</li> </ul>	<ul style="list-style-type: none"> <li>Math component missing from report</li> <li>Written responses are point form and do not sufficiently address the question</li> </ul>	<ul style="list-style-type: none"> <li>Calculations contain some errors</li> <li>Written responses somewhat address the question</li> </ul>	<ul style="list-style-type: none"> <li>Calculations contain few errors</li> <li>Written responses answer the question effectively</li> </ul>	<ul style="list-style-type: none"> <li>Calculations clearly laid out with no errors.</li> <li>Written responses answer the question thoroughly and make connections to prior concepts.</li> </ul>
<b>Communication</b> <ul style="list-style-type: none"> <li>Mathematical expression and overall organization of ideas (<b>Assessed thorough the entire project</b>)</li> <li>Sequence (Lab Report and Research Report)</li> <li>Clarity(Lab Report and Research Report)</li> </ul>	<ul style="list-style-type: none"> <li>uses conventions, vocabulary, and mathematical terminology with limited effectiveness</li> <li>No order for the required items</li> <li>Sections not labelled nor separated; English poor;</li> </ul>	<ul style="list-style-type: none"> <li>uses conventions, vocabulary, and mathematical terminology with some effectiveness</li> <li>Logically sequenced with some omissions</li> <li>Sections labelled but not separated; frequent errors in grammar;</li> </ul>	<ul style="list-style-type: none"> <li>uses conventions, vocabulary, and mathematical terminology with considerable effectiveness</li> <li>Logically sequenced with few omissions</li> <li>Sections clearly labelled but not separated; English generally correct;</li> </ul>	<ul style="list-style-type: none"> <li>uses conventions, vocabulary, and mathematical terminology with thorough effectiveness</li> <li>Logically sequenced with all relevant categories present</li> <li>Report sections clearly distinct from each other; grammatically correct English</li> </ul>