

Applied Sciences in Palaeontology – Physics

Calculation Sheet

Module 1	Calculate the Bite Force of a <i>Tyrannosaurus rex</i>
<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">Q1</div> <p>Find the Bending Strength of the jaw:</p> <p>1) Formula:</p> <p>Where a is the _____ of the ellipse, and b is the _____ .</p> <p>2) Insert values:</p> <p>Value of a =</p> <p>Value of b =</p> <p>3) Solve formula. Calculate below:</p> <hr style="border-top: 1px dashed black;"/> <p>► Bending Strength of the jaw:</p> <p style="text-align: center;">$Z =$</p>	<div style="border: 1px solid black; padding: 5px; display: inline-block; margin-bottom: 10px;">Q2</div> <p>Use the Bending Strength to find Bite Force:</p> <p>1) Formula:</p> <p>Where L is the _____ of the jaw.</p> <p>2) Value of L =</p> <p>3) Solve formula. Calculate below:</p> <hr style="border-top: 1px dashed black;"/> <p>► Bite Force of the jaw:</p> <p style="text-align: center;">$F =$</p>

Module 2		Calculate the Velocity of a <i>Tyrannosaurus rex</i>	
<p>Q3 Calculate the hip height of <i>T. rex</i>:</p> <p>1) Formula:</p> <p>Where L is the _____ of the _____.</p> <p>2) Calculate hip height below:</p> <p>Value of L =</p> <hr style="border-top: 1px dashed black;"/> <p>► Hip height of <i>T. rex</i>:</p> <p style="text-align: center;">$h =$</p>	<p>Q5 Calculate the Relative Stride Length of <i>T. rex</i>:</p> <p>1) Formula:</p> <p>2) Calculate below:</p> <hr style="border-top: 1px dashed black;"/> <p>► Relative Stride Length of <i>T. rex</i>:</p> <p style="text-align: center;">$R =$</p>		
<p>Free information!</p> <p>» <i>T. rex</i> stride length (λ) = 7.32 m</p>		<p>Q6 Calculate the velocity of <i>T. rex</i>:</p> <p>Formula:</p>	
<p>Q4 Transpose the equation to solve for velocity:</p> <p>Froude Number Formula:</p> <p>Transpose below:</p> <hr style="border-top: 1px dashed black;"/> <p>► Formula for velocity:</p>	<hr style="border-top: 1px dashed black;"/> <p>► Velocity of <i>T. rex</i>:</p> <p style="text-align: center;">$v =$</p>		

Module 3		Calculate the Energy of an Asteroid Impact	
Q7	What is the formula to calculate mass?	Q10	Calculate the kinetic energy (KE) of the asteroid: Formula:
Q8	Calculate the volume of the asteroid: Formula:	Value of $v =$ Calculate:	
<p>► Volume of asteroid:</p> <p style="text-align: center;">$V =$</p>		<p>► Kinetic energy of asteroid:</p> <p style="text-align: center;">$KE =$</p>	
Q9	Calculate the mass of the asteroid: Value of $\rho =$		
<p>► Mass of asteroid:</p> <p style="text-align: center;">$m =$</p>			