

## Topic: Growth and Decay

Topic/Skill	Definition/Tips	Example
1. Exponential Growth	<p>When we <b>multiply</b> a number <b>repeatedly</b> by the <b>same number</b> (<math>\neq 1</math>), resulting in the number <b>increasing by the same proportion</b> each time.</p> <p>The original amount can grow very quickly in exponential growth.</p>	<p>1, 2, 4, 8, 16, 32, 64, 128 ... is an example of exponential growth, because the numbers are being multiplied by 2 each time.</p>
2. Exponential Decay	<p>When we <b>multiply</b> a number <b>repeatedly</b> by the <b>same number</b> (<math>0 &lt; x &lt; 1</math>), resulting in the number <b>decreasing by the same proportion</b> each time.</p> <p>The original amount can decrease very quickly in exponential decay.</p>	<p>1000, 200, 40, 8 ... is an example of exponential decay, because the numbers are being multiplied by <math>\frac{1}{5}</math> each time.</p>
3. Compound Interest	<p>Interest paid on the <b>original amount and the accumulated interest</b>.</p>	<p>A bank pays 5% compound interest a year. Bob invests £3000. How much will he have after 7 years.</p> $3000 \times 1.05^7 = \text{£}4221.30$
4. Exponential Graph	<p>The equation is of the form <math>y = a^x</math>, where <math>a</math> is a number called the <b>base</b>.</p> <p>If <math>a &gt; 1</math> the graph <b>increases</b>. If <math>0 &lt; a &lt; 1</math>, the graph <b>decreases</b>.</p> <p>The graph has an <b>asymptote</b> which is the <b>x-axis</b>.</p> <p>The <b>y-intercept</b> of the graph <math>y = a^x</math> is <b>(0, 1)s</b></p>	