Physics Equations Sheet  
GCSE Additional Science / Physics  
(AS1, AS2 and PH2)

<table>
<thead>
<tr>
<th>Equation</th>
<th>Description</th>
</tr>
</thead>
</table>
| \( a = \frac{F}{m} \) or \( F = m \times a \) | \( F \) resultant force  
\( m \) mass  
\( a \) acceleration |
| \( a = \frac{v - u}{t} \) | \( a \) acceleration  
\( v \) final velocity  
\( u \) initial velocity  
\( t \) time taken |
| \( W = m \times g \) | \( W \) weight  
\( m \) mass  
\( g \) gravitational field strength |
| \( F = k \times e \) | \( F \) force  
\( k \) spring constant  
\( e \) extension |
| \( W = F \times d \) | \( W \) work done  
\( F \) force applied  
\( d \) distance moved in the direction of the force |
| \( P = \frac{E}{t} \) | \( P \) power  
\( E \) energy transferred  
\( t \) time taken |
| \( E_p = m \times g \times h \) | \( E_p \) change in gravitational potential energy  
\( m \) mass  
\( g \) gravitational field strength  
\( h \) change in height |
| \( E_k = \frac{1}{2} \times m \times v^2 \) | \( E_k \) kinetic energy  
\( m \) mass  
\( v \) speed |
| \( p = m \times v \) | \( p \) momentum  
\( m \) mass  
\( v \) velocity |
| \( I = \frac{Q}{t} \) | \( I \) current  
\( Q \) charge  
\( t \) time |
<table>
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<tbody>
<tr>
<td>( V = \frac{W}{Q} )</td>
<td>Potential difference, ( V ) work done, ( W ) charge</td>
</tr>
<tr>
<td>( V = I \times R )</td>
<td>Potential difference, ( V ) current, ( I ) resistance</td>
</tr>
<tr>
<td>( P = \frac{E}{t} )</td>
<td>Power, ( P ) energy, ( E ) time, ( t )</td>
</tr>
<tr>
<td>( P = I \times V )</td>
<td>Power, ( P ) current, ( I ) potential difference, ( V )</td>
</tr>
<tr>
<td>( E = V \times Q )</td>
<td>Energy, ( E ) potential difference, ( V ) charge, (Higher Tier only)</td>
</tr>
</tbody>
</table>

**Potential Difference**

- **Symbol:** \( V \)
- **Units:** volts (V)

**Current**

- **Symbol:** \( I \)
- **Units:** amperes (A)

**Resistance**

- **Symbol:** \( R \)
- **Units:** ohms (Ω)

**Power**

- **Symbol:** \( P \)
- **Units:** watts (W)

**Energy**

- **Symbol:** \( E \)
- **Units:** joules (J)

**Work Done**

- **Symbol:** \( W \)
- **Units:** joules (J)

**Electric Charge**

- **Symbol:** \( Q \)
- **Units:** coulombs (C)