SEX-LINKED INHERITANCE

- This is a form of inheritance where the gene/allele for the characteristic being studied is on the ___________ chromosome.
- Diseases such as colour-blindness and haemophilia are inherited this way, and are more common in ___________ than females.

HAEMOPHILIA

- **Alleles, Genotypes and Phenotypes for Haemophilia (Blood-Clotting Inability)**
  
  \( X_H \) – allele for normal blood clotting  
  \( X_h \) – allele for haemophilia

  \( X_HX_H \) – genotype of normal female  
  \( X_hX_h \) – genotype of haemophiliac female  
  \( X_HX_h \) – genotype of carrier female (with normal blood-clotting ability, but who can pass the ___________ gene to her children)

  \( X_HY \) – genotype of normal male  
  \( X_hY \) – genotype of haemophiliac male

- **Example 1 – Haemophilia**
  A man with normal blood-clotting ability \( (X_HY) \) marries a woman who is a haemophiliac \( (X_hX_h) \). The possible phenotypes of their children are ...

<table>
<thead>
<tr>
<th></th>
<th>( X_H )</th>
<th>( Y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_h )</td>
<td>( X_HX_h )</td>
<td>( X_hY )</td>
</tr>
<tr>
<td>( X_h )</td>
<td>( X_hX_h )</td>
<td>( X_hY )</td>
</tr>
</tbody>
</table>

  Possible genotypes = 1 \( X_HX_h \) : 1 \( X_hY \)  
  Possible phenotypes  
  = 1 ___________ female : 1 _________________ male

- **Example 2 – Haemophilia**
  A normal woman \( (X_HX_H) \) marries a haemophiliac man \( (X_hY) \). The possible genotypes and phenotypes of the children are...

<table>
<thead>
<tr>
<th></th>
<th>( X_H )</th>
<th>( X_h )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( X_h )</td>
<td>( X_HX_h )</td>
<td>( X_hX_h )</td>
</tr>
<tr>
<td>( Y )</td>
<td>( X_HY )</td>
<td>( X_hY )</td>
</tr>
</tbody>
</table>

  Possible genotypes = 1 \( X_HX_h \) : 1\( X_HY \)  
  Possible phenotypes  
  = 1 ___________ female : 1 _________________ male

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**RED-GREEN COLOUR BLINDNESS**

- **Alleles, Genotypes and Phenotypes for Colour-blindness**

  Xc - allele for normal colour vision  
  Xc - allele for colour-blindness  

  Xc Xc - genotype of normal female  
  Xc Xc - genotype of colourblind female  
  Xc Xc - genotype of carrier female (with normal colour vision, but who can pass the defective gene to her children)  
  Xc Y - genotype of normal male  
  Xc Y - genotype of colourblind male

- **Example 3 – Colour Blindness**

  A male with normal vision (XcY) and a colourblind female (Xc Xc) have children. The possible genotypes and phenotypes of the children are ...

<table>
<thead>
<tr>
<th></th>
<th>Xc</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xc</td>
<td>XcXc</td>
<td>XcY</td>
</tr>
<tr>
<td>Xc</td>
<td>XcXc</td>
<td>XcY</td>
</tr>
</tbody>
</table>

  Possible genotypes =  
  Possible phenotypes =

- **Example 4 – Colour Blindness**

  A carrier female (Xc Xc) marries a normal-visioned male (Xc Y). The possible genotypes and phenotypes of the children are...

<table>
<thead>
<tr>
<th></th>
<th>Xc</th>
<th>Xc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xc</td>
<td>XcXc</td>
<td>XcXc</td>
</tr>
<tr>
<td>Y</td>
<td>XcY</td>
<td>XcY</td>
</tr>
</tbody>
</table>

  Possible genotypes =  
  Possible phenotypes =

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