The Nuclear Bomb

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What is a Nuclear Bomb?

- **Why it goes bang:**
  - Draws on the power stored in the atom
  - Certain isotopes will “fission”
  - A critical mass will become self-sustaining
  - Uranium 235 and plutonium 239
  - Atom bombs and hydrogen bombs

- **What it does:**
  - (1) Significant damage and destruction is caused by the blast
  - (2) Radiation poisoning and other nasty illnesses are caused by the fallout after the explosion
How powerful are nuclear bombs?

- Hiroshima and Nagasaki
  - First and only nuclear use in 1945
  - 16-20kt blasts
  - Estimated casualties: ~200,000

- The Tsar Bomba
  - Tested in 1961 by the Soviet Union
  - 57 megaton blast
  - 5km fireball
  - 3rd degree burns at 60km

### Who Has Nuclear Weapons?

<table>
<thead>
<tr>
<th>Country</th>
<th>First Nuclear Test</th>
<th>Estimated Nuclear Weapons</th>
</tr>
</thead>
<tbody>
<tr>
<td>The United States</td>
<td>1945</td>
<td>7,300</td>
</tr>
<tr>
<td>Soviet Union/ Russia</td>
<td>1949</td>
<td>8,000</td>
</tr>
<tr>
<td>The UK</td>
<td>1952</td>
<td>225</td>
</tr>
<tr>
<td>France</td>
<td>1960</td>
<td>300</td>
</tr>
<tr>
<td>China</td>
<td>1964</td>
<td>250</td>
</tr>
<tr>
<td>India</td>
<td>1998</td>
<td>110</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1998</td>
<td>80</td>
</tr>
<tr>
<td>North Korea</td>
<td>2006</td>
<td>Less than 10</td>
</tr>
<tr>
<td><em>Israel</em></td>
<td>1979</td>
<td>80</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>~16,300</strong></td>
</tr>
</tbody>
</table>
The UK and Nuclear Weapons

- Four nuclear powered submarines
  - Each boat can carry 16 missiles
  - Each missile can carry up to 14 warheads
  - Each warhead can be up to 100kt yield

- One of these submarines is on patrol at all times ready to fire

- A decision to replace this will be made in 2016

Building new Trident submarines will cost us £15-20 billion. What else could we do with the money?

<table>
<thead>
<tr>
<th>600</th>
<th>new schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>11,000,000</td>
<td>homes insulated and made more energy efficient</td>
</tr>
<tr>
<td>350,000</td>
<td>affordable homes</td>
</tr>
<tr>
<td>7,500</td>
<td>megawatts of wind power</td>
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<tr>
<td>70</td>
<td>fully equipped new hospitals</td>
</tr>
<tr>
<td>1,280</td>
<td>high speed trains</td>
</tr>
</tbody>
</table>
Our Nuclear Future...

- The nuclear disarmament movement is at its strongest for many years

- But - there are still more than enough nukes to destroy the planet

- Many impediments and problems remain
  - Iran and nuclear terrorism
  - Spread of nuclear power

- As long as nuclear weapons exist there is always a chance they might be used
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