Compound Interest by Repeating Simple Interest Assignment

1. Complete the charts and graph each set of results on the same set of axes below.
   a) $700 earns 9% simple interest for 7 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Principal</th>
<th>Interest</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>700</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>1</td>
<td>700</td>
<td>63</td>
<td>763</td>
</tr>
<tr>
<td>2</td>
<td>700</td>
<td>126</td>
<td>826</td>
</tr>
<tr>
<td>3</td>
<td>700</td>
<td>189</td>
<td>889</td>
</tr>
<tr>
<td>4</td>
<td>700</td>
<td>252</td>
<td>952</td>
</tr>
<tr>
<td>5</td>
<td>700</td>
<td>315</td>
<td>1015</td>
</tr>
<tr>
<td>6</td>
<td>700</td>
<td>378</td>
<td>1078</td>
</tr>
<tr>
<td>7</td>
<td>700</td>
<td>441</td>
<td>1141</td>
</tr>
</tbody>
</table>

What do you notice about the amount of interest earned each year?

Always goes up by $63

What is this type of growth referred to as?

Simple interest
Interest is always the same

b) $700 earns 9% interest compounded annually for 7 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Principal</th>
<th>Interest</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>700</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>1</td>
<td>763.67</td>
<td>63</td>
<td>763</td>
</tr>
<tr>
<td>2</td>
<td>831.67</td>
<td>58.28</td>
<td>889.95</td>
</tr>
<tr>
<td>3</td>
<td>906.52</td>
<td>69.03</td>
<td>975.55</td>
</tr>
<tr>
<td>4</td>
<td>988.11</td>
<td>71.93</td>
<td>1057.04</td>
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<tr>
<td>5</td>
<td>1077.97</td>
<td>75.96</td>
<td>1153.93</td>
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<td>6</td>
<td>1173.97</td>
<td>78.36</td>
<td>1252.33</td>
</tr>
<tr>
<td>7</td>
<td>1279.63</td>
<td>80.74</td>
<td>1360.37</td>
</tr>
</tbody>
</table>

What do you notice about the amount of interest earned each year?

Interest is growing

What is this type of growth referred to as?

Exponential

Describe a situation where compound interest would NOT be the better choice.

Borrowing money

Adapted from OAME Support Resources for MBF3C – Personal Finance
2. A financial institution offers Mike two investment options.

   **Plan A:** 5.0% per year, simple interest
   **Plan B:** 4.3% per year, compounded yearly

   a) If she has $4,000 to invest, which plan should she choose if she can invest for
      i. 2 years
      ii. 10 years

   **SOLUTION**

   **Investing for two years**
   Simple Interest Calculation (5.0%)

   \[
   I = Prt \\
   I = 4000 \times 0.05 \times 2 \\
   I = 400 \\
   A = 4400
   \]

   Therefore she earns more money if she chooses Plan B.

   **Investing for ten years**
   Simple Interest Calculation (5.0%)

   \[
   I = Prt \\
   I = 4000 \times 0.05 \times 10 \\
   I = 2000 \\
   A = 6000
   \]

   Therefore she earns more money if she chooses Plan B.

   b) How much additional interest would she have made by choosing the best plan for each
      amount in part a)?

      If investing for 2 years, she earns \( \frac{486.00}{94.02} \) more interest if she chooses plan B.
      If investing for 10 years, she earns \( \frac{5842.78}{6094.02} \) more interest if she chooses plan B.

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Adapted from OAME Support Resources for MBF3C – Personal Finance