# Horsepower vs. Weight Graphing Activity

As you tour the plane hangars, read the Specification section of the information panels to find the **Horsepower** and **Empty Weight** of each aircraft. Record this information in the chart and graph it by placing a dot at the intersection of the HP and weight.

**Horsepower** is the amount of force an engine creates.  
**Weight** is the force of attraction to the Earth.

<table>
<thead>
<tr>
<th>Plane</th>
<th>HP</th>
<th>Weight</th>
<th>Plane</th>
<th>HP</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piper J-3 Cub</td>
<td></td>
<td></td>
<td>SBD Dauntless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anderson-Greenwood AG-14</td>
<td></td>
<td></td>
<td>B25 Mitchell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beechcraft Baron</td>
<td>X 2=</td>
<td></td>
<td>TBM-3E Avenger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stearman PT-17 Kaydet</td>
<td></td>
<td></td>
<td>DC-3A X 2=</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SNJ T-6 Texan</td>
<td></td>
<td></td>
<td>F4U Corsair</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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## Horsepower and Weight of Airplanes

Horsepower

<table>
<thead>
<tr>
<th>5,000</th>
<th>4,750</th>
<th>4,500</th>
<th>4,250</th>
<th>4,000</th>
<th>3,750</th>
<th>3,500</th>
<th>3,250</th>
<th>3,000</th>
<th>2,750</th>
<th>2,500</th>
<th>2,250</th>
<th>2,000</th>
<th>1,750</th>
<th>1,500</th>
<th>1,250</th>
<th>1,000</th>
<th>750</th>
<th>500</th>
<th>250</th>
</tr>
</thead>
</table>

Empty Weight (lbs)
Horsepower vs. Weight Graphing Questions

After recording and graphing your horsepower and weight data, answer these questions.

Horsepower is the force an engine creates to push the plane forward. Larger engines create more horsepower and are needed for heavier or faster planes.

1. Do the data points fall in a pattern, or are they random? ________________________________

2. What shape do the data points form? ________________________________

3. What does this tell you about the relationship between horsepower (force) and weight of airplanes? ________________________________

4. Find the point for the DC-3. Does it fit into the pattern? ________________________________

5. Go look at the DC-3 (large silver plane) Do you think the difference in the DC-3 that shows on the graph is an □ advantage, or a □ disadvantage?
   a. The data graph shows that a DC-3 has (□ more / □ less) horsepower than a typical plane with the same weight.
   b. If the DC-3 was a typical plane, its horsepower would be around ____________.
   c. It has (□ more / □ less) horsepower because the engines are (□ smaller/ □ larger), so it uses (□ more/ □ less) fuel, and this is an (□ advantage / □ disadvantage).
   d. What words would you use to describe the DC-3? ________________________________

6. Find the points for the A-1D Skyraider and the B-17 Flying Fortress. These planes did the same job and could carry the same bomb loads, but the Skyraider was designed about 10 years after the B-17 was used in World War II. What does the data graph tell you about technology in the 10 year difference?

7. Why is it helpful to show information in charts or graphs?

______________________________

______________________________

______________________________

______________________________
Horsepower vs. Weight Graphing Activity

As you tour the plane hangars, read the Specification section of the information panels to find the Horsepower and Empty Weight of each aircraft. Record this information in the chart and graph it by placing a dot at the intersection of the HP and weight.

**Horsepower** is the amount of force an engine creates. **Weight** is the force of attraction to the Earth.

<table>
<thead>
<tr>
<th>Plane</th>
<th>HP</th>
<th>Weight</th>
<th>Plane</th>
<th>HP</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piper J-3 Cub</td>
<td>65</td>
<td>640</td>
<td>SBD Dauntless</td>
<td>1,200</td>
<td>6,535</td>
</tr>
<tr>
<td>Anderson-Greenwood AG-14</td>
<td>90</td>
<td>850</td>
<td>B25 Mitchell</td>
<td>1700 x 2 = 3400</td>
<td>19,480</td>
</tr>
<tr>
<td>Beechcraft Baron</td>
<td>285 X 2 = 570</td>
<td>3,085</td>
<td>TBM-3E Avenger</td>
<td>1,900</td>
<td>10,545</td>
</tr>
<tr>
<td>Stearman PT-17 Kaydet</td>
<td>220</td>
<td>1,936</td>
<td>DC-3A</td>
<td>1000 X 2 = 2000</td>
<td>16,865</td>
</tr>
<tr>
<td>SNJ Texan</td>
<td>600</td>
<td>4,185</td>
<td>F4U Corsair</td>
<td>2,300</td>
<td>9,803</td>
</tr>
</tbody>
</table>
Horsepower vs. Weight Graphing Questions

After recording and graphing your horsepower and weight data, answer these questions.

Horsepower is the force an engine creates to push the plane forward. Larger engines create more horsepower and are needed for heavier or faster planes.

1. Do the data points fall in a pattern, or are they random? **The data points form a pattern**

2. What shape do the data points form? **They form a curved line**

3. What does this tell you about the relationship between horsepower (force) and weight of airplanes? **As weight increases, horsepower also increase.**

4. Find the point for the DC-3. Does it fit into the pattern? **No.**

5. Go look at the DC-3 (large silver plane) Do you think the difference in the DC-3 shows an advantage, or a disadvantage?
   a. The data graph shows that a DC-3 has **more** horsepower than a typical plane with the same weight.
   b. If the DC-3 was a typical plane, its horsepower would be around 3,200___________.
   c. It has **more** horsepower because the engines are **smaller**, so it uses **more** fuel, and this is an **advantage**.
   d. What words would you use to describe the DC-3? Efficient, better, advantageous, etc._________

6. Find the points for the A-1D Skyraider and the B-17 Flying Fortress. These planes did the same job and could carry the same bomb loads, but the Skyraider was designed about 10 years after the B-17 was used in World War II. What does the data graph tell you about technology in the 10 year difference?
   **In the 10 years planes were developed to have more horsepower with less weight**

7. Why is it helpful to show information in charts or graphs?
   **It is easier to compare information when it is shown in a visual way instead of just text. You can see which things are the same and what is different.**