

Name:

Date:

Class:

## Sole Survivors Student Worksheet

### Part 1: Research & Design

**Your Foot Condition:** \_\_\_\_\_

**Brief Description:** Read the article provided and write 2-3 sentences explaining the foot condition and how an orthotic could help.

**Orthotic Design Goals:** List what your orthotic needs to do to help with this condition.

**Sketch Your Orthotic Insole Design:** Use the space below to draw the shape and label where you will use soft, medium, or firm foam.

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### Part 2: Data Collection — Ball Drop Impact Test

Drop Height (cm)	Indent Depth (mm) Without Orthotic	Indent Depth (mm) With Orthotic
30 - simulates standing		
60 - simulates running		
90 - simulates jumping		
120 - carrying backpack		

### Part 3: Graphing Your Results

**Instructions:** Use the grid to plot your indent depths (in mm) against drop height (in cm). Create two separate graphs, one for "Without Orthotic" and one for "With Orthotic." Label your axes clearly.

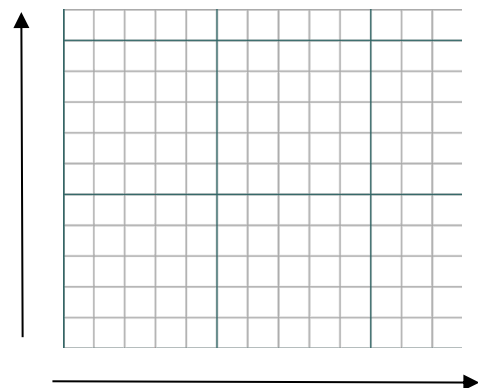
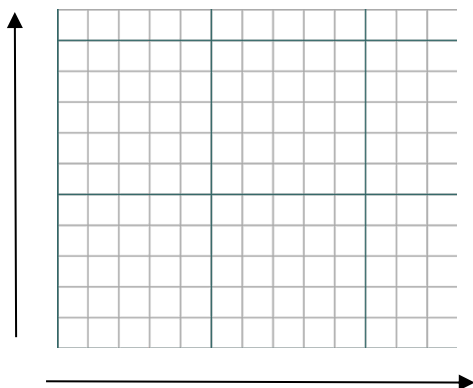
X-axis: Drop Height (cm) — Mark 0 to 160 cm in increments of 30 cm.

Y-axis: Indent Depth (mm) — Mark from 0 to max indent depth based on your data.

#### Graph 1: Without Orthotic

#### Graph 2: With Orthotic

*Graph 2 different lines for different thicknesses of orthotics*



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#### Part 4: Analysis and Advertisement

1. When you dropped the weight from a higher height, what happened to the force on the orthotic?
2. Explain how the speed and kinetic energy of the weight affected the amount of energy transferred through the material.
3. How does your orthotic help reduce pressure on the foot?

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4. Write a short advertisement slogan or message for your orthotic targeted to doctors: