v_1 = child 1 vel

v_2 = child 2 vel

1. $\frac{1}{2}kS_1^2 = \frac{1}{2}mv^2$

$kS^2 = mv^2$

$k = \frac{mv_f^2}{S^2}$

$v_f^2 = v_i^2 + 2a\Delta x$

$v_f = \sqrt{2g\Delta x_1}$

$v_2 = \sqrt{2g\Delta x_2}$

$\frac{S_1^2}{mv_f^2}: \frac{1}{2}\left(\frac{mv_f^2}{S_1^2}\right)S_2^2 = \frac{1}{2}mv_2^2$

$S_2^2 = \frac{mv_2^2 \cdot S_1^2}{mv_1^2}$

$S_2^2 = \frac{v_2^2 \cdot S_1^2}{v_1^2}$

$S_2 = \sqrt{\frac{v_2^2 \cdot S_1^2}{v_1^2}} = \sqrt{\frac{(\sqrt{2g\Delta x_1})^2 \cdot (0.11)^2}{(\sqrt{2g\Delta x_2})^2}}$

$\boxed{S_2 = 1.174\,cm}$