Tower Challenge

Design Statement: *"Design and construct a tower capable of holding a standard brick. An unlimited quantity of 4 x 6 inch index cards and staples may be used. The index cards represent building material costs, the staples represent assembly costs, and the folds in the index cards represent production costs. Every index card, staple, and fold costs $1.00."*

Obviously, you want to build the most cost-efficient tower using the fewest number of cards and the cleverest design. You are given specific design parameters with which your structure must comply. Material costs, assembly costs, and production costs must be considered.

Materials include an unlimited quantity of 4 x 6 inch index cards, staples, and a stapler. A standard brick is used which has the dimensions of 8.5 inches x 3.25 inches x 2.75 inches. The brick weighs approximately 4.5 pounds.

Design parameters:

- The tower must be at least eleven inches tall.
- The tower must be capable of holding a brick for at least five seconds.
- The tower must be one unit that can be picked up and placed on the testing table.
- All folds must be discrete. No index cards rolled into tubes allowed.
- Any 'partial' bend counts as a full bend (cost=$1).
- A separate count of staples, cards, and folds used during construction must be kept.
- Every index card, staple, and fold used costs a hypothetical $1.00.

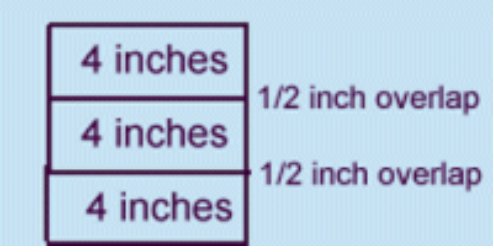
What is the best way to fulfill the eleven inch height requirement?

1. Example One: Three cards are used. Cards overlap one half inch. Three staples are used to attach the card. In this configuration, the total height is eleven inches.

   material costs = $3.00

   assembly costs = $6.00

   total cost = $9.00/unit



2. Example Two: Two cards are used. Cards overlap one inch. Two staples are used to attach the cards. In this configuration, the total height is eleven inches.

material costs = $2.00

assembly costs = $2.00

total cost = $4.00/unit