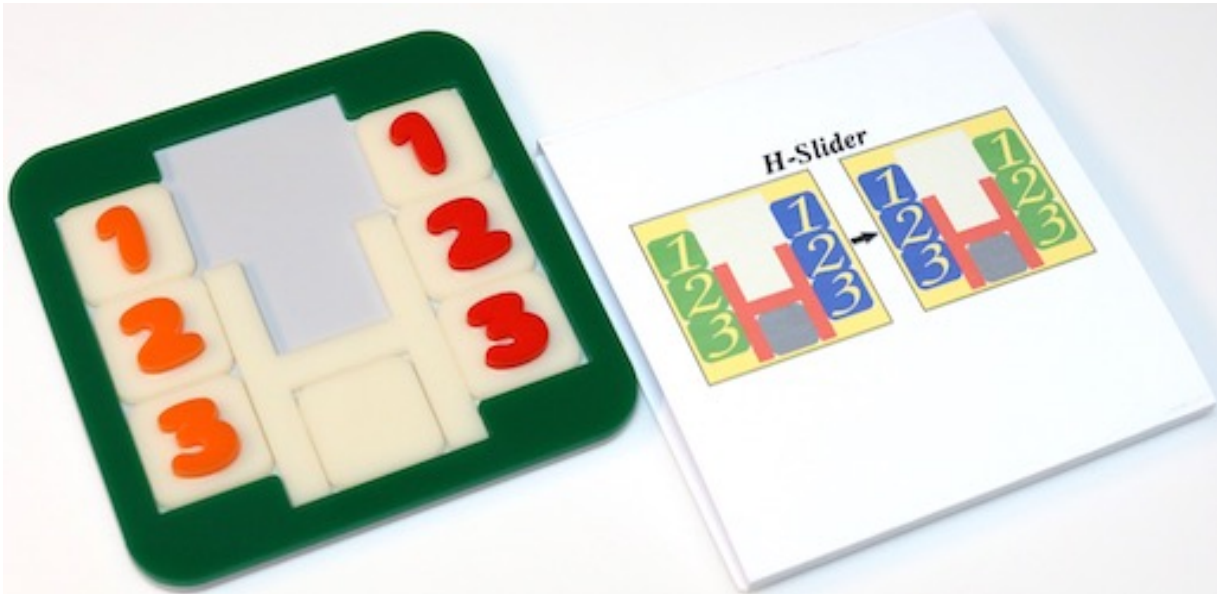


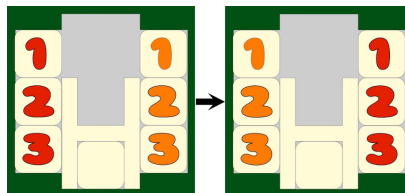
H-Slider



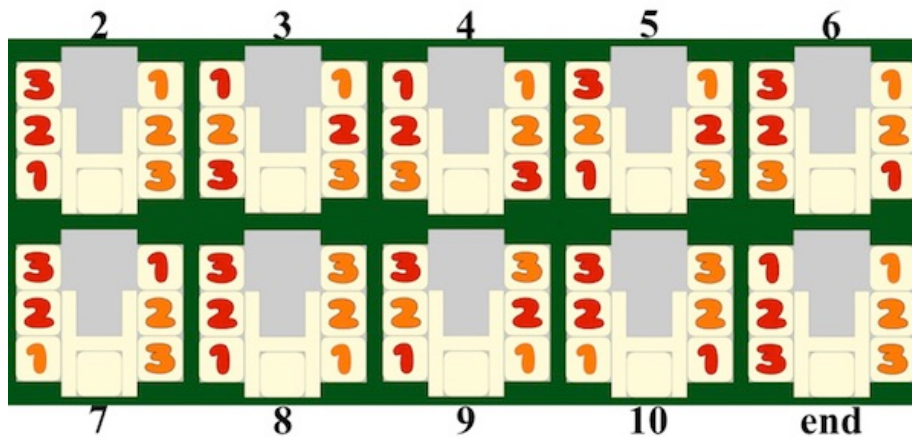
Designed and made by Diniar Namdarian, 2016; sleeve by J. A. Storer.

(plastic, $5\frac{1}{8}$ " high by $5\frac{1}{8}$ " wide x $\frac{3}{8}$ " thick; H arms are $\frac{1}{3}$ the width of a square)

The H piece can slide carrying one or two pieces with it. Starting with red 1-2-3 on the left and orange 1-2-3 on the right, "Problem 1" is exchange them:



One can place a finger on the H itself or on one of the pieces it contains to push, which can move two pieces with the H, or only one, where another may be left behind. The directions show 9 other problems, all with the *same* end position as the start position for Problem 1:



The next page shows a solution of 57 moves for Problem 1; moves to solve the others are:

2 = 35 moves, **3** = 49 moves, **4** = 31 moves, **5** = 54 moves, **6** = 40 moves,

7 = 36 moves, **8** = 46 moves, **9** = 29 moves, **10** = 47 moves.

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H-Slider Solution

Here is a solution of 57 rectilinear moves (60 straight-line moves):

<p>0:</p> <pre> \$ \$ \$ 1 1 1 1 1 1 1 1 1 2 2 2 H 2 2 2 H 3 3 3 H H H H 3 3 3 H X X X H 3 3 3 H X X X H 3 3 3 H X X X H \$ \$ \$ </pre>	<p>1-4. Move 1,2,3,H:</p> <pre> \$ \$ \$ H 1 1 1 H \$ \$ \$ 2 2 2 H 1 1 1 H A A A 2 2 2 H 1 1 1 H A A A 2 2 2 H H H H H A A A 3 3 3 H X X X H B B B 3 3 3 H X X X H B B B 3 3 3 H X X X H B B B \$ \$ \$ </pre>	<p>5. Move C:</p> <pre> \$ \$ \$ H 1 1 1 H \$ \$ \$ 2 2 2 H 1 1 1 H A A A 2 2 2 H 1 1 1 H A A A 2 2 2 H H H H H A A A 3 3 3 H X X X H B B B 3 3 3 H X X X H B B B 3 3 3 H X X X H B B B C C C C C C C C C \$ \$ \$ </pre>	<p>6-9. Move B,A,H,1:</p> <pre> \$ \$ \$ 2 2 2 2 2 2 2 2 2 3 3 3 H 3 3 3 H 3 3 3 H C C C H H H H C C C H X X X H C C C H X X X H \$ \$ \$ H X X X H \$ \$ \$ </pre>
<p>10-13. Move 2,3,C,H:</p> <pre> \$ \$ \$ H 2 2 2 H \$ \$ \$ 3 3 3 H 2 2 2 H 1 1 1 3 3 3 H 2 2 2 H 1 1 1 3 3 3 H H H H H 1 1 1 C C C H X X X H A A A C C C H X X X H A A A C C C H X X X H A A A B B B B B B B B B \$ \$ \$ </pre>	<p>14-15. Move B,X:</p> <pre> \$ \$ \$ H 2 2 2 H \$ \$ \$ 3 3 3 H 2 2 2 H 1 1 1 3 3 3 H 2 2 2 H 1 1 1 3 3 3 H H H H H 1 1 1 C C C H C C C H C C C H B B B B B B B B B \$ \$ \$ </pre>	<p>16-19. Move B,C,3,H:</p> <pre> \$ \$ \$ 1 1 1 1 1 1 1 1 1 1 1 1 3 3 3 H 2 2 2 H A A A 3 3 3 H 2 2 2 H A A A 3 3 3 H 2 2 2 H A A A C C C H H H H H X X X C C C H B B B B H X X X C C C H B B B B H X X X \$ \$ \$ H B B B H \$ \$ \$ </pre>	<p>20. Move 1:</p> <pre> \$ \$ \$ 1 1 1 1 1 1 1 1 1 1 1 1 3 3 3 H 2 2 2 H A A A 3 3 3 H 2 2 2 H A A A 3 3 3 H 2 2 2 H A A A C C C H H H H H X X X C C C H B B B B H X X X C C C H B B B B H X X X \$ \$ \$ H B B B H \$ \$ \$ </pre>
<p>21-23. Move A,X,H:</p> <pre> \$ \$ \$ H 2 2 2 H \$ \$ \$ 1 1 1 H 2 2 2 H A A A 1 1 1 H 2 2 2 H A A A 1 1 1 H H H H H A A A 3 3 3 H B B B B H X X X 3 3 3 H B B B B H X X X 3 3 3 H B B B B H X X X C C C C C C C C C \$ \$ \$ </pre>	<p>24. Move C:</p> <pre> \$ \$ \$ H 2 2 2 H \$ \$ \$ 1 1 1 H 2 2 2 H A A A 1 1 1 H 2 2 2 H A A A 1 1 1 H H H H H A A A 3 3 3 H B B B B H X X X 3 3 3 H B B B B H X X X 3 3 3 H B B B B H X X X C C C C C C C C C \$ \$ \$ </pre>	<p>25-28. Move 3,1,H,2:</p> <pre> \$ \$ \$ 2 2 2 2 2 2 2 2 2 1 1 1 H 1 1 1 H 1 1 1 H 3 3 3 H H H H H C C C 3 3 3 H B B B B H C C C 3 3 3 H B B B B H C C C \$ \$ \$ H B B B H \$ \$ \$ </pre>	<p>29-32. Move A,X,C,H:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ 2 2 2 H A A A H X X X 2 2 2 H A A A H X X X 2 2 2 H H H H H X X X 1 1 1 H B B B B H C C C 1 1 1 H B B B B H C C C 3 3 3 3 3 3 \$ \$ \$ </pre>
<p>33-34. Move 3,B:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ 2 2 2 H A A A H X X X 2 2 2 H A A A H X X X 2 2 2 H H H H H X X X 1 1 1 H 1 1 1 H 1 1 1 H B B B B B B B B B \$ \$ \$ </pre>	<p>35-38. Move 3,C,X,H:</p> <pre> \$ \$ \$ 2 2 2 2 2 2 2 2 2 1 1 1 H A A A H X X X 1 1 1 H A A A H X X X 1 1 1 H A A A H X X X B B B H H H H H C C C B B B H 3 3 3 H C C C B B B H 3 3 3 H C C C \$ \$ \$ H 3 3 3 H \$ \$ \$ </pre>	<p>39. Move 2:</p> <pre> \$ \$ \$ 2 2 2 2 2 2 2 2 2 1 1 1 H A A A H X X X 1 1 1 H A A A H X X X 1 1 1 H A A A H X X X B B B H H H H H C C C B B B H 3 3 3 H C C C B B B H 3 3 3 H C C C \$ \$ \$ H 3 3 3 H \$ \$ \$ </pre>	<p>40-42. Move 1,B,H:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ 1 1 1 H A A A H 2 2 2 1 1 1 H A A A H 2 2 2 1 1 1 H H H H H 2 2 2 B B B H 3 3 3 H X X X B B B H 3 3 3 H X X X C C C C C C \$ \$ \$ </pre>
<p>43. Move C:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ 1 1 1 H A A A H 2 2 2 1 1 1 H A A A H 2 2 2 1 1 1 H H H H H 2 2 2 B B B H 3 3 3 H X X X B B B H 3 3 3 H X X X B B B H 3 3 3 H X X X C C C C C C C C C \$ \$ \$ </pre>	<p>44-46. Move X,2,H:</p> <pre> \$ \$ \$ 1 1 1 1 1 1 1 1 1 B B B H A A A H 2 2 2 B B B H A A A H 2 2 2 B B B H A A A H 2 2 2 C C C H H H H H X X X C C C H 3 3 3 H X X X C C C H 3 3 3 H X X X \$ \$ \$ H 3 3 3 H \$ \$ \$ </pre>	<p>47. Move 1:</p> <pre> \$ \$ \$ 1 1 1 1 1 1 1 1 1 B B B H A A A H 2 2 2 B B B H A A A H 2 2 2 B B B H A A A H 2 2 2 C C C H H H H H X X X C C C H 3 3 3 H X X X C C C H 3 3 3 H X X X \$ \$ \$ H 3 3 3 H \$ \$ \$ </pre>	<p>48-51. Move B,C,H,3:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ B B B H A A A H 1 1 1 B B B H A A A H 1 1 1 B B B H H H H H 1 1 1 C C C H H H H H 2 2 2 C C C H H H H H 2 2 2 C C C H H H H H 2 2 2 3 3 3 3 3 3 3 3 3 \$ \$ \$ </pre>
<p>52. Move X:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ B B B H A A A H 1 1 1 B B B H A A A H 1 1 1 B B B H H H H H 1 1 1 C C C H X X X H 2 2 2 C C C H X X X H 2 2 2 C C C H X X X H 2 2 2 3 3 3 3 3 3 3 3 3 \$ \$ \$ </pre>	<p>53. Move 3:</p> <pre> \$ \$ \$ H A A A H \$ \$ \$ B B B H A A A H 1 1 1 B B B H A A A H 1 1 1 B B B H H H H H 1 1 1 C C C H X X X H 2 2 2 C C C H X X X H 2 2 2 C C C H X X X H 2 2 2 3 3 3 3 3 3 3 3 3 \$ \$ \$ </pre>	<p>54-57. Move C,B,H,A:</p> <pre> \$ \$ \$ A A A A A A A A A B B B H B B B H B B B H C C C H H H H H 3 3 3 C C C H X X X H 3 3 3 C C C H X X X H 3 3 3 \$ \$ \$ H X X X H \$ \$ \$ </pre>	