Spatial Reasoning

• The ability to think in terms of spatial information, such as shape and orientation

• Includes
  – Regressing from image to 3D model
  – Representing a concept as a spatial model
  – Manipulating spatial models in the mind
Measuring Spatial Skill

Rotating

Options:
A
B
C
D
E
Measuring Spatial Skill

Folding
While wheel X turns round and round in the direction shown, wheel W turns
A. in direction A.
B. in direction B.
C. first in one direction and then in the other.
On a scale **from 1 to 10**, where 1 is non-spatial fields like singing and 10 is highly spatial fields like sculpture, how spatial is computing?

5 8 9 7 7½ 1 9 5 10
Spatial Reasoning in CS

- Correlation between HS spatial ability and career choice
Spatial Reasoning Matters

• Correlates with ability in many fields, including computing

• Correlation appears causative (increasing spatial reasoning skills has been shown to increase performance in related fields, including computing courses)
Why Does it Matter?

- Definitive answer not known
- Some ideas:
  - We teach concepts visually
    - Variables = boxes, addresses = arrows, ...
  - Computing terminology is visual
    - Stacks, trees, threads, flow, branching, nesting, lining up, moving, addresses, ...
Why, continued

- Challenge: find a **computing concept** that is **not visual** in terminology and that you can explain **without a spatial analogy**