

Aesthetics of Scale: Weaving Mathematically

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MathWeave

- A research group, based in Halifax, NS, Canada, that investigates the mathematics in textiles and the tangibility of mathematics.



Making Offers...

- Multiple approaches
- Interesting questions
- Opportunities to experiment
- Depth
- Variability
- Inspiration

Making with Rigour

- Requires accountability
- Situation-dependent

Variables and Change

- Manipulations have mathematical consequences
- Key concept: 'variable'
- Variants and invariants

Scale is an important variable

- Scaling highlights characteristics
- Each scale has many implications

Comparing Three Scales

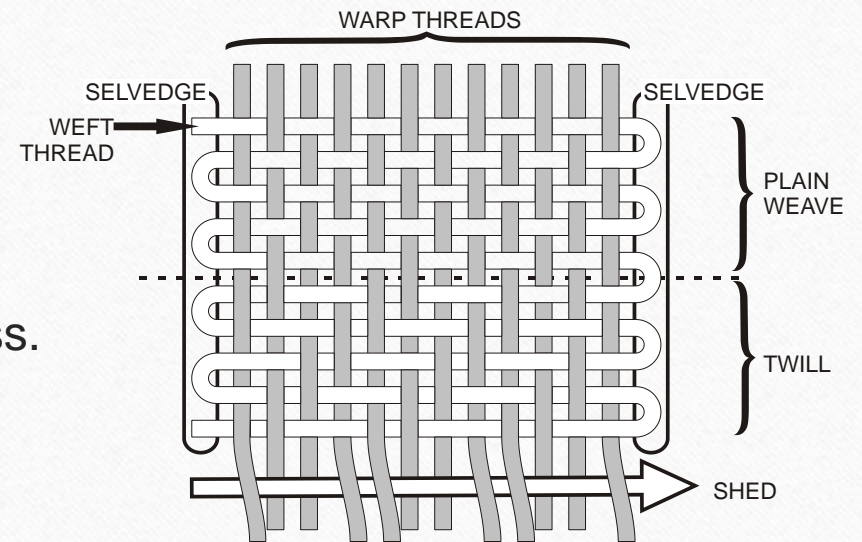
- Small – hand-held
- Medium – multiple workers
- Large – participants “are” the loom

Analysis and Assessment

- Emphasis on process
- Attention to:
 - patterns of movement and thought
 - mathematically salient features
 - potential variations
- Discussion

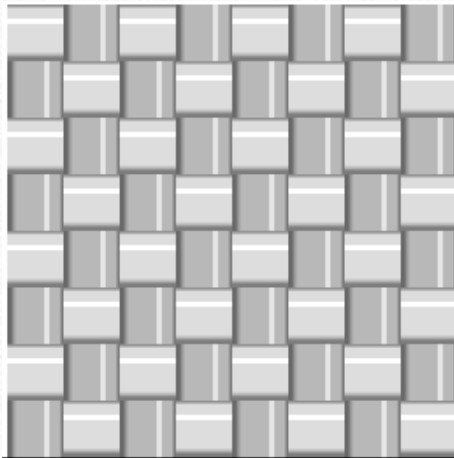
Weaving Terms

- **Warp** – the set of parallel strands (ends) held on the loom, usually under tension
- **Weft** – the strands that pass perpendicularly over and under the warp strands
- **Shed** – the space created between the lifted and unlifted warp strands
- **Selvage / Selvedge** – the edges parallel to the warp strands where the weft exits and re-enters the warp.
- **Interlacement / Weave** – the structural arrangement of the crossed warp and weft strands
 - **Plain weave** – the most basic weave: the weft crosses over one and under one warp end
 - **Twill weave** – the weft crosses over or under two or more warp strands, and the pattern shifts over by one warp end with each successive weft pass.



Weaves

Plain weave



Twill

