

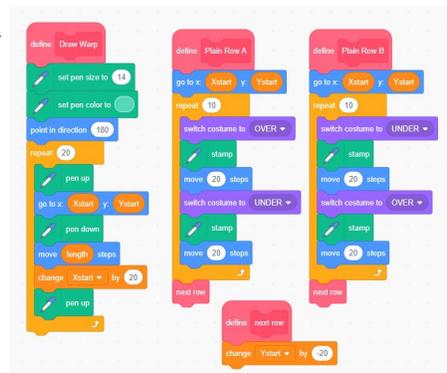
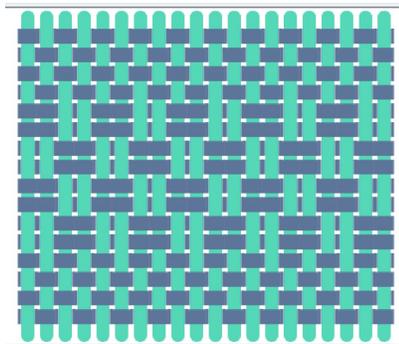
## Coding Weave Patterns in Scratch

Shared by: Diane Brancazio, MIT Edgerton Center K12 MakerLab Team

<b>Specialized tools/technology used:</b>	<b>Experience level required:</b>
Yarn, recycle cardboard Scratch coding platform <a href="https://scratch.mit.edu/">https://scratch.mit.edu/</a>	Intermediate

**Grade Level / Subject** (of this example): Technology 8, appropriate for grades 7 - 12

**Topic/Content Standards** (for this example): Coding / Computational thinking



Sample showing Plain Weave (top) -- Basket Weave (middle) -- Plain Weave (bottom)

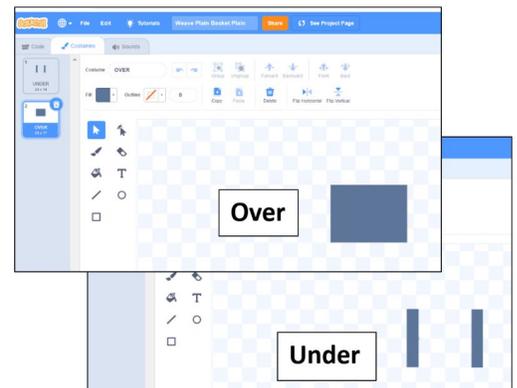
### Summary of Project:

Students practice computational thinking and coding concepts through weaving and pattern design. This activity followed a hands-on activity where students designed and wove their own fabric squares using yarn and cardboard looms, as an introduction to both weaving and coding concepts - see our *Weaving Patterns and Computational Thinking* adaptable project idea. In that activity students did some or all of the following:

1. determined the rules of various weave types
2. modeled the weaves on graph paper
3. created instructions/algorithms for selected weaves
4. created woven samples on cardboard looms

In this activity, students will code, test, and refine their weave algorithms on [Scratch](https://scratch.mit.edu/projects/387190963) using the starter code provided here <https://scratch.mit.edu/projects/387190963> (or make a simpler version of your own).

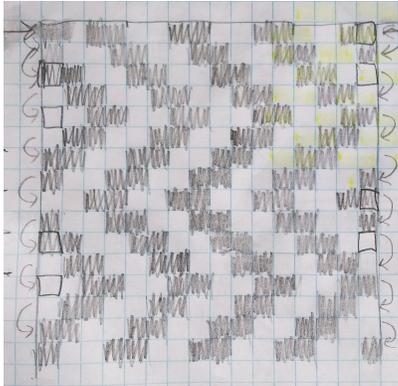
In our code we used the Pen function to create the Warp (columns) and the Stamp function to create the Weft using custom designed “Under” and “Over” costumes. The starter code demonstrates Plain and Basket weaves.



Students then design their own unique weave and adapt the code to model it on the computer.

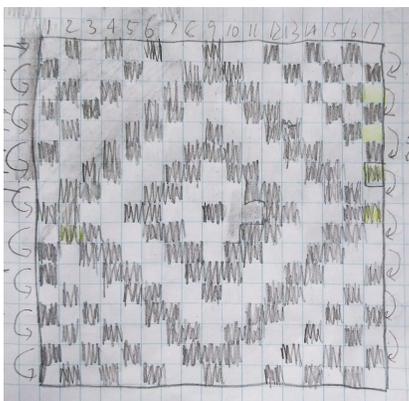
Some possible weave patterns:

Herringbone:



*Note: The graph paper models are useful in making edges (left and right) that will not unravel. Students can identify where the pattern goes Under → Under or Over → Over and change one of the stitches so the yarn is retained.*

Custom diamond:



## Resources and References

<https://www.heddels.com/2017/12/7-weave-patterns-to-know-twill-basketweave-satin-and-more/>

<https://www.canvasetc.com/what-is-twill/>

<https://www.theweavingloom.com/weaving-techniques-herringbone-weave/>

## Possible Content Extensions (with thanks to Diane Horvath, Medfield Middle School)

### Math

- Patterns: Weaving Inverse Operations and Multiples Patterns-
  - <http://mathinyourfeet.blogspot.com/2012/08/weaving-inverse-operations-multiples.html>
- Number Theory: Exploring the Coordinate Grid

### Mindfulness/Social-Emotional Learning

- As a community- outdoors *yarn bombing* project, create a weaving pattern in a fence or join several woven fabric squares together to wrap around a tree, pole, or bench.