

# **TinkerBlocks**

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Wellesley College

Principles of Programming Languages  
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# Wellesley College

Women's Undergraduate Liberal Arts College



# TinkerBlocks Team

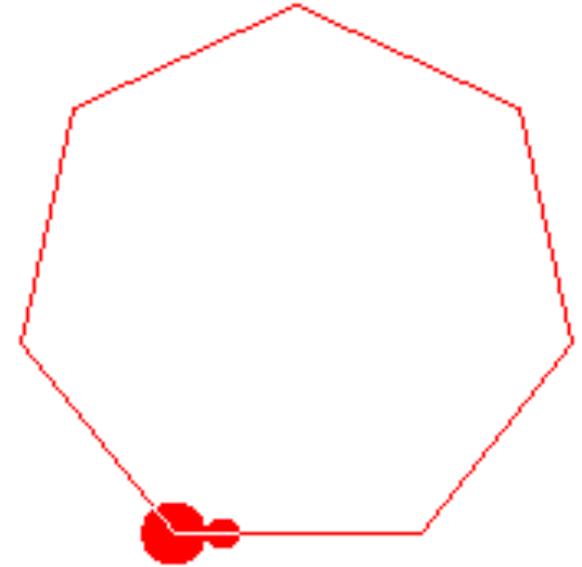
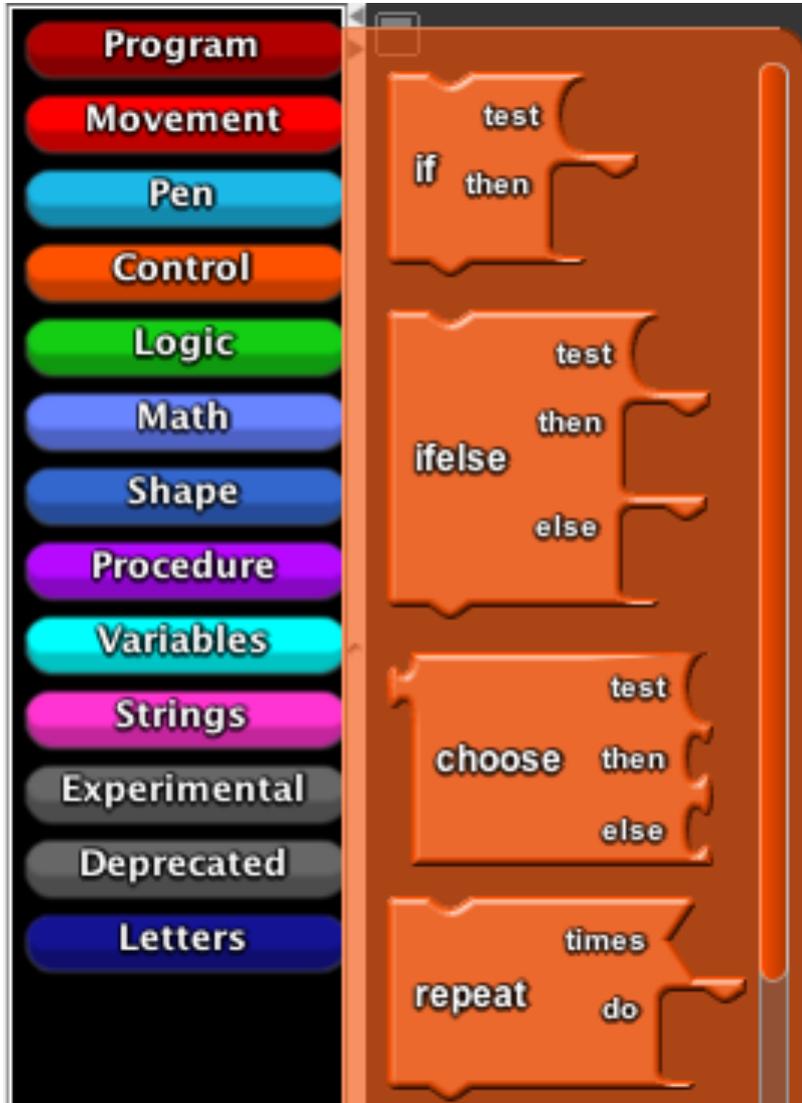


Lyn Turbak,  
Advisor



**Erin Davis**, Emily Erdman, Smaranda Sandu,  
Johanna Okerlund, Olivia Kotsopoulos,  
Marie Vasek, **Karishma Chadha**

# Blocks Languages



## TurtleBlocks



# Growing in Popularity



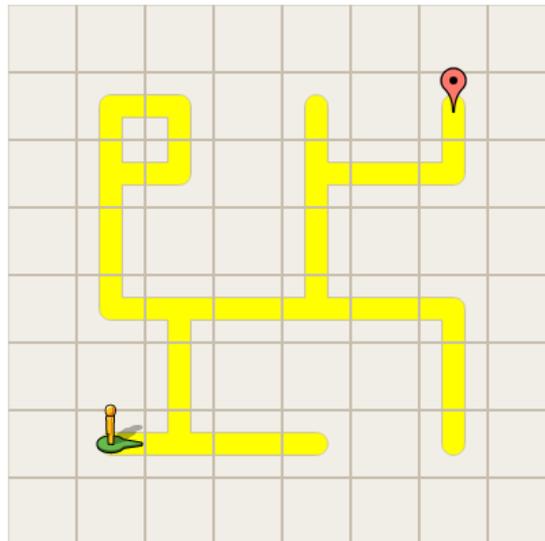
**Scratch:** multi-media programs, animations, and games  
Over **1 million registered users** and **3 million projects**  
uploaded to the community gallery



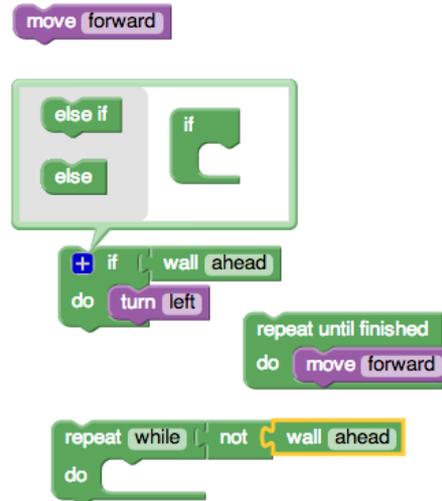
**MIT App Inventor:** apps for Android smartphones  
About **600,000 users** and **1.25 million projects**

**Blockly:** being developed as user PL for Google products

Blockly > Apps > Maze



Commands  
Logic



# TurtleBlocks

TurtleBlocks program



turtle drawing



cardstock

acrylic

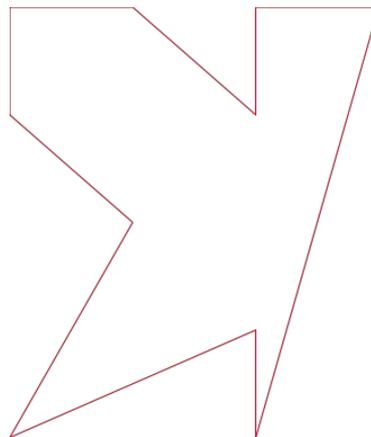
drawing boundary

# PictureBlocks

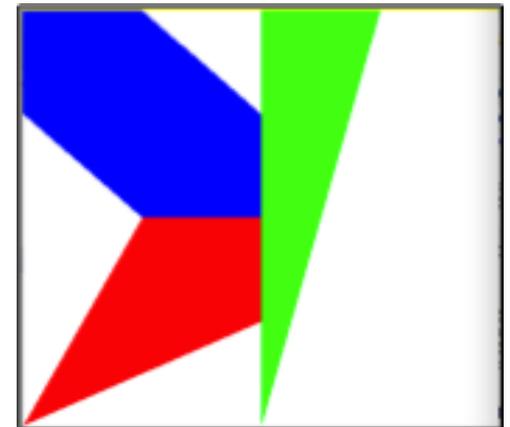
PictureBlocks program



wood artifact

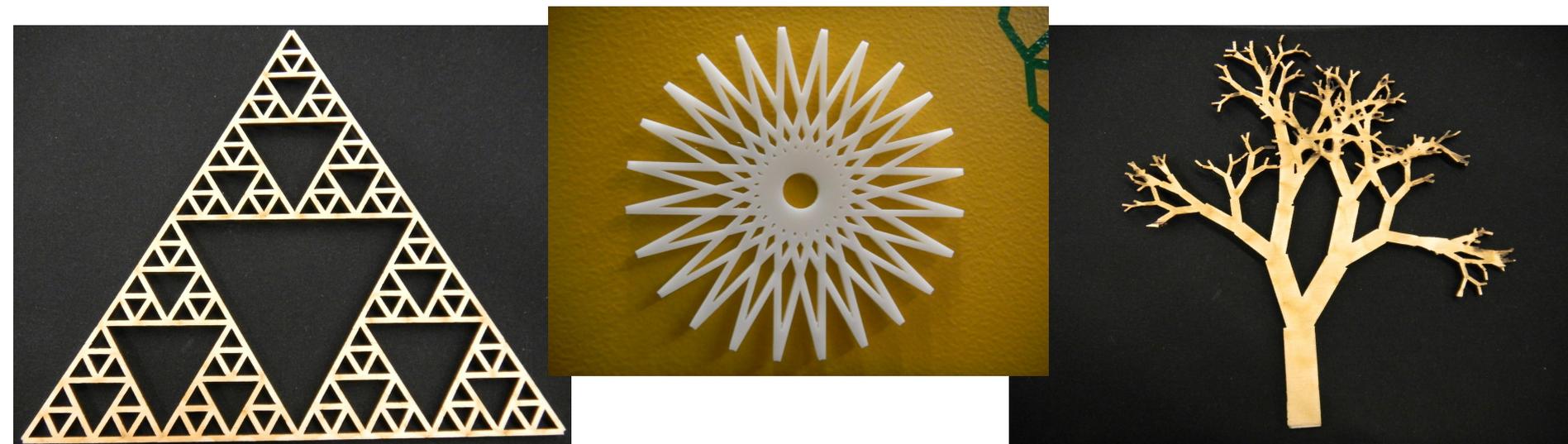
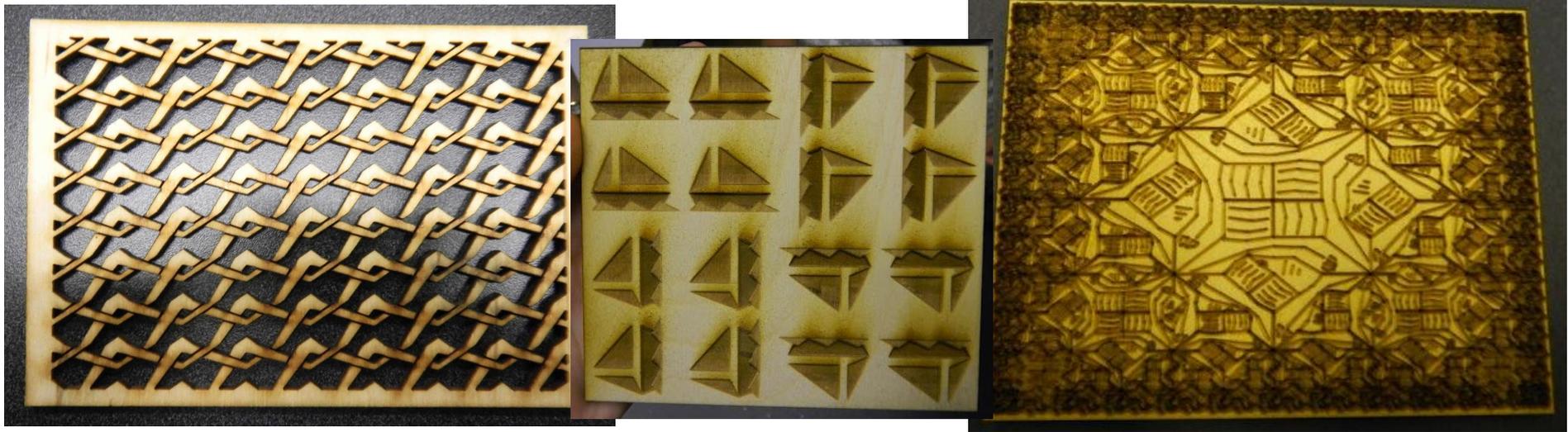


picture boundary



resulting picture

# Creating Artifacts



# Types by Shape



Number



Boolean



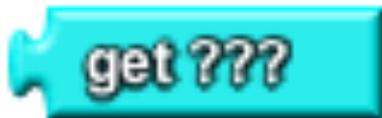
String



Picture

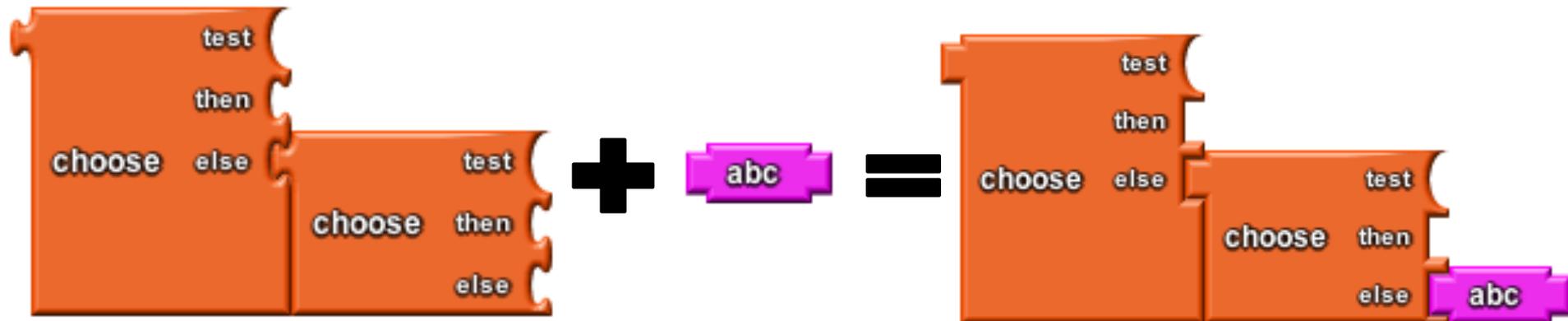
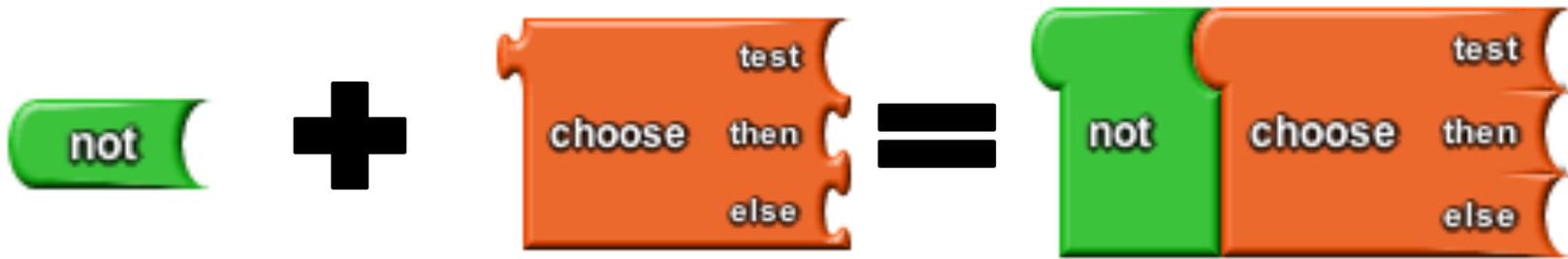
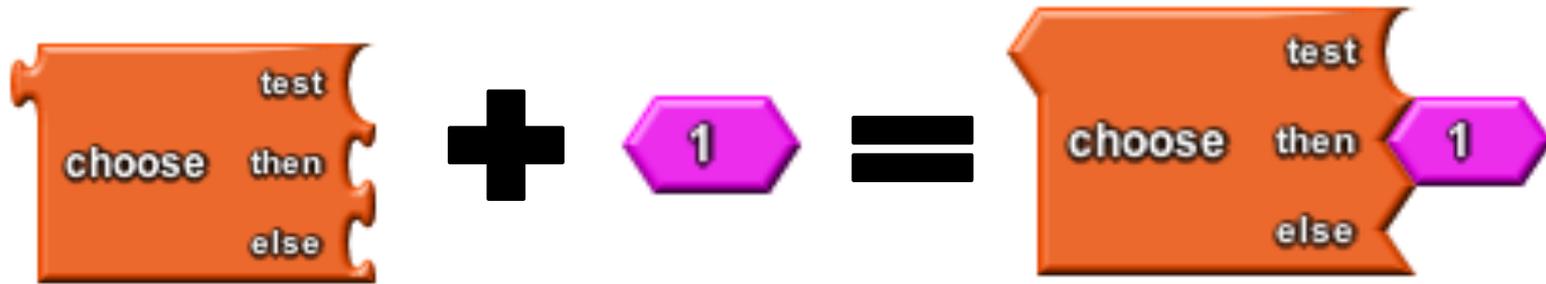


Color

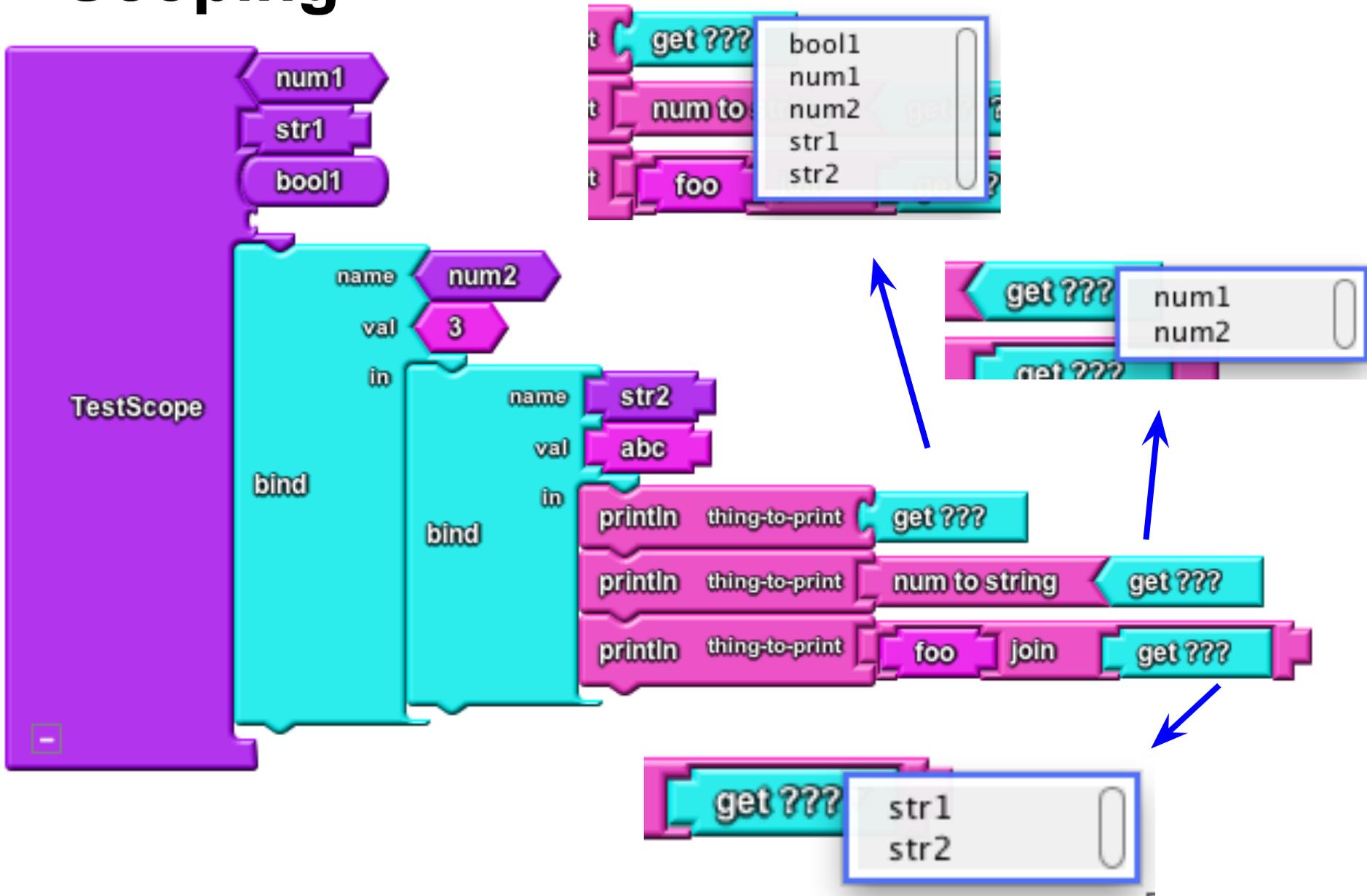


Polymorphic

# Polymorphism

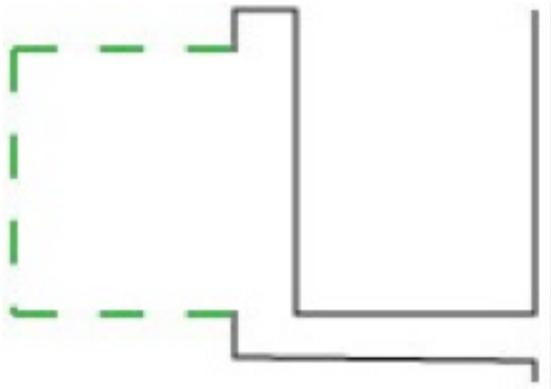


# Scoping

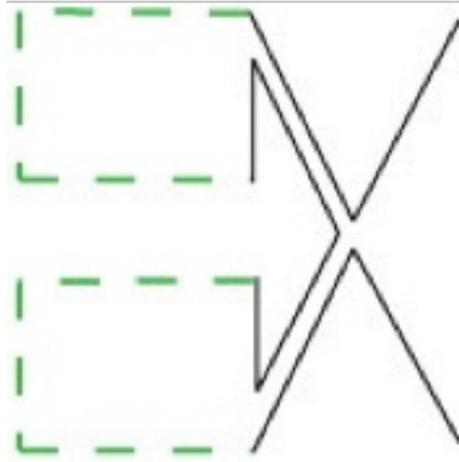


# Marie Vasek's TypeBlocks

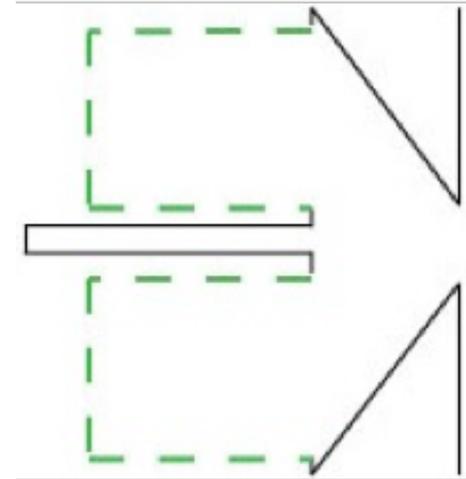
3 Constructors:



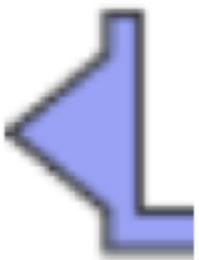
list



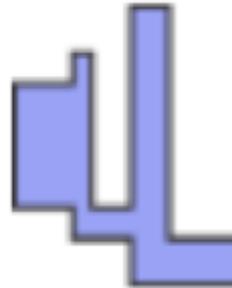
pair



function



int list



string list list



int \* string



bool -> string

# TypeBlocks Examples

[www.tinkerblocks.org/pubs](http://www.tinkerblocks.org/pubs)



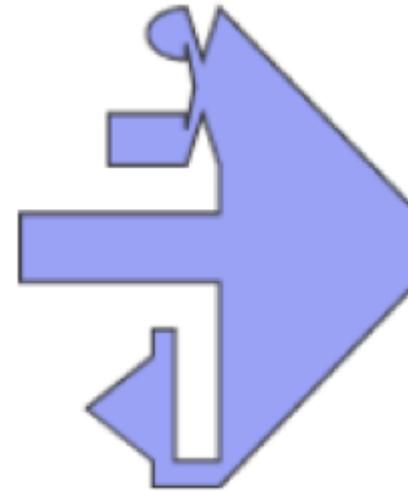
`(string * bool) list`



`(string list) * bool`



`bool * (string -> int list)`

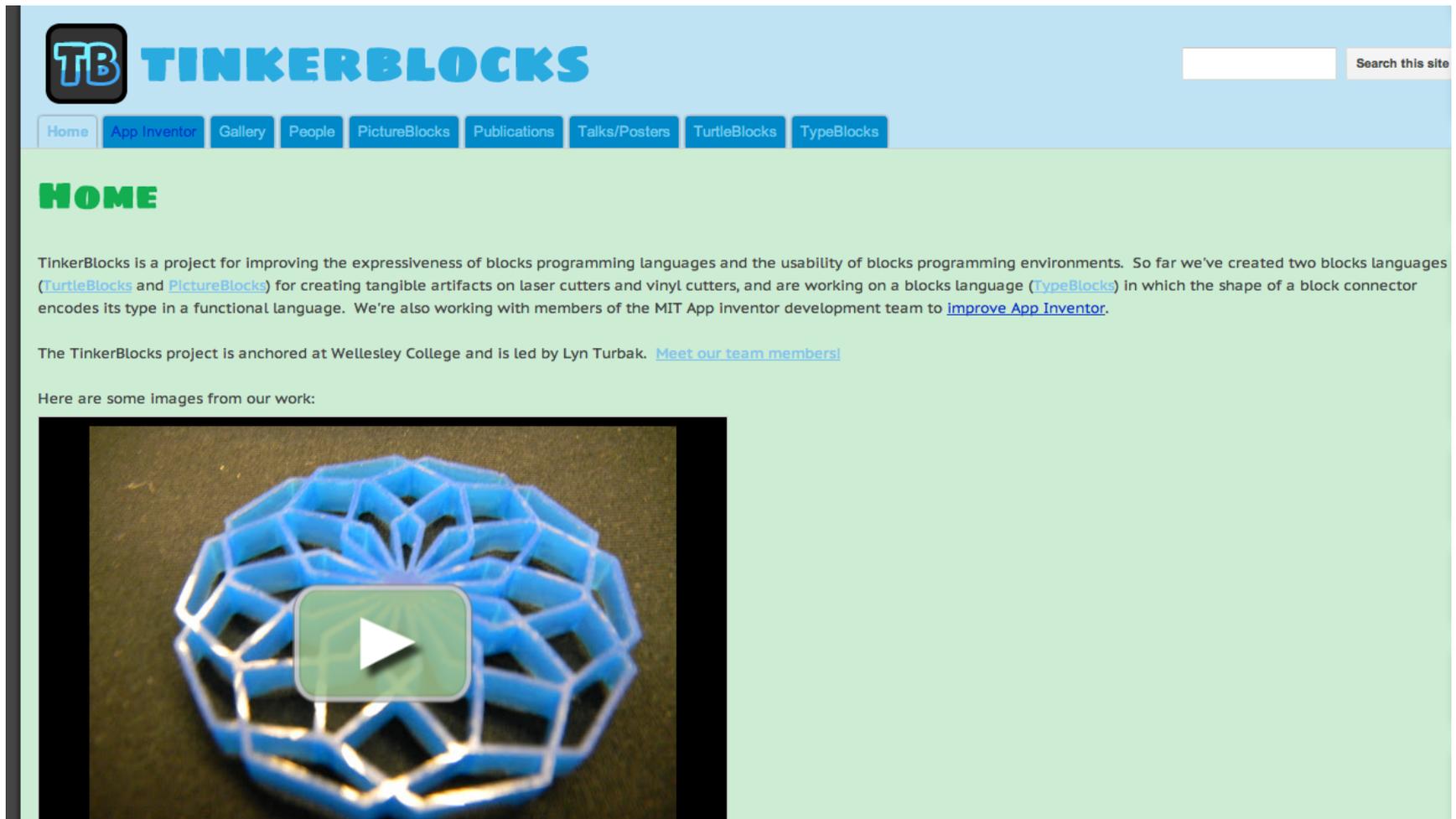


`(bool * string) -> (int list)`

# Questions?

More information at [www.tinkerblocks.org](http://www.tinkerblocks.org)

And you can see us for a demo!



The image shows a screenshot of the TinkerBlocks website homepage. At the top left is the logo, which consists of the letters 'TB' in a black square followed by the word 'TINKERBLOCKS' in blue. To the right of the logo is a search bar with the text 'Search this site'. Below the logo and search bar is a navigation menu with buttons for 'Home', 'App Inventor', 'Gallery', 'People', 'PictureBlocks', 'Publications', 'Talks/Posters', 'TurtleBlocks', and 'TypeBlocks'. The main content area has a green background and starts with the word 'HOME' in large green letters. Below this is a paragraph of text: 'TinkerBlocks is a project for improving the expressiveness of blocks programming languages and the usability of blocks programming environments. So far we've created two blocks languages ([TurtleBlocks](#) and [PictureBlocks](#)) for creating tangible artifacts on laser cutters and vinyl cutters, and are working on a blocks language ([TypeBlocks](#)) in which the shape of a block connector encodes its type in a functional language. We're also working with members of the MIT App Inventor development team to [improve App Inventor](#).' Below this paragraph is another line of text: 'The TinkerBlocks project is anchored at Wellesley College and is led by Lyn Turbak. [Meet our team members!](#)' At the bottom of the main content area, it says 'Here are some images from our work:' followed by a video player. The video player shows a blue, circular, geometric structure made of interconnected blocks, with a play button in the center.