Clipboard Quilts

A Computational Thinking Project

Introduction:

The earliest known papermaking took place in ancient China between 25 and 220 AD. Paper has been around for a very long time. It has been used for many things, from drawing up war plans, to writing love letters, to decorating the walls of the home. Did you know that paper can also be used to code? In this activity, you will use paper to design your own geometric block using squares and right-angle triangles. The paper block will be glued onto a clipboard to create a design of your choosing. This project is designed to give you hands on experience with the four aspects of Computational Thinking.

Computational Thinking is a thought process which can be used to solve many types of problems. Computational thinking is often associated with computers and coding, but it is important to know that Computational thinking can be used in many other areas including sewing and crafts. This method can help you to break down a problem into smaller pieces and simplify the problem into manageable steps. There are four parts to Computational Thinking.

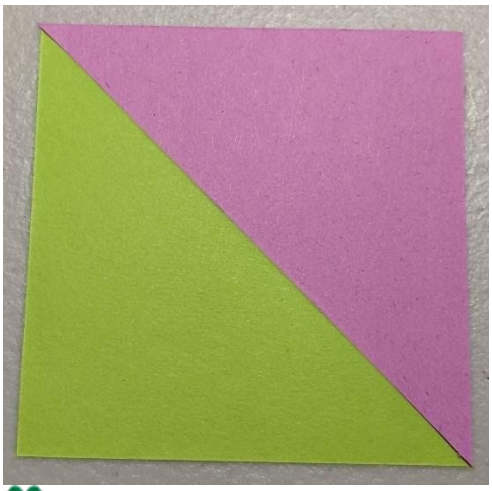
- Pattern Recognition – analyze and look for repeating sequences
- Decomposition – break the problem down into manageable pieces
- Abstraction – focus on important parts and remove unnecessary parts
- Algorithmic Thinking – use and create step-by-step directions to follow

Supplies in this kit:	Supplies to gather from home:
3 pieces of scrapbook paper (Paper A, B, C) Clipboard, glue stick, "mod podge", sponge paintbrush	Ruler, Scissors or paper cutter, clear tape, Pencil, Paper Plate or something to pour glue onto

Do:

- Cut the following pieces from the paper.
  - Paper A - cut (8) squares 2 inch, then cut in half diagonally to make (16) right angle triangles
  - Paper A – cut (4) squares 2 inch
  - Paper B - cut (8) squares 2 inch, then cut in half diagonally to make (16) right angle triangles
  - Paper B – cut (4) squares 2 inch
  - Paper C - cut (8) squares 2 inch

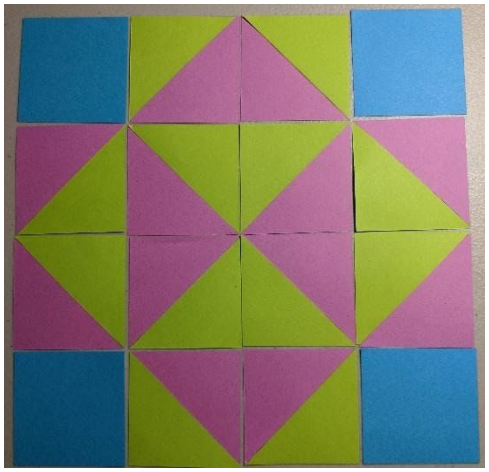
- Put the Paper A and Paper B (16) right angle triangles together to form a 2-inch square. Tape along the diagonal.



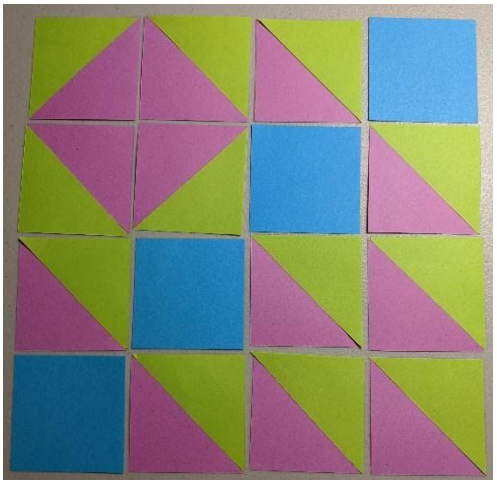
- Use these pieces to arrange a block that is 4 blocks wide by 4 blocks tall. You will have extra pieces, which can be used to make another design.

  You can create many different designs depending on how you orient and arrange your pieces. Play with the pieces and take pictures of each layout that you make. This will help you remember which layouts you like best. How many designs can you make? Two example designs below.

Symmetrical Design



Asymmetrical Design



- Once you have your favorite layout, prepare to glue the pieces onto the clipboard. Use a ruler to measure the clipboard and with a pencil draw some guidelines of where you want your block to be glued.
- Glue and arrange all the pieces to your geometric block. Tack the pieces of your design into place with the glue stick. This will help keep the pieces and block straight. You can use leftover paper or plain colored paper to decorate the areas around your quilt block if you want to. Make sure pieces are straight, glued tightly, and have no bubbles.
- Once the glue stick is dry, pour the Mod Podge onto a paper plate and use a sponge paintbrush to gently spread the Mod Podge thickly over your design. Make sure you spread the glue beyond the edges of the paper. If paper corners pull up, dab a little Mod Podge under the edges of the paper pieces. Gently smooth the design so there are no bubbles or lumps.

Clipboard made with white glue Mod Podge.

Clipboard made with

Reflect:

How did you use the parts of Computational Thinking in this project? Discuss the following questions with a teacher, leader, parent, or friend.

- How did you use Pattern Recognition to make this block?
  Did you create a pattern with the squares?
  Did any patterns repeat?
  How many quilt block designs did you make with your pieces?
  Could you have made more designs?
  Do you prefer symmetrical or asymmetrical designs?

- How did you use Decomposition to make this block?
  How did you break down the project from beginning to end?

- How did you use Abstraction to make this block?
  Which were the most important parts of this process?
  Where there any unnecessary parts to the process?

- How did you use Algorithmic Thinking?

Did you use step-by-step directions?

Apply:

- When have you used the four steps of Computational Thinking in school? In sewing? In crafts?
- How is knowing and understanding the four steps to Computational Thinking helpful?
- How can Computational Thinking help you to solve other problems or create new designs?
- Share your creations with us on social media: **#Utah4H #EngineerEverything #ClipboardQuilts**

Designed by: Debra Bore, 4-H Afterschool STEM Specialist, Deborah Taylor Ivie, Extension Assistant Professor