Computer Science Scavenger Hunt Activity

Objective: Students will be able to mimic the process for the 2018-19 Computer Science Scavenger Hunt MESA competition.

Task: Students will divide into two groups: Coders and Artists.

- Coders will create the code to recreate the pictures. Coders will answer any questions when the Artists are drawing
- Artists will solve cryptography questions while the Coders are coding. Artists recreate the picture by following the code exactly

Rules:

1. Only Code from Code.org is allowed
2. All movement must in by pixels
3. Turns will be in terms of common geometric angles (30, 45, 60, 90, 120, 135, 150, 180, 210, 225, 240, 270, 300, 315, 330, and 360). No radians.
4. "Move" command will draw a line. "Jump" command will not draw a line.
5. Artists are only allowed to ask Coders "Yes" or "No" questions. No other communication is allowed
6. The problem takes 1:30.
    a. 45 minutes for coding and solving cryptography
    b. 45 minutes for recreating the picture
7. Artists will NOT be allowed to use any help
8. No more than 2 people can be Artist

Materials (per team):

- Pencil (2)
- Protractor
- Cryptography questions (sample is attached)
- Ruler
- Blank paper
- Eraser (recommended but not necessary)
- Picture (sample is attached)
- Blank graph paper
- Timer (https://www.online-stopwatch.com/)

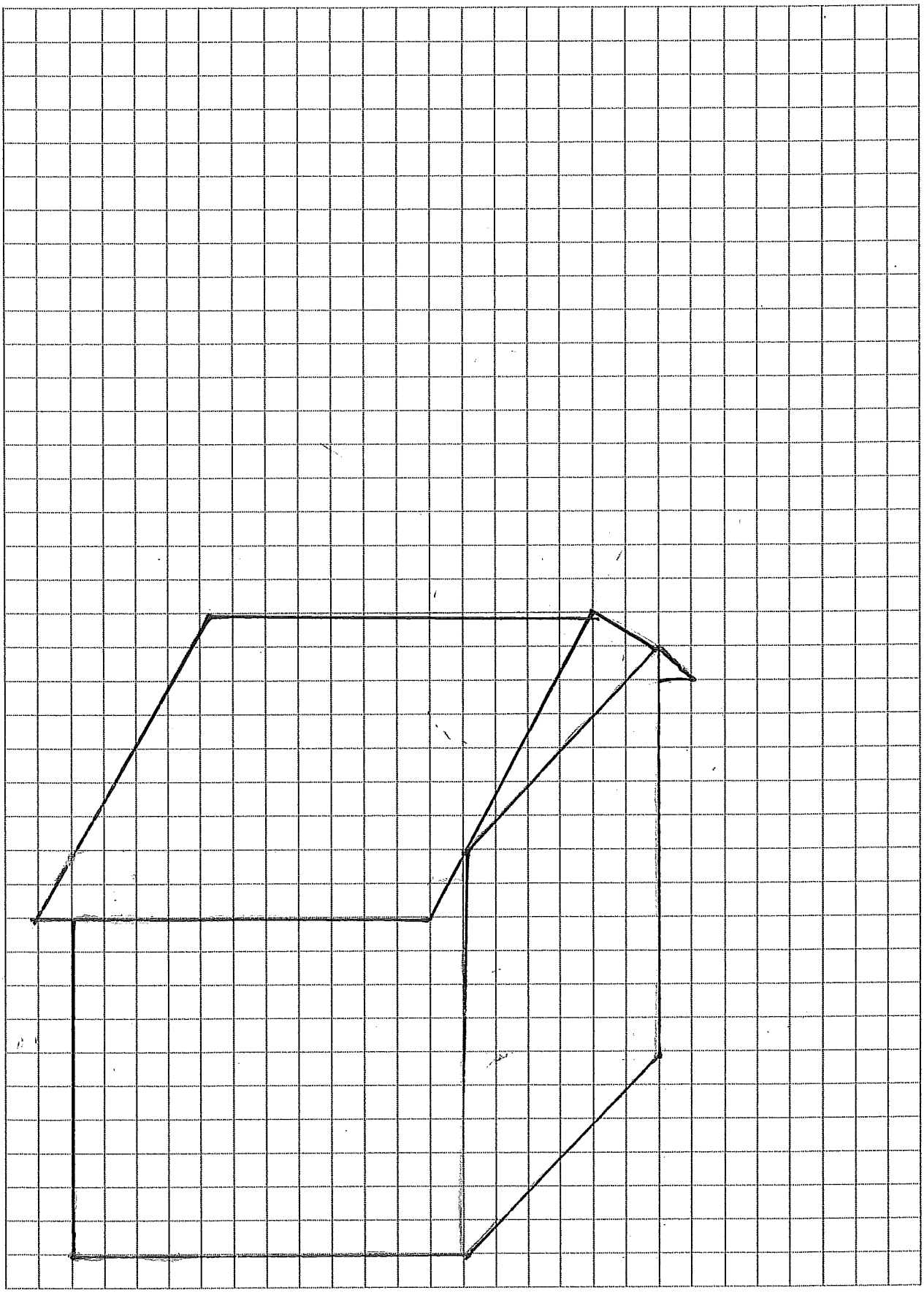
Introduction: Tell students this is how the Computer Science Scavenger Hunt activity will run at MESA Day. This is a great way for them to practice their skills. Divide the team into Coders and Artists. Separate the team into opposite sides of the room.

Procedure: Give the Coders the picture, pencil, ruler, and protractor. Give the Artists pencil and cryptography questions. Start the timer. When the time has expired, collect the picture and the code. Give the Artists the blank graph paper, code, ruler, and protractor. Start the timer. When the Artists are done, have them hold up their picture. Record the time it takes for them to complete the picture.

Check the cryptography questions. The answer are either correct or incorrect. No partial credit.

Have the team compare the original picture to the created picture. Have the team discuss any difficulties and problems understanding the code.

Closure: Have the students decide how they can approach this problem and what problems they encountered. Have them brainstorm how they can overcome these difficulties.



Cryptography Questions

1. Encode the following using a Caesar cipher with shift key **8.**

   Text: I LOVE MESA

2. Decode the following using a Caesar cipher with shift key **2**.

   Text: EQORWVGTUEKGPEG

3. Encode the following using an Additive cipher with shift key **3.**

   Text: Saturdays with MESA are fun

4. Decode the following using an Additive cipher with shift key **9.**

   Text: 10 17 20 20 09 22 12 21 09 22 22 07 09 00 13 09 05 13 01 23 21 13

Cryptography Answers

1. QTWDMUMAI
2. COMPUTER SCIENCE
3. 21 03 22 23 20 06 03 01 21 25 11 22 10 15 07 21 03 03 20 07 08 23 16
4. Bill and Manny are awesome