Name ____________________________________

Summer Math Project – 2023

It is important to practice our math skills over the summer months. It is also important to spend some time relaxing, being with family and enjoying the warm weather.

Therefore, instead of a packet of pages of problems, I would like each family to spend 1 day each month (June, July and August) exploring math concepts.

June: Optical Illusions

1. Check out the examples on the page. Look up more in books or websites. What kinds of patterns and geometric figures do you notice?
2. Time to create! Make your own. Compare with your other family members. Challenge each other!

July: Ice Cream Scoops

1. Have a treat night with your family – go get ice cream or gelato!
2. Check out the page about possible combinations of ice cream flavors. Draw picture, make charts or show your work in equations.

August: How Close to 100?

1. Play a game with your family. Find a game in your house that has 2 6-sided dice. Borrow those for step 2!
2. Play the How Close to 100? three times.

Finally, enjoy your summer!

Mrs. Ensminger

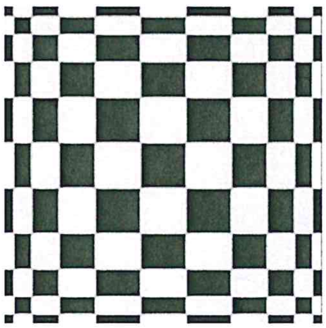
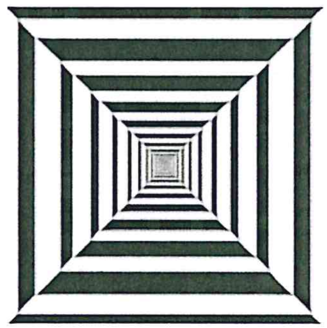
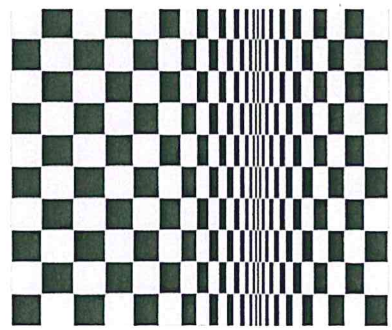
Mrs. Shaw

Return your packet to your Math teacher by Friday, September 8

Optical Art

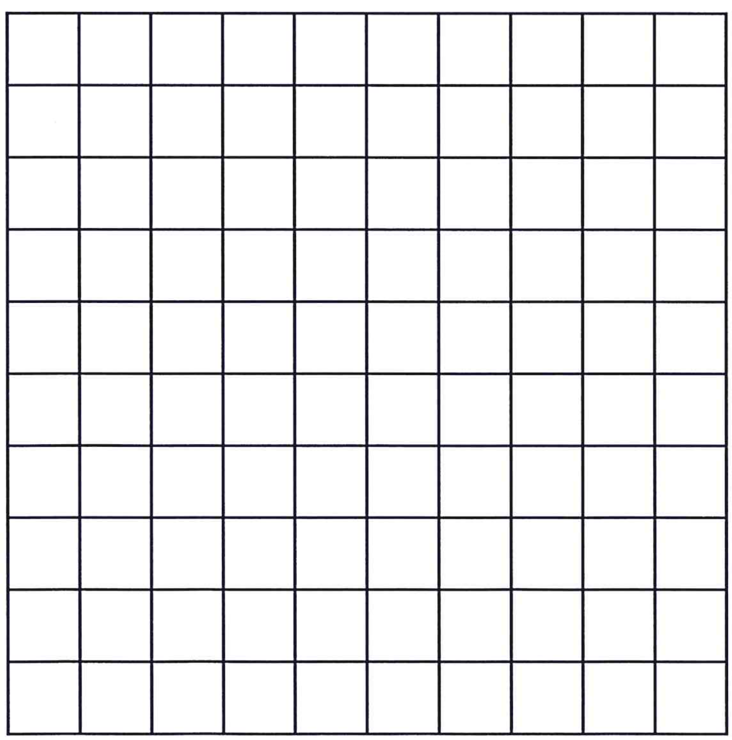
Submitted by Jo Boaler, Michael Jarry-Shore & Cathy Williams

Optical art consists of geometric shapes and patterns, and is often coloured in black and white. This type of art creates illusions, leaving the viewer with the impression that objects are moving, vibrating, pulsating, or warping. Some examples of optical art are given below.

Look at the 3 examples, do you see anything about the patterns that cause them to create an optical illusion?

Using the 100-square grid below, create your own interesting pattern. It may help to use a ruler and it is a good idea to experiment with different designs; doing your best to create a piece of optical art that creates an illusion. Share your designs with a classmate and find out if they see an illusion when looking at your pattern. Experiment with breaking the squares in the grid into triangles, rectangles, and other shapes.



Optical Art

Did you get any more ideas about the ways to create an optical illusion? Describe your mathematical thinking about ways to do that.

Can you see any patterns, fractions, or decimals in your art work? Where are they?

Think of a mathematical question that you could ask about your art work, that you can give to a friend. Ask your friend your question, and ask them to justify their answer – giving clear reasons for the methods and solutions they come up with.

If someone else wanted to recreate your art work, what directions would you give them? Give precise mathematical statements so that someone could recreate your art without looking at it.

Optical Art

Ice Cream Scoop

In shops with lots of ice-cream flavors there are many different flavor combinations, even with only a 2-scoop cone. With 1 ice-cream flavor there is 1 kind of 2-scoop ice cream, but with 2 flavors there are 3 possible combinations (eg vanilla/vanilla, chocolate/chocolate, and vanilla/chocolate).

- How many kinds of 2-scoop cones are there with 10 flavors?

Below, show your thinking with words, pictures and numbers.

How Close to 100?

- This game is played in partners. Two people share a blank 100 grid.

- The first partner rolls two number dice.

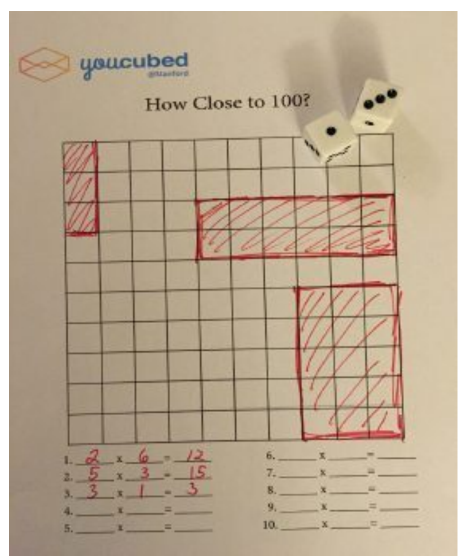
- The numbers that come up are the numbers the player uses to make an array on the 100 grid.   Example: Roll a 3 and 4. You can fill in a rectangle that is 3x4 or another set of factors that also = 12. You could also fill in 2x6 or 1x12 rectangles. What is your best move?

- They can put the array anywhere on the grid, but the goal is to fill up the grid to get it as full as possible.

- After the player draws the array on the grid, she writes in the number sentence that describes the grid.

- The second player then rolls the dice, draws the number grid and records their number sentence.

- The game ends when both players have rolled the dice and cannot put any more arrays on the grid.



How close to 100 can you get?

youcubed
at Stanford University

How Close to 100?

1. ________ x ________ = ________
2. ________ x ________ = ________
3. ________ x ________ = ________
4. ________ x ________ = ________
5. ________ x ________ = ________
6. ________ x ________ = ________
7. ________ x ________ = ________
8. ________ x ________ = ________
9. ________ x ________ = ________
10. ________ x ________ = ________

youcubed at Stanford University

How Close to 100?

1. ________ x ________ = ________
2. ________ x ________ = ________
3. ________ x ________ = ________
4. ________ x ________ = ________
5. ________ x ________ = ________
6. ________ x ________ = ________
7. ________ x ________ = ________
8. ________ x ________ = ________
9. ________ x ________ = ________
10. ________ x ________ = ________

youcubed
at Stanford University

How Close to 100?

1. ______ x ______ = ______
2. ______ x ______ = ______
3. ______ x ______ = ______
4. ______ x ______ = ______
5. ______ x ______ = ______
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