How 3D and holograms are related to mathematics?

I. 3D

1. What is 3D projection?

What does 3D mean, and who is its father?

- 3D is a three-dimensional form or appearance and its concept of extending 2D geometry to 3D
- Heron is the father of 3D

What is 3D projection?

- 3D Projection is the basis of the concept for Computer Graphics simulating fluid flows to imitate realistic effects.

2. How is 3D related to mathematics?

- 3d printing - natural extension of drawing in two dimensions is drawing in three dimensions. In this direction, we have been using 3D printing as an aid to visualising mathematical objects. We design sculptures that help us and others to understand the mathematics better. Also, these sculptures are beautiful in their own right!

Where do we use 3D?

- ✓ Stereometry
- ✓ 3D printing
- ✓ 3D Computer graphics
- ✓ 3D film
- ✓ 3D modeling
- ✓ 3D television

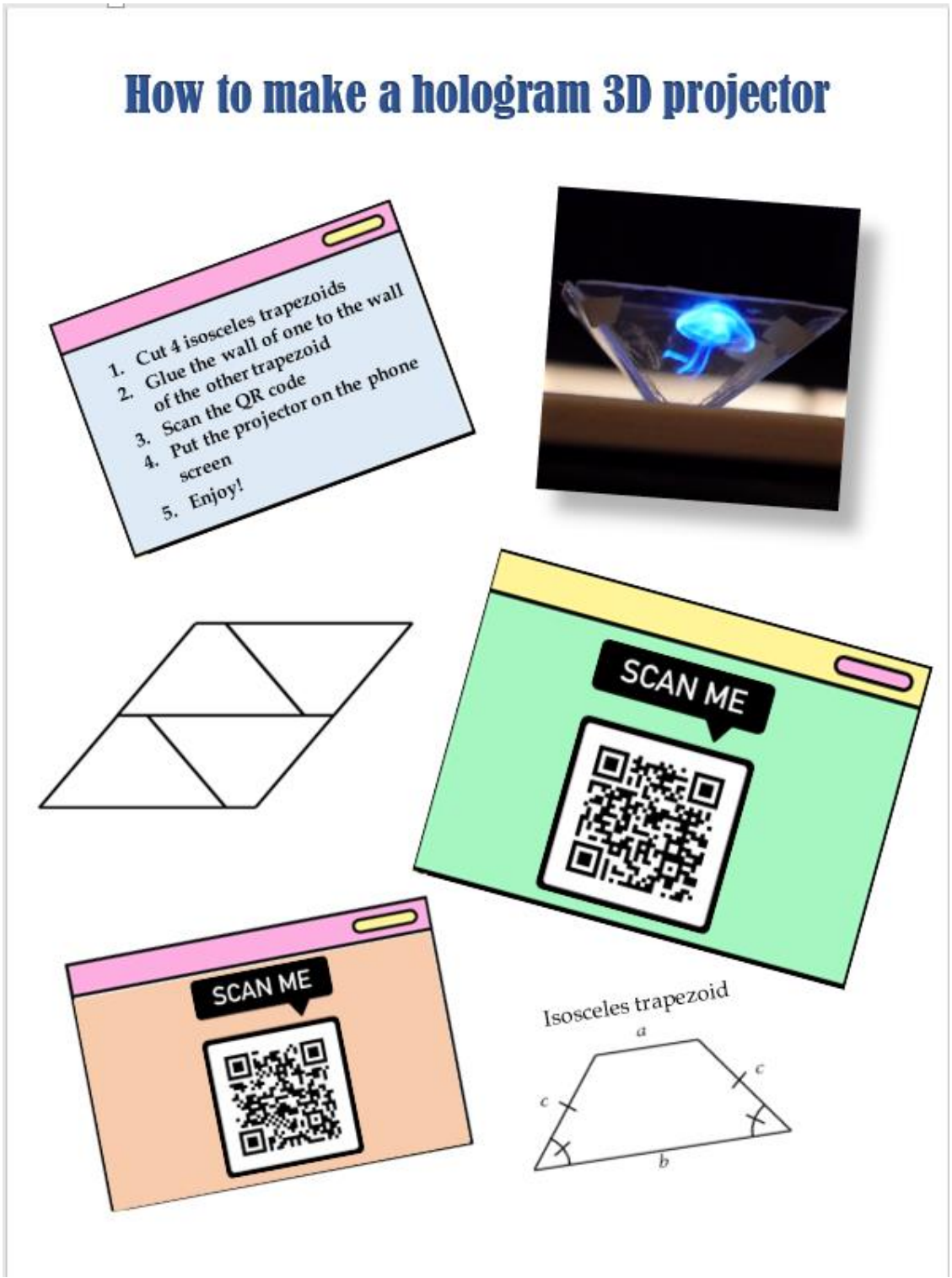
II. Holograms

1. What is a hologram?

- Hologram is a three-dimensional image formed by the interference of light beams from a laser or other coherent light source on two dimensional space
- Dennis Gabor - father of holography

*Interference of light is the phenomena of multiple light waves interfering with one another under certain circumstances, causing the combined amplitudes of the waves to either increase or decrease.

2. ***How are holograms related to mathematics?***
   - Complex Numbers
   - The actual mathematics behind the hologram is quite complex, literally. The light wave used for recording as well as for reconstructing can be modeled using Complex Numbers. The complex numbers, in this case, represent the electric or magnetic field of the light wave.



3. ***How do scratch holograms work?***
   - They are not real holograms.
   - The image you see on them is an optical illusion. It is due to the reflection o flight in the scratches you will make on Plexiglas plate or CD.
   - These scratches are parts of circles.