

TWO DIMENSIONAL DESIGN

CHAPTER 4: STRUCTURE

Dr. Hatem Galal A Ibrahim

Most designs have a structure. Structure is to govern the positioning of forms in a design.

Why is one group of unit forms displayed in a row and adjacent from one another?

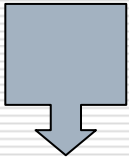
DEFINITION

Why does another group of unit forms suggest a circular pattern?

Structure is the underlying discipline for such arrangements.

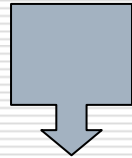
Structure generally imposes order and predetermines internal relationships of forms in a design.

GROUP 1



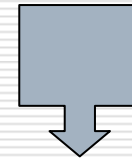
FORMAL

GROUP 2



INACTIVE

GROUP 3



INVISIBLE

TYPES OF STRUCTURE

SEMI-FORMAL

ACTIVE

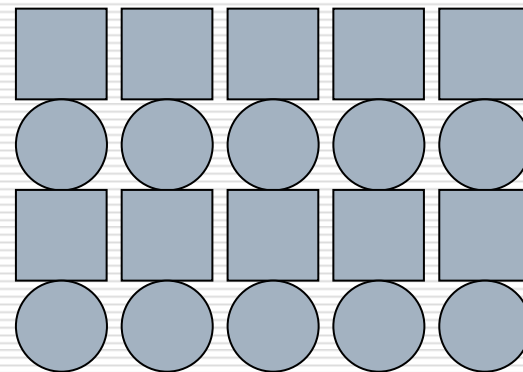
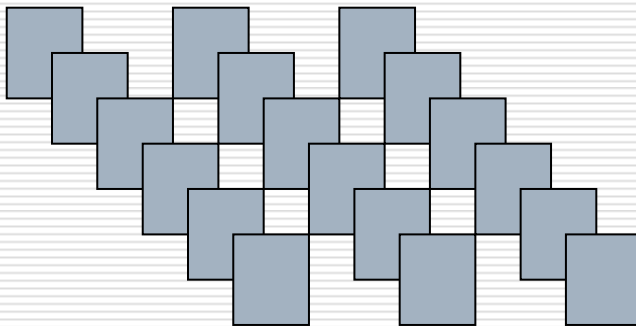
VISIBLE

INFORMAL

GROUP 1

FORMAL STRUCTURE:

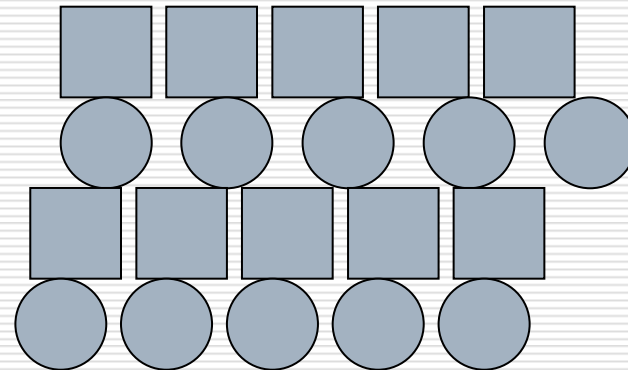
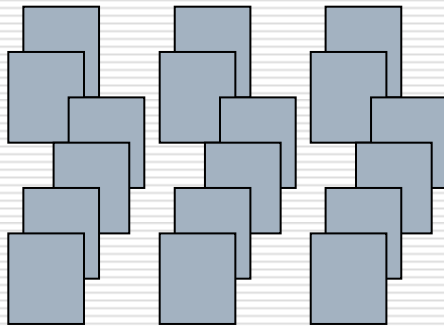
It consists of structural lines which are constructed in a rigid, mathematical manner. The structural lines are to guide the entire formation of the design. Space is divided into a number of subdivisions equally or rhythmically, and forms are organized with strong sense of regularity.



GROUP 1

SEMI-FORMAL STRUCTURE:

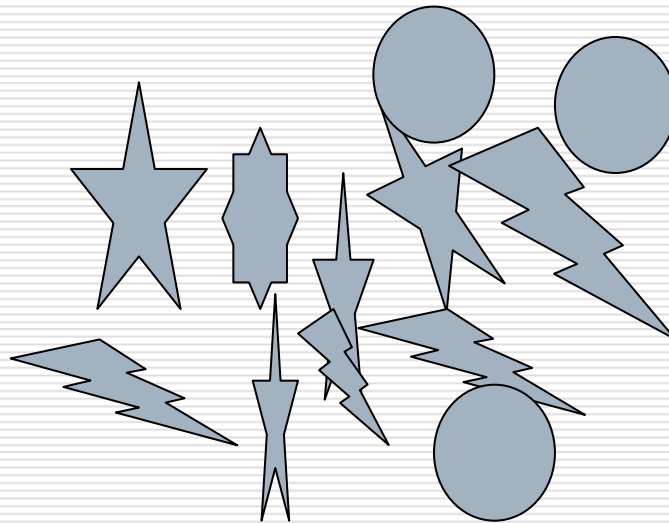
It is usually quite regular, but slight irregularity exists. It may or may not consist of structural lines to determine the arrangement of unit forms.



GROUP 1

INFORMAL STRUCTURE:

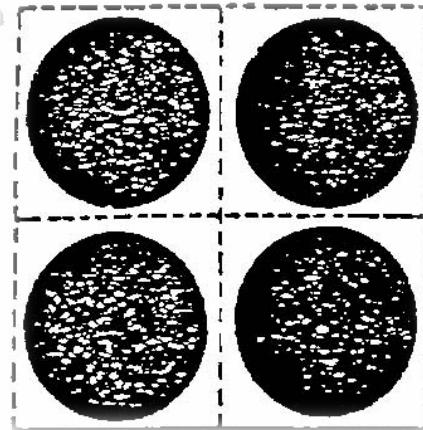
It doesn't normally have structural lines. Organization is generally free and indefinite.



GROUP 2

INACTIVE STRUCTURE:

It consists of structural lines which are purely conceptual. Such structural lines are constructed in a design to guide the placement of forms or unit forms, but they never interfere with their shapes nor divide the space up into distinct area where color variations can be introduced.



GROUP 2

ACTIVE STRUCTURE:

It consists of structural lines which are also conceptual. The active structural lines can divide the space up into individual subdivisions which interact with unit forms.

IT CAN BE VARIED IN DIFFERENT WAYS

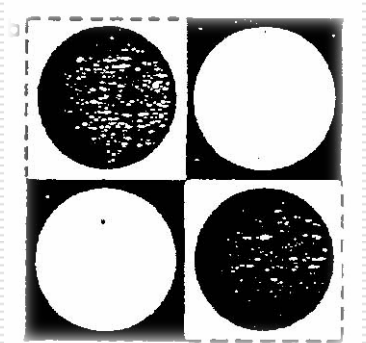
GROUP 2: ACTIVE STRUCTURE:

* The structural subdivisions provide complete spatial independence for the unit forms.

* Each unit form exists in isolation, as if it had its own small formal reference.

* It can have a ground of different color from that of its neighboring unit forms.

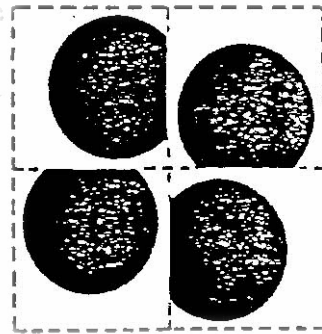
* Alternate, systematic, or random play of positive and negative forms can be introduced effectively.



GROUP 2: ACTIVE STRUCTURE:

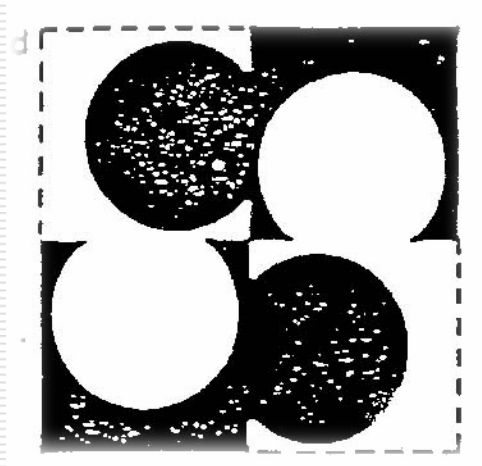
* Within the structural subdivisions, each unit form can move to assume various off-center positions.

* It can even slide partially beyond the area defined by the structural subdivision. When this happens, the portion of the unit form that is outside the confines are clearly marked by the active structural lines may be cut off.



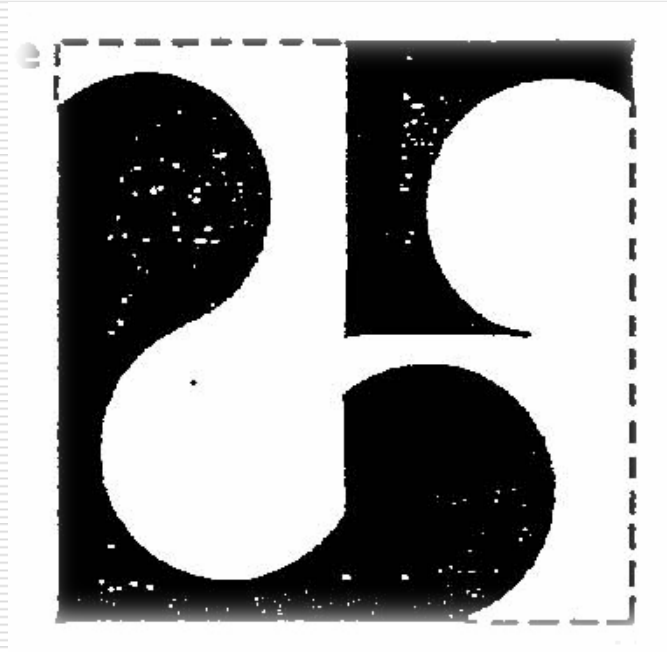
GROUP 2: ACTIVE STRUCTURE:

When the unit form introduces into the dominion of an adjacent structural subdivision, this situation can be regarded as the encounter of two forms (the unit form and its adjacent structural subdivision), and penetration, union, subtraction, or intersection can take place as desired.



GROUP 2: ACTIVE STRUCTURE:

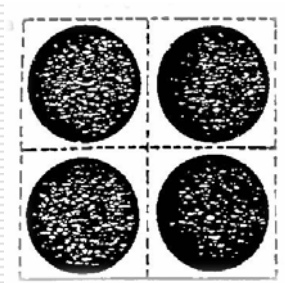
Space isolated by a unit form in a structural subdivision can be united with any unit form or structural subdivision nearby.



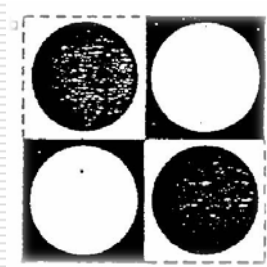
GROUP 3

INVISIBLE STRUCTURE:

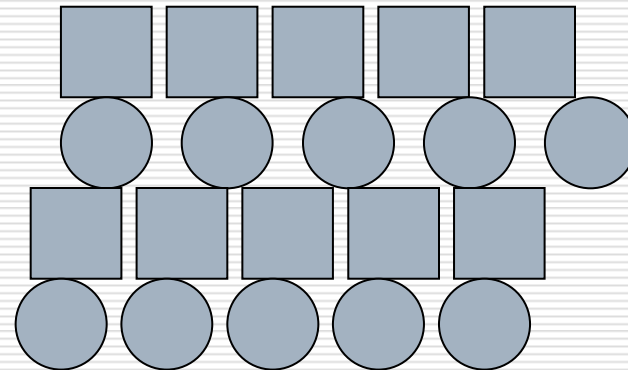
In most cases, structures are invisible, whether formal, semi-formal, informal, active or inactive. In invisible structures, structural lines are conceptual, even though they may slice a piece off from a unit form. Such lines are active but not visible lines of measurable thickness.



inactive



active



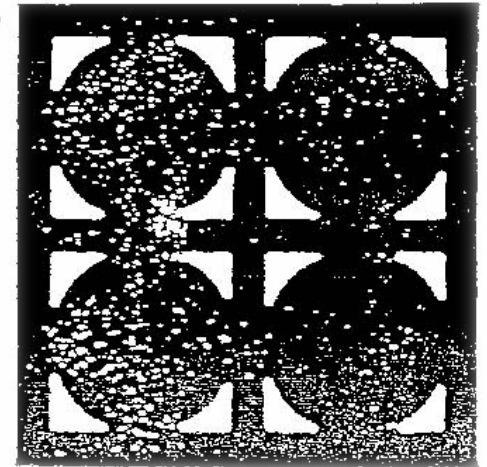
Semi-formal

GROUP 3

VISIBLE STRUCTURE:

Sometimes, a designer may prefer a visible structure. This means that the structural lines exist as actual and visible lines of desired thickness.

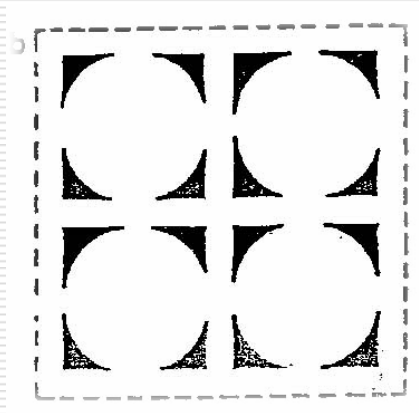
Such lines should be treated as a special kind of unit form because they possess all the visible elements and can interact with the unit forms and the space contained by each of the structural subdivisions.



GROUP 3: VISIBLE STRUCTURE:

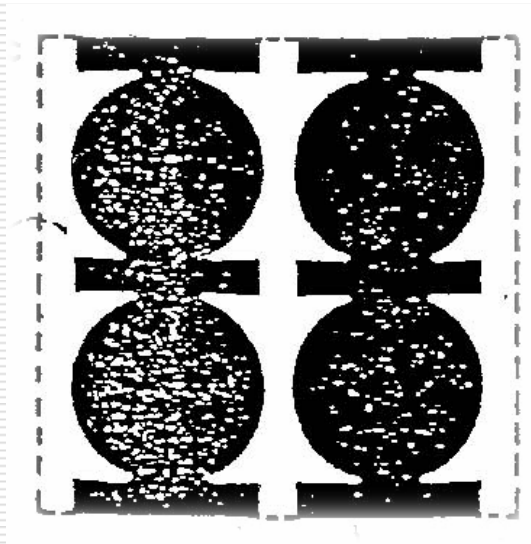
Negative visible structural are united with negative space or negative unit forms, and they can cross over positive space or positive unit forms.

Negative structural lines are considered as visible because they have a definite thickness which can be seen and measured.



GROUP 3: VISIBLE STRUCTURE:

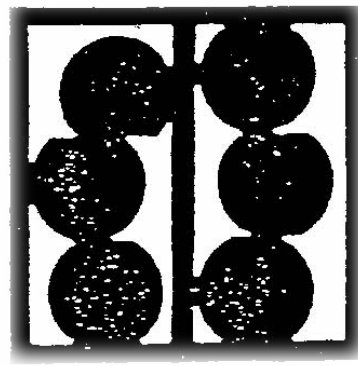
Positive and negative visible structural lines can also be used in combination in a design. For example, all horizontal structural lines can be positive, all vertical structural lines negative.



GROUP 3: VISIBLE STRUCTURE:

Visible and invisible structural lines can also be used together. This means we can have only the verticals or the horizontals visible.

We can also have visible and invisible lines to be used alternately or systematically.



When unit forms are positioned regularly, with an equal amount of space surrounding each of them, they may be said to be in a repetition structure.

REPETITION STRUCTURE

The repetition structure is the simplest of all structures. It is particularly useful in the construction of all-over patterns.

*** THE BASIC GRID**

*** MULTIPLE REPETITION STRUCTURES**

REPETITION STRUCTURE MAY APPEAR IN SOME WAYS

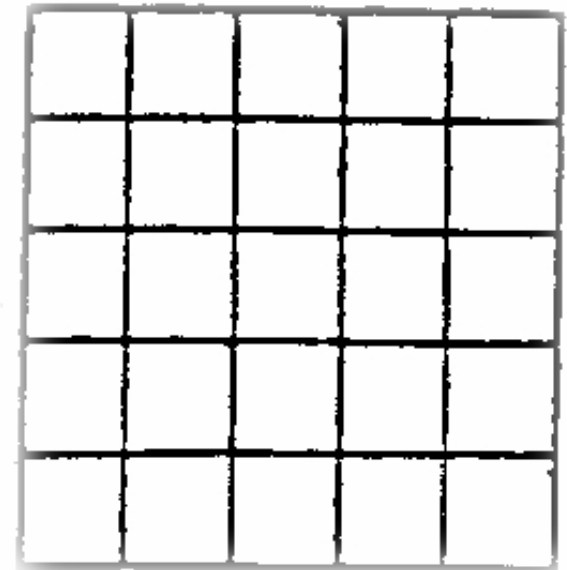
*** UNIT FORMS AND STRUCTURAL SUBDIVISIONS**

*** REPETITION OF POSITION**

*** SUPERIMPOSITION OF REPETITION STRUCTURES**

* THE BASIC GRID:

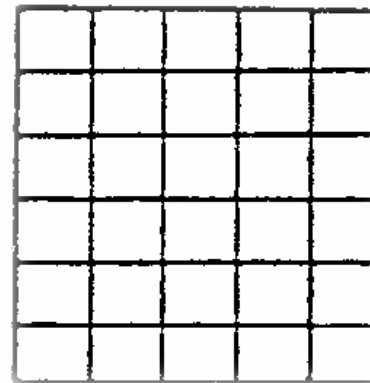
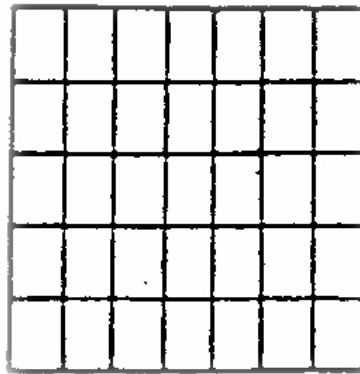
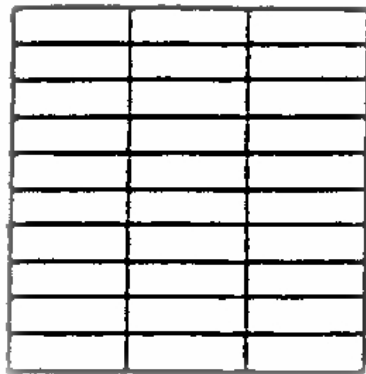
- It is the most frequently used in repetition structure.
- Consists of equally spaced vertical and horizontal lines crossing over each other, resulting in a number of square subdivisions of the same size.
- The basic grid provides each unit form the same amount of space above, below, left and right.



VARIATIONS OF THE BASIC GRID:

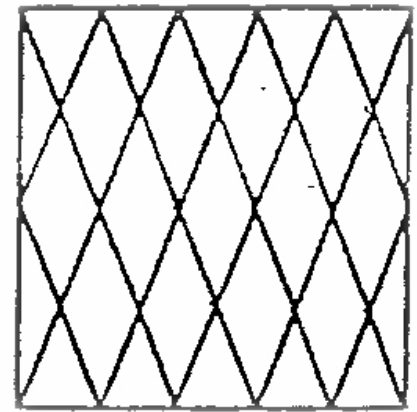
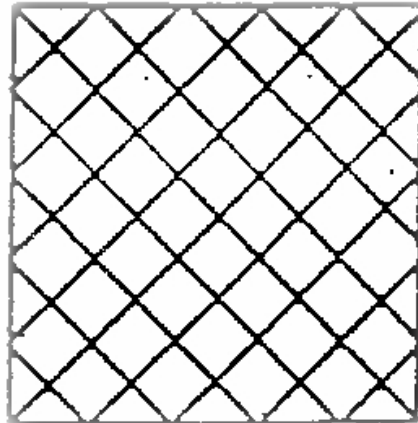
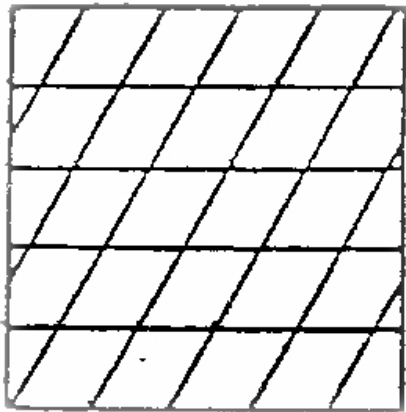
CHANGE OF PROPORTION

The square subdivisions of the basic grid can be changed into rectangular ones. The balance the vertical and the horizontal directions is thus transformed, and the direction gains greater emphasis.



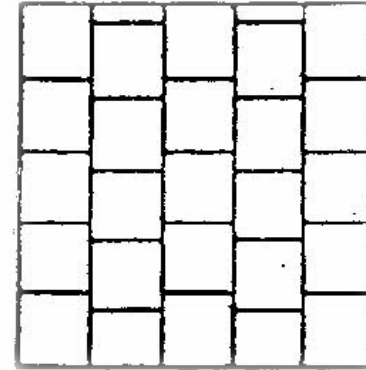
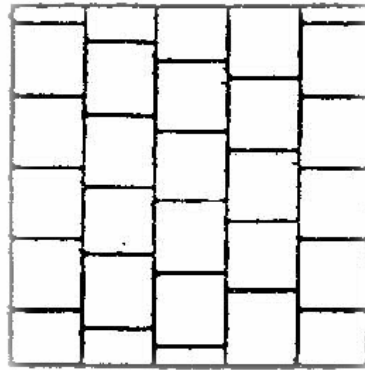
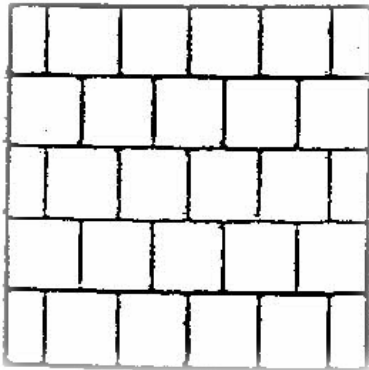
CHANGE OF DIRECTION

All the vertical or horizontal lines, or both, can be tilted to any angle. Such diversion from the original vertical-horizontal stability can provoke a sense of movement.



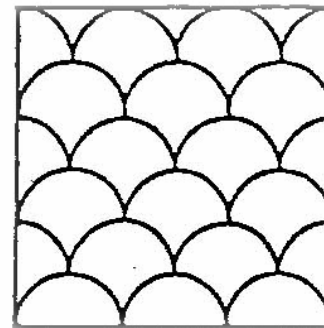
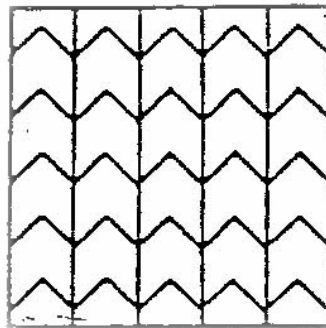
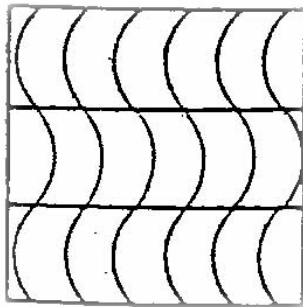
SLIDING

Each row of structural subdivisions can slide in either direction regularly or irregularly. In the case, one subdivision may not be directly above or next to another subdivision in an adjacent row.



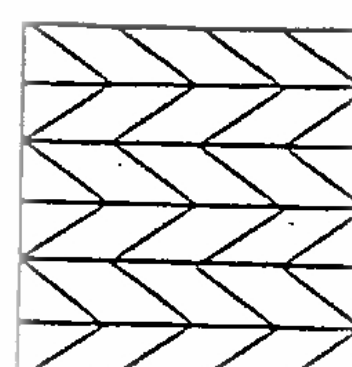
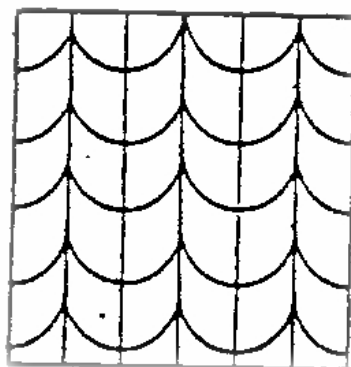
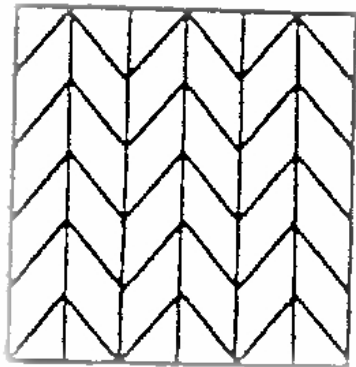
CURVING AND/OR BENDING

The entire set of vertical or horizontal lines, or both, can be curved and/or bent regularly, resulting in structural subdivisions still of the same shape and size.



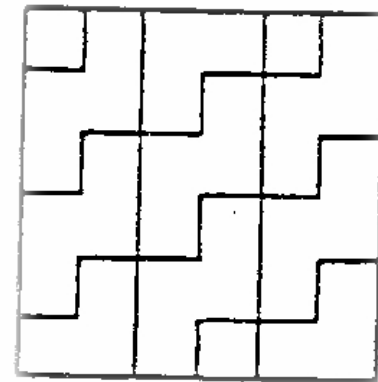
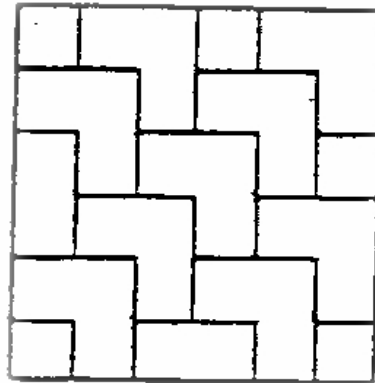
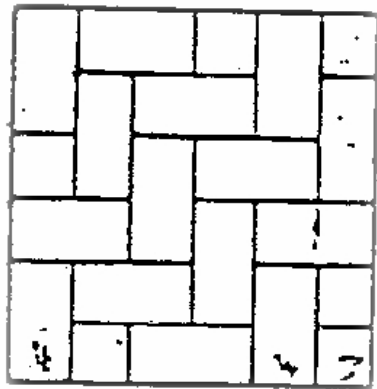
REFLECTING

Unit form is reflected to each other.



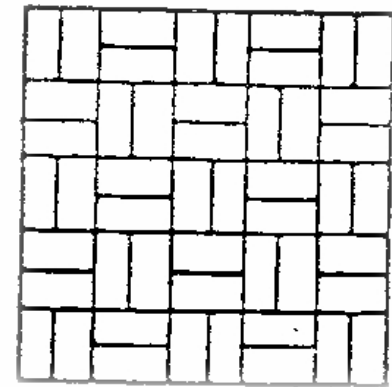
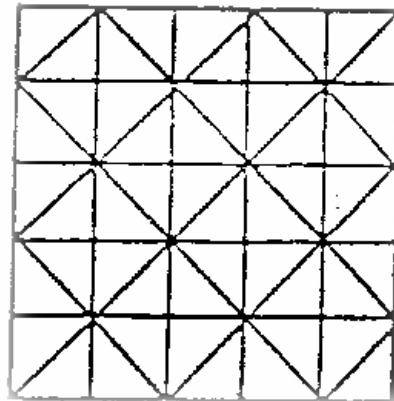
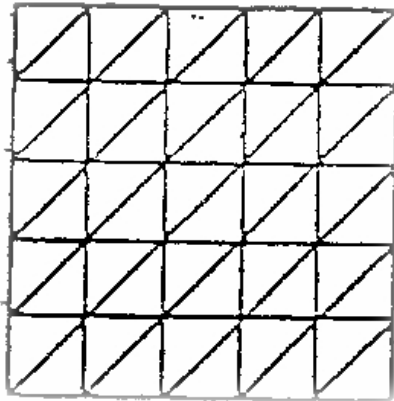
COMBINING

Structural subdivisions in a repetition structure can be combined to form bigger or perhaps more complex shapes. The new bigger subdivisions should of course be of the same shape and size, and fit together perfectly without gaps in the design.



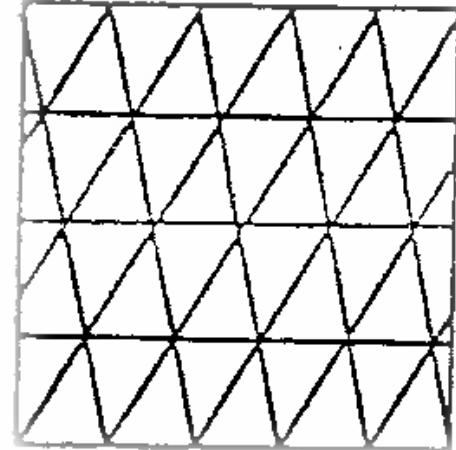
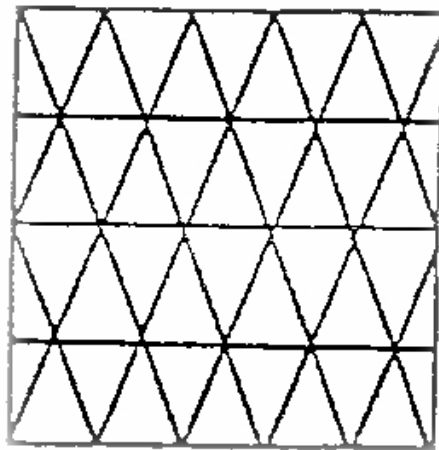
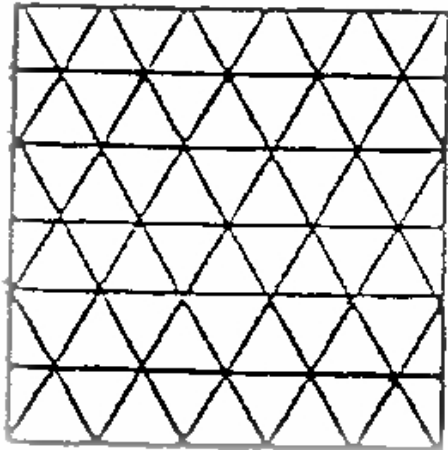
FURTHER DIVIDING

Structural subdivisions can be further divided into small or perhaps more complex shapes. The new, smaller subdivisions should be the same shape and size.



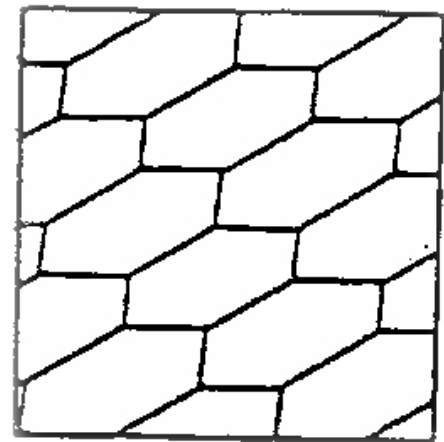
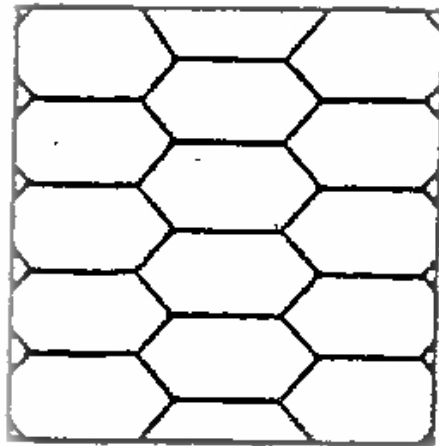
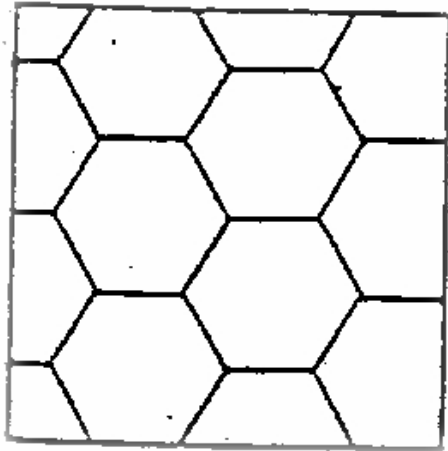
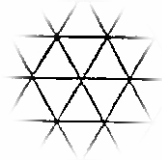
THE RECTANGULAR GRID

Tilting of the direction of structural lines and further dividing the subdivisions thus formed.



THE HEXAGONAL GRID

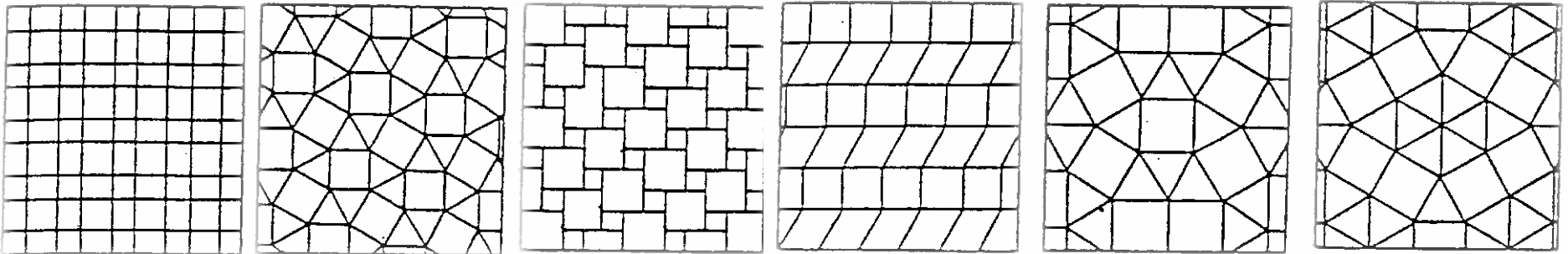
Combining six adjacent spatial units of a triangular grid produces a hexagonal grid. It can be elongated, compressed, or distorted.



When the structure consists of more than one kind of structural subdivisions which repeat both in shape and size, it is no longer a repetition structure but a "multiple repetition structure".

A multiple repetition structure is still a formal structure. The various kinds of structural subdivisions are woven together in a regular pattern.

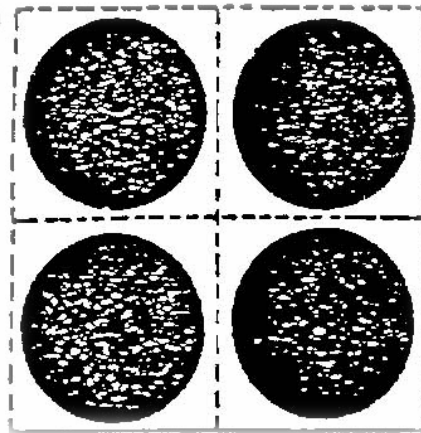
MULTIPLE REPETITION STRUCTURES



In an inactive (and invisible) structure, unit forms are either positioned in the center of structural subdivisions, or at intersections of structural lines.

They can fit exactly, be smaller or bigger than the subdivisions. If bigger, adjacent unit forms will touch, overlap, penetrate, subtract, or intersect one another.

* UNIT FORMS AND

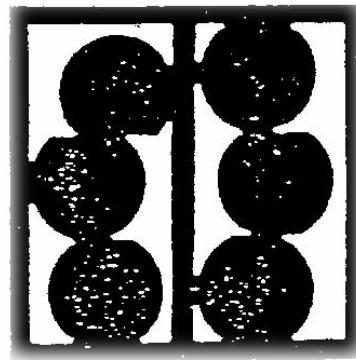


AL SUBDIVISIONS

Inactive and invisible structure

In an active (visible or invisible) structure, each unit form is confined to its own spatial subdivision, but it is not necessarily placed right in the center of the subdivision.

It can just fit, be smaller or bigger than the subdivision, but it is seldom so big that it extends too much beyond the area of the subdivision. Variations of position and direction can occur.

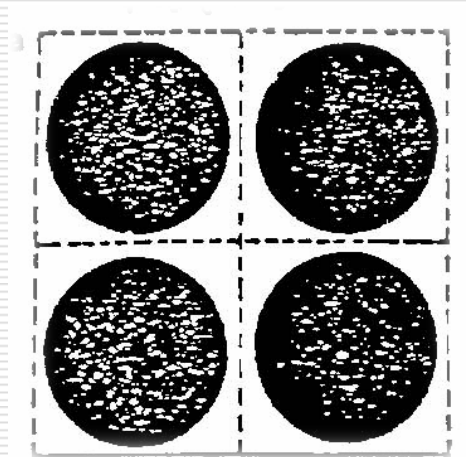


active + visible combined with invisible structure

It means that the unit forms are all positioned inside each sub-division in exactly the same way

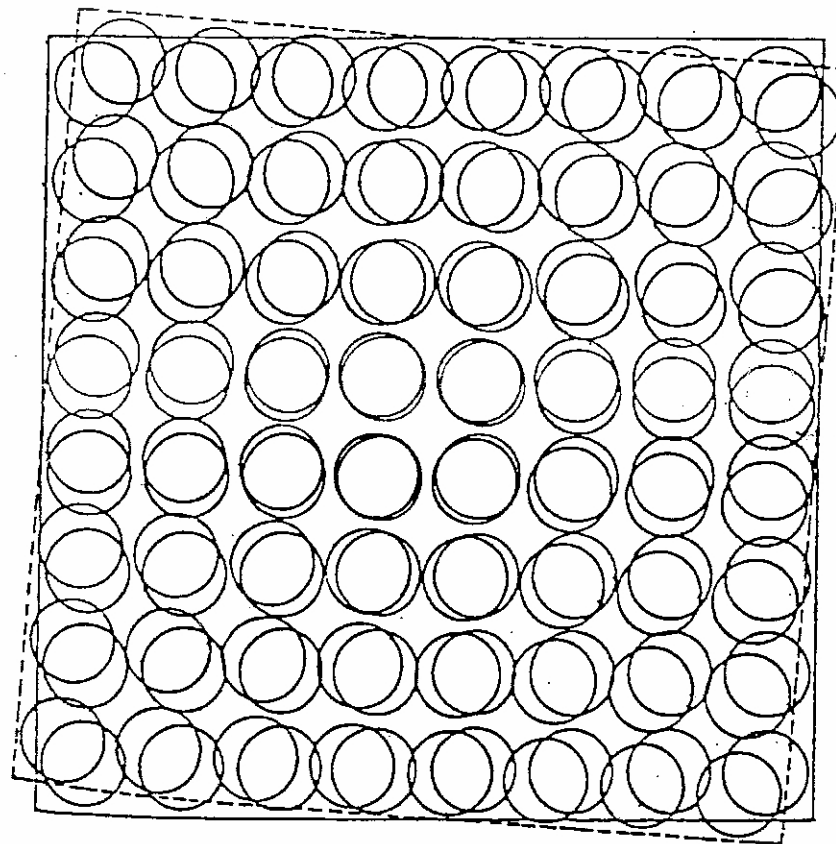
*** REPETITION OF POSITION**

Repetition of structure exists always in inactive (and invisible) structure, because if the positioning of unit forms inside each subdivision varies, the regularity of the repetition structure may be easily destroyed.



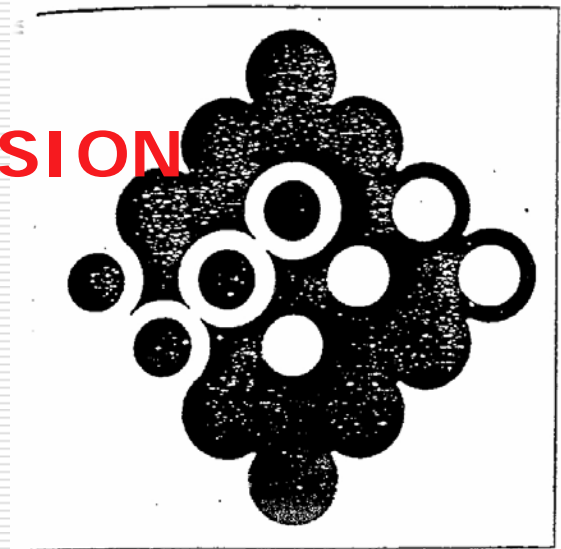
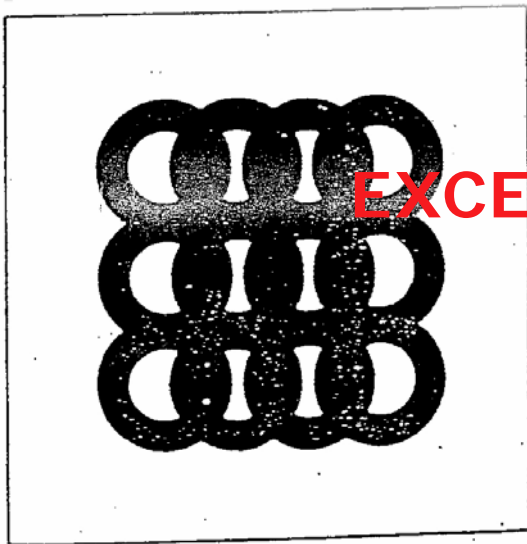
Inactive and invisible structure

* SUPERIMPOSED

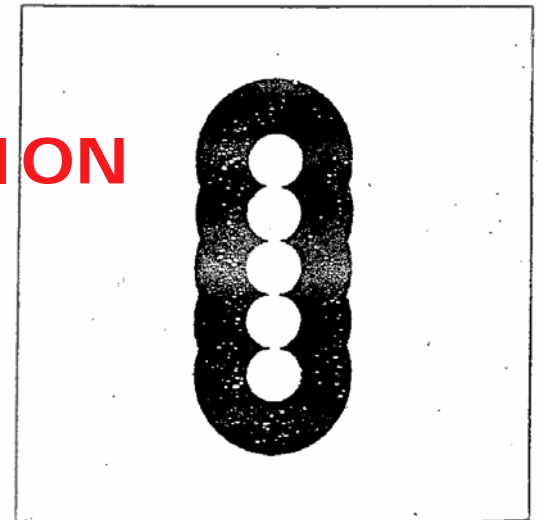
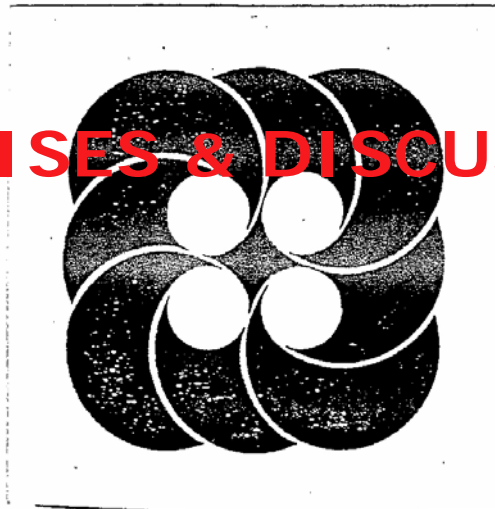
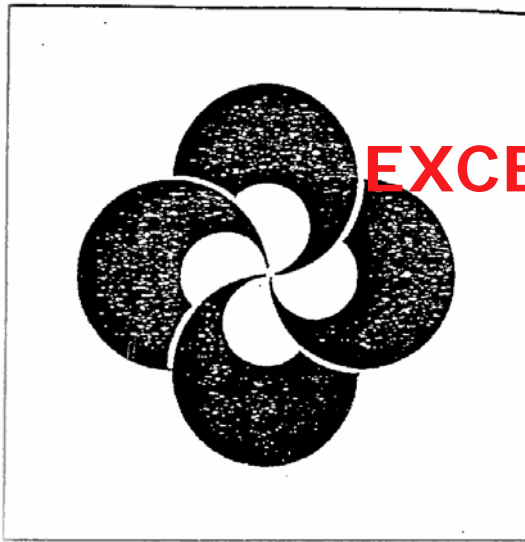


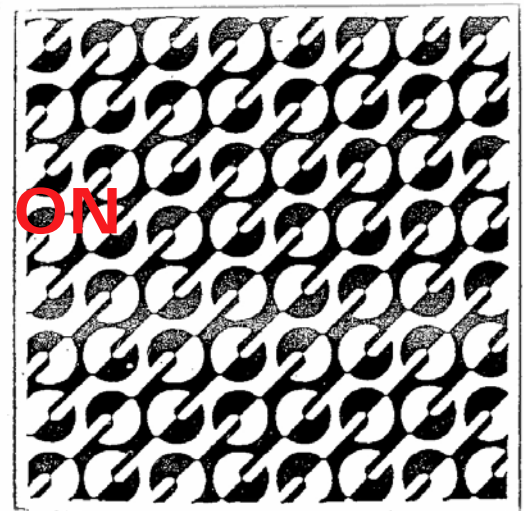
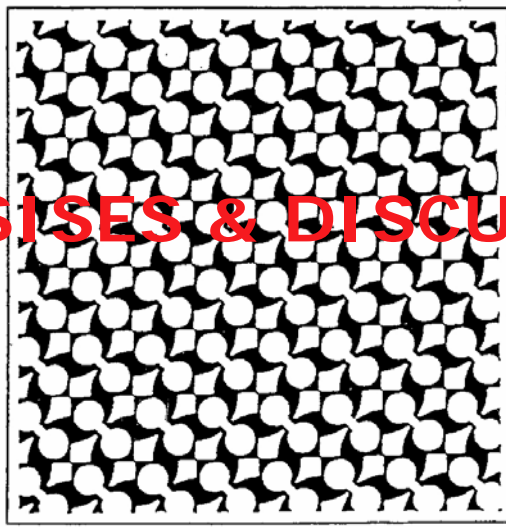
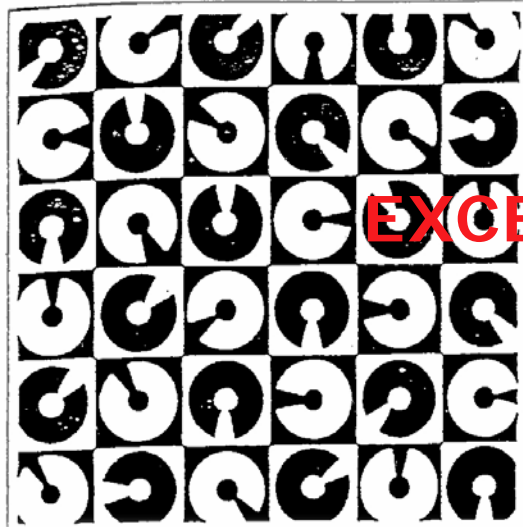
STRUCTURES

EXCERSISES & DISCUSSION



EXCERSISES & DISCUSSION

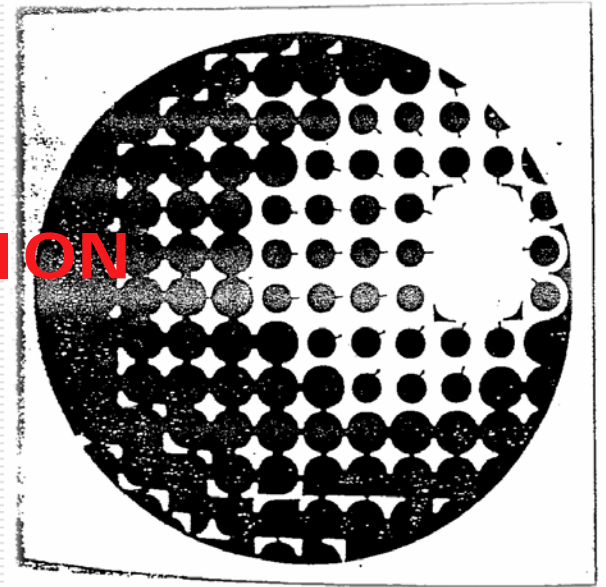
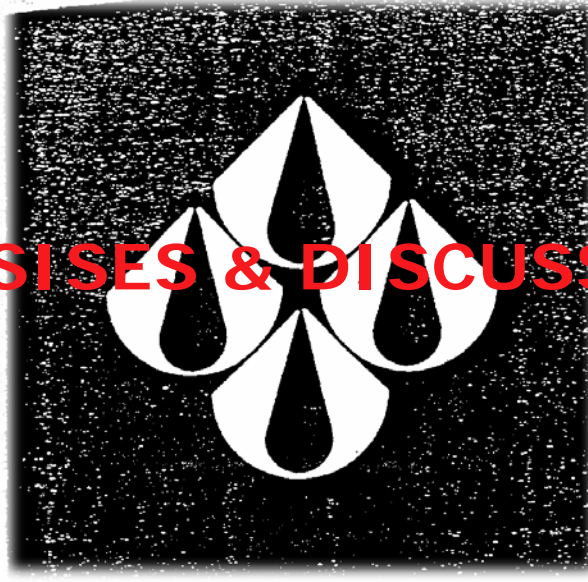
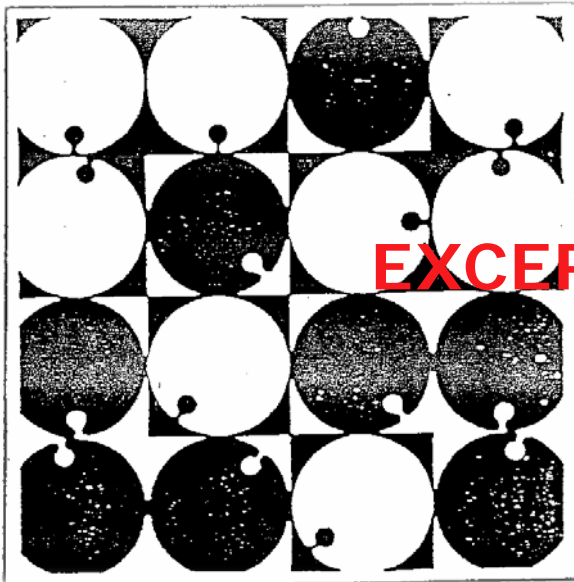




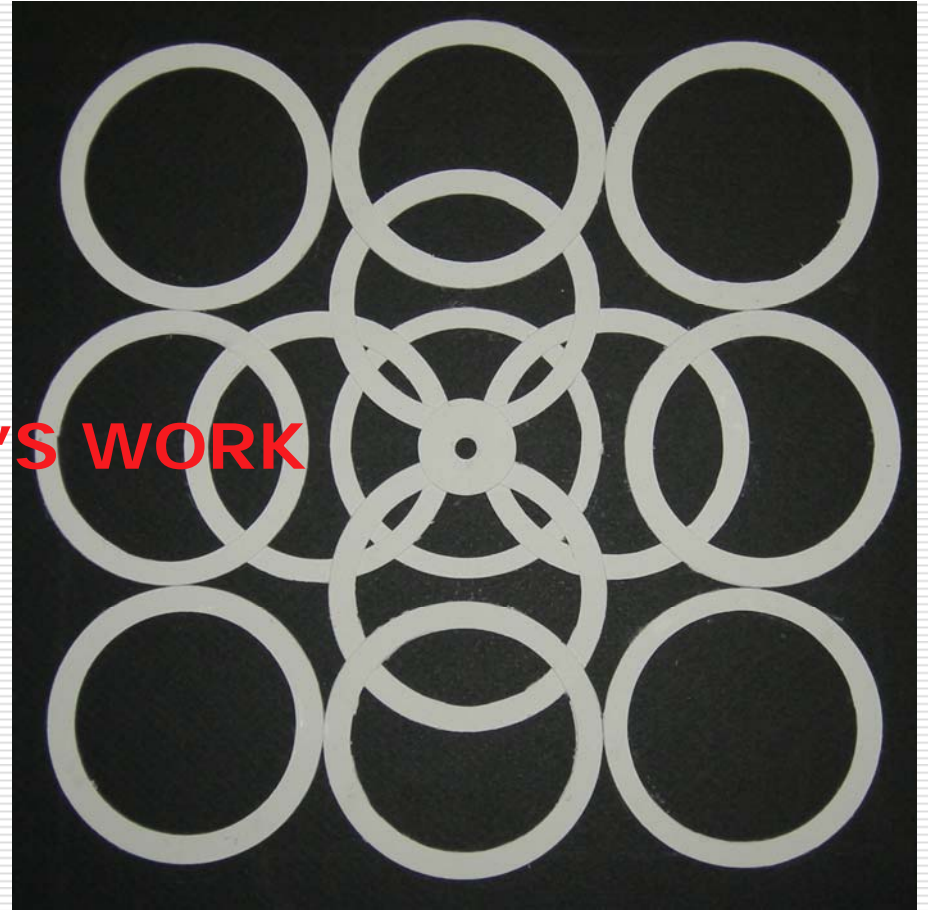
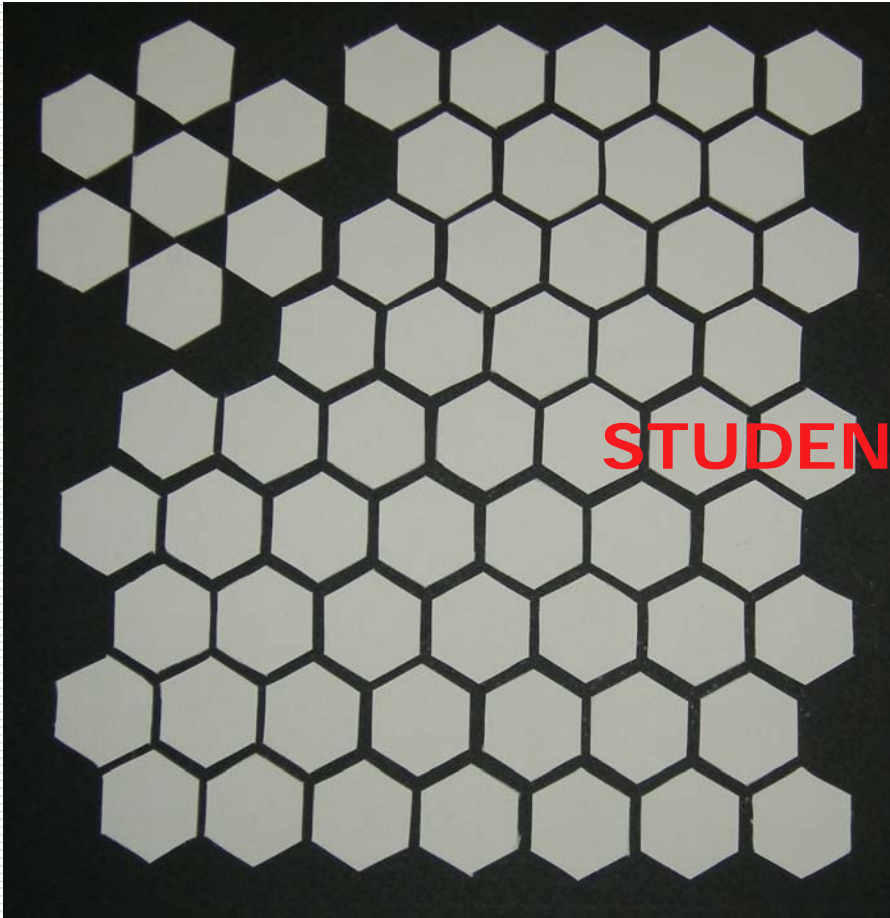
EXCERISES & DISCUSSION

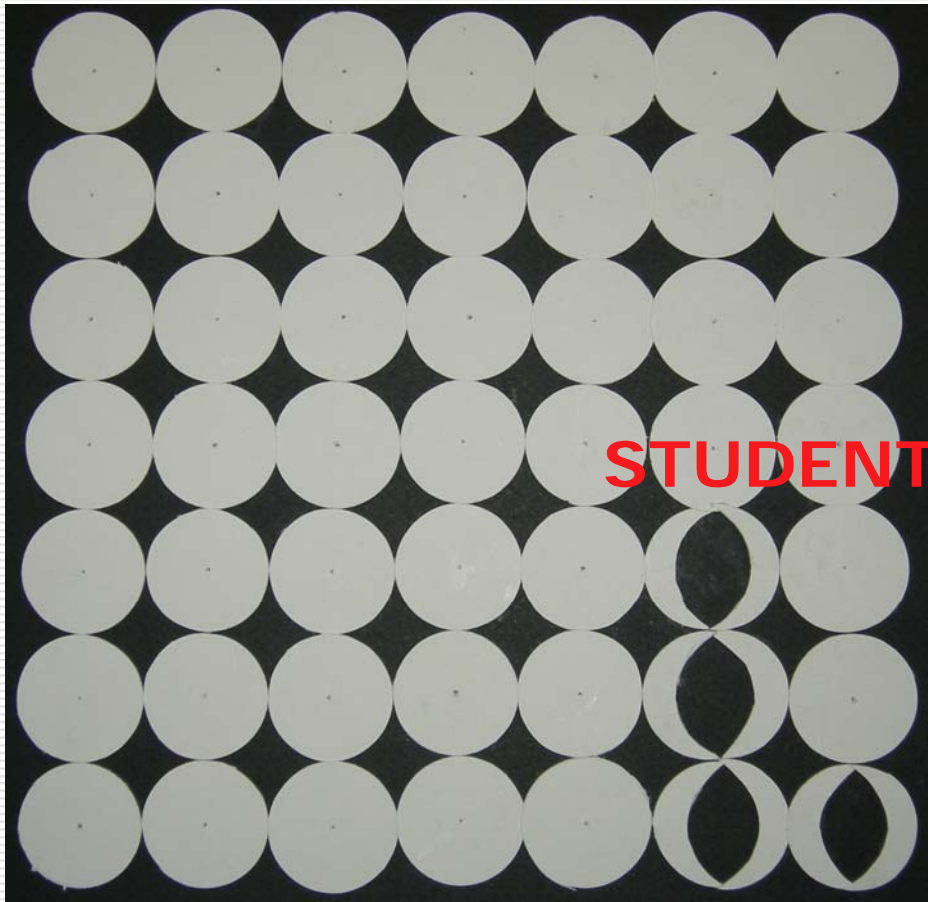


EXCERSISES & DISCUSSION



STUDENT'S WORK





STUDENT'S WORK

تم بحمد الله