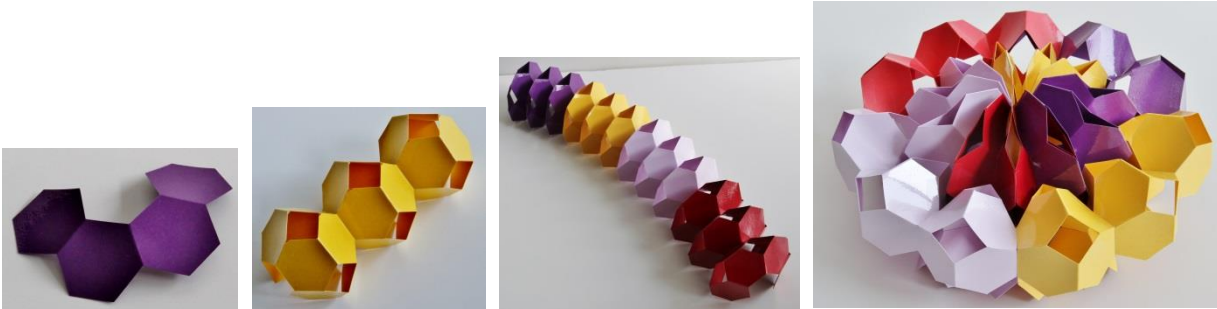


Workshop: XColony – Marine Series – Jellyfish

Sorin Alexe, Ph.D., Jan 28, 2015



Jellyfish Model: from basic module to the full model

Objectives

Learn new properties of regular hexagons and chains of hexagons, flexible, kinetics and interactions. Experiment with stability, symmetry, rotations and locking.

Use the KDK elements to solve various puzzles and to build the constructions described in the accompanying manual.

Materials

Movies from the XColony channel on Youtube and KDK DVD.

Elements and documents from the KDK box

Internet resources: pictures, documents, movies

Organization

The workshop is organized in groups of 4-6 participants.

Activities

1. Presentation of the theme and objectives (10 min)

- watch the introductory and step-by-step instructions movies
- brainstorming on the content of the movies: how many items have been identified, what kind of description could be associated with them, what other names should be given to these items in order to better designate them? Find associations with objects from reality and life, science (flowers, animals, crystals, molecules) and art (films, tilings, architecture, origami).

2. Distribution of materials (5 min)

- identification/designation of the elements,
- generate hypothesis on their use and foresee the final construction to be made

3. Playing and Learning Activities. Construction, Puzzle solving, Discovery (40 min)

- each group will inspect the materials and investigate through puzzle solving the 2D properties of the available elements
- visualize the way to construct the basic modules and construct all of them
- formulate the strategy to be applied to construct the final object: shedule tasks, assign tasks to members of the group equitably, proceed
- investigate geometric, kinetic and combinatorial properties of the final construction; visit other groups and discuss your findings; ask questions, challenge the others to pose problems and puzzles, ask for new solutions

4. Concluding the workshop (5 min):

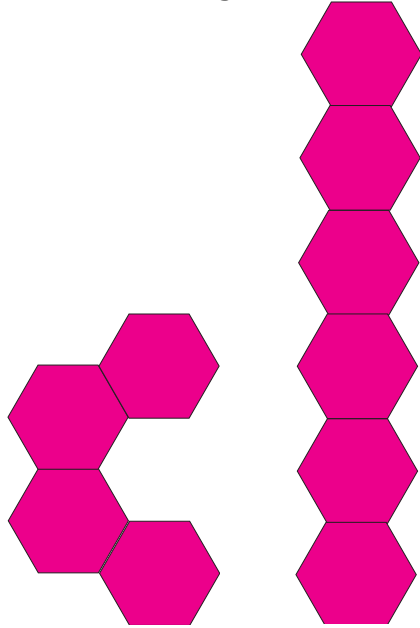
- recall the most interesting part of the workshop (each group identify one)
- pack and store or distribute the final constructions made. If the constructions are distributed there should be a fair system for that (e.g., a number of credits is assigned for every participant, each construction costs a number of credits, the student with a highest number of credits in the group will pick first and his/her number of credits is adjusted by the cost of the object). Students should be encouraged to design their own system of credits). After several sessions all students would have taken home at least one object.



Appendix

Activity 1

Inspect the 24 Hc4 and 16 Hi6 elements having different colors.



Position them in plane such that you get configurations with the following shadows:

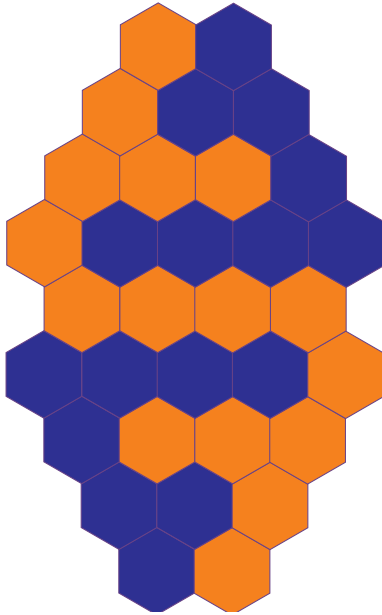


Can you get the magenta shade using only one type of elements? Can you use either type?

Create 2 more problems of like these.

Activity 2

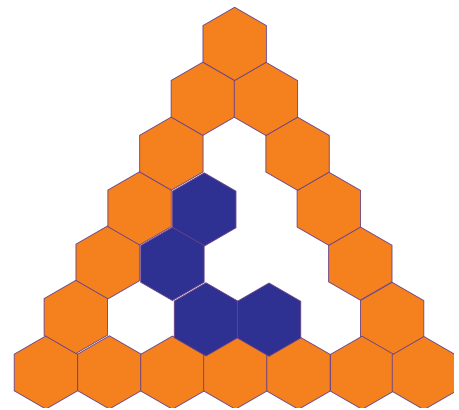
How many Hi6 elements are there in the next picture? If you find it difficult to answer look at the next picture, or even better try to experiment it by using 2 color elements.



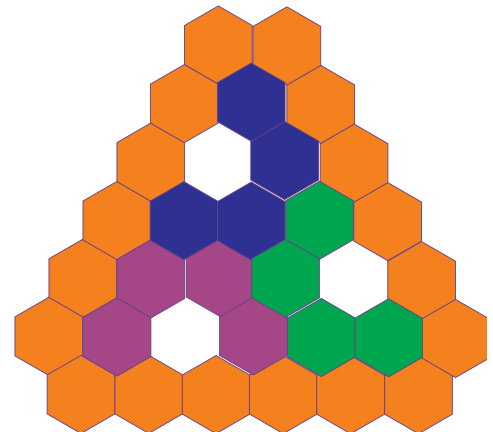
Activity 3

Use 3 Hi6 elements to build a triangle. Any 2 elements should have 2 edges in common.

How many hexagon can you fit inside without overlapping? How about Hc4 elements?



What conditions do you have to change to be able to place 3 Hc4 elements inside?



Activity 4

Using Hi6 elements reconstruct the following image:



Investigate a number of different patterns that can be generated this way.

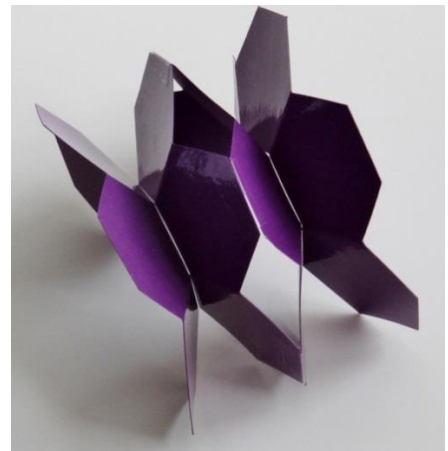
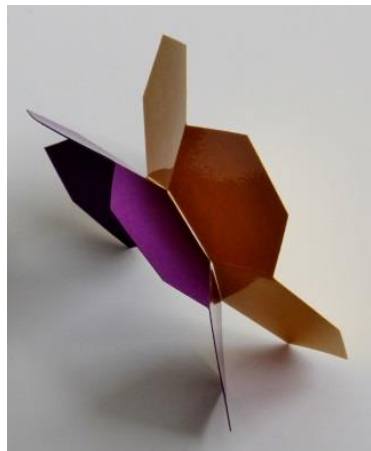
Activity 5

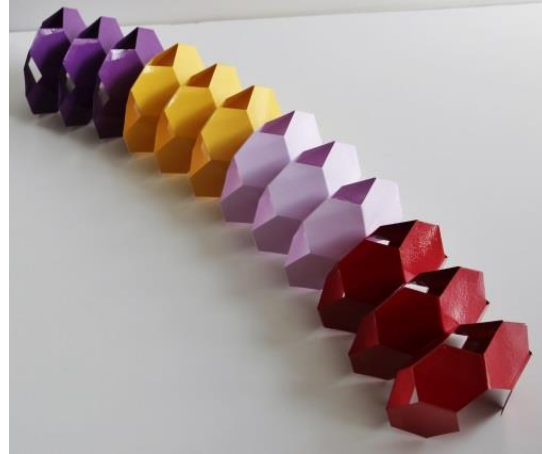
Using Hc4 elements and a very fine sense for equilibrium, can you recreate the following structure without tapping?



Activity 6

Construct a Jellyfish using the Hc4 elements





Activity 7

How else can you construct this structure. Look at each part with only one color. Can you use stripes instead of rings to build it? Try using the Hi6 modules to build a similar structure. Now you have two of them.



Activity 8

Change the form of the objects you obtained at Activity 7 to rings, by locking in the first and the last modules.



Experiment with torus-like rotations and place one on top of the other (the left one is built by Hc4 elements, the right one is built from Hi6's; put the left one on top). Press the top one inside the base in a configuration as the one shown below.

