AkaarNitee

A Strategy Based Educational Game On Volume

AUTHOR:

Sarang Kusale

- Master of Design [Industrial Design] from IDC, IIT Bombay in 2009
- ‘AkaarNitee’ is the outcome of a design project which was developed under guidance of Prof. A.G. Rao from IDC IIT Bombay

KEYWORDS:

Play and Learn, Children, Learning, Education, Spatial Thinking, Volume, Geometry, Mathematics

ABSTRACT

Every child explores the world through playing. It encourages the development of the child. As the child grows up, he/she faces abstract concepts introduced in the syllabus. While understanding the Secondary School environment, we felt the absence of connection between education and playing. We also found that in a subject like Mathematics, many children face problems in understanding concepts of volume and area. These fields of geometry need physical experience for better understanding. To bridge this gap, a play and learn kit named, 'AkaarNitee' is designed and developed. AkaarNitee is a strategy based educational game on volume. With the help of this kit, children will enjoy and develop their 'logic' as well as 'tacit knowledge' in the domain of volume.

INTRODUCTION:

- Playing:
  - Enriched experiences
  - Develop skills & knowledge
  - Natural way of learning

  (Papert, Seymour, 1980), (University,2008)
- As the child grows up:

  At secondary school level the distance between playing and learning increases

PROBLEMS IDENTIFIED:

- In Mathematics:
  - Abstract concepts
  - Volume as problem area
- Lack of the practical experiences results in less interest for learning (Gupta,2008)

NEED OF PROJECT:

- To establish and strengthen the connection between playing and learning
- To encourage the play value in learning

PROJECT BRIEF:

To design and develop
a play and learn kit for
Secondary School children
from standard VIIth & VIIIth.

AIM:

To teach them the abstract
concept of volume
in a playful manner
by bridging the gap between
playing and learning.

EXPLORATIONS:

- Which is bigger volume?

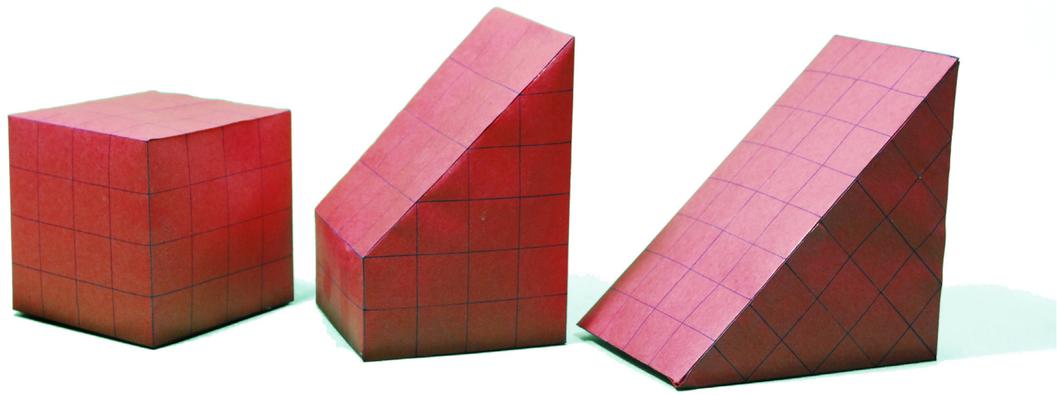

Fig.1: shapes with reference grid marked.

- Form variations with constant volume
- Transfer and comparison of quantity
- Real life applications
- Design insights driven by ‘wrong answers’

THE CONCEPT:

A strategy based educational game on volume - **AkaarNitee**

Fig.2: AkaarNitee- game setup for Trekking Treasure.

- Level 1: *'Trekking Treasure'*
  - Chance based
  - Perceptions of volume

- Level 2: *'Count-n-Fun'*
  - Complex level
  - Needs intellectual strategy
  - Counting of volume

CONDITIONS :

To collect the coin-block, player need to complete respective cube.

In ‘Count-n-Fun’ the cube formation needs to satisfy respective value of coin-block.

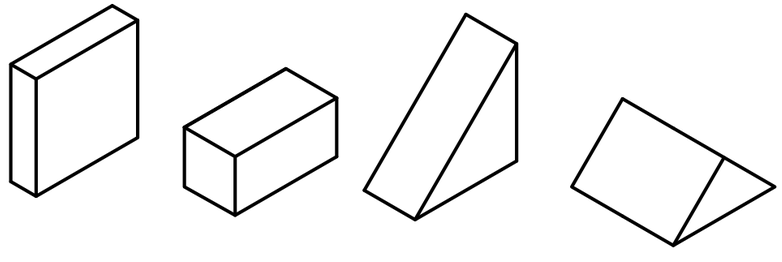

Fig.3: Point-blocks

FORMATION OF CUBE:

- Arrangement of 4 ‘Pointblocks’ forms a cube
- Permutations & Combinations
- Chance & Strategy
- Need Spatial Thinking

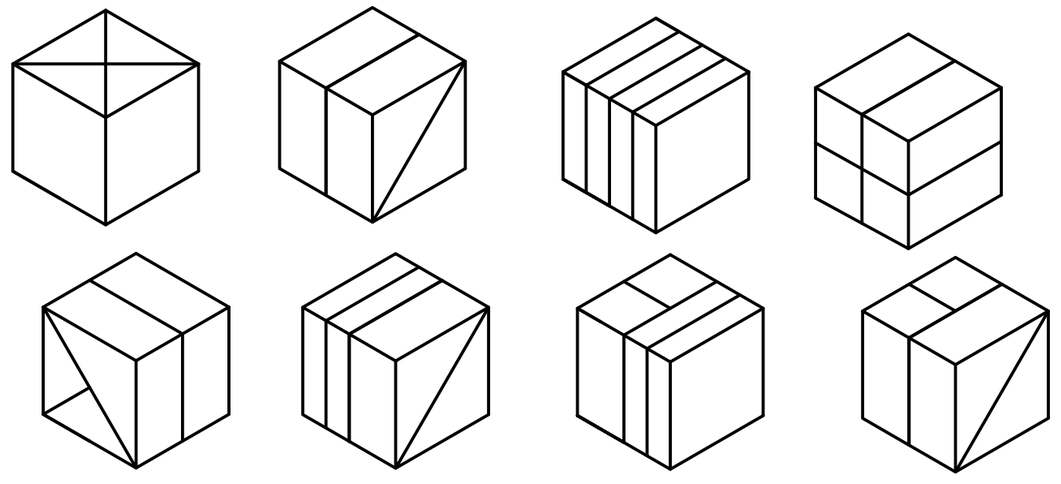

Fig.4: Cube formations with Point-blocks

GAME FEEDBACK:

- Ability to attract repeat play
- Fantasy and Interest
- Sharing of knowledge
- Deeper level of interaction
- Interesting and attractive
- Strategic play is observed
- Problem solving challenge
- Ability to hold interest
- Education due to game
  - Builds Volume Perception
  - Experiencing Volume
- Chance and Strategy
- Intellect and Practice improves performance
- Ability to generate levels
- Indoor use

Fig.1: Feedback#1

Fig.1: Feedback#2

Fig.1: Feedback#3

Fig.1: Feedback#4

ACKNOWLEDGEMENT:

Prof. A. G. Rao (Project Guide)

All the children, parents and teachers who participated and shared their views.

Kendriya Vidyalaya IIT Powai, Pomegranate Workshop Group, Prof. Uday Athawankar, Arvind Gupta, Shashidhar, Darshan, Paridhi, Rohan, Ratika, Nagsen, Abhishek, Rudrapal, Samarth and IDC Staff.

REFERENCES:

Gupta, A. from Arvind Gupta Toys: http://arvindguptatoys.com [accessed 17 Sept 2008]

Papert, Seymour. (1980). Mindstroms- Children, Computers and Powerful Ideas. New York: Basic Books, Inc.

Polanyi, M. (1998). Personal Knowledge- towards a post critical philosophy. CRC Press.

Rao, A. G. Colouring Bamboo Strips with Natural dyes. Mumbai: IDC, IIT Bombay.

Topsfield, A., Rangachar, V., & Jaffer, A. (2006, December). Marg- A magazine of Arts. Games and Puzzles of Mysore , 58 (02).

University, N. I. (Ed.). How Children Learn Through Play. from http://www.niu.edu/ccc/curriculum/learn_play.shtml [Accessed 22 July 2008]