



# Boal & Cody

cognition toys for visually-impaired children

## Design Issues

There are a few products designed for visually impaired children. In fact, children growing up without good eyesight need more attention and guidance in developing their overall ability. Our designs integrate a wide range of instant feedbacks and allows the visually impaired children to generate human sensations through the interaction with toys, and to boost up their curiosity through repetitive movements in the game.



march 4, 2012  
 testers : visually disabled children  
 Taipei school for the Visually-Impaired, Taiwan





- Math**
  - Number cognition
  - Logic
- Recognition**
  - Voice cognition
  - Object cognition
  - Shape cognition
- Application**
  - Imagination
  - Creativity

### Toy Categories

Five toys categories and five stage of early intervention.

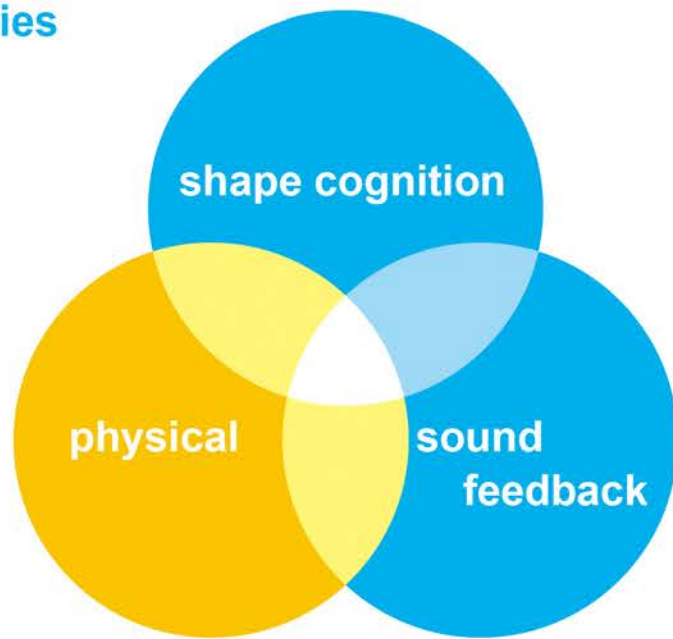


### Research & Investigation

According to learn goals, toys can be sorted into five categories. Cognition has been proved that could be improved effective by playing toys. Visually impaired children do not have access to visual modelling and shaping of expected behaviour patterns. Cognitive ability will affect the ability to conceptualise the environment in the absence or reduction of visual information.

### Design Advocacies

Learning Goals



### Cognition

#### shape cognition

help them to conceptualise the environment quickly

#### sound feedback

the most important sensory of Visually impaired

### Physical

#### physical

an important part of development in early intervention stage

### Normal children



toy car = car

### Visually impaired children



toy car ≠ car



How they know what's a car really like?

1.give them a real object



2.divide object into geometries



trapezoid windows  
+  
hatshape car body  
+  
circle wheels





## Boal-both equal

Boal transforms the sense of balance into sound, giving the children an idea of weight difference in the material world. The appearance and position of each brick in the set produce different sounds in feedback, and trains the children to follow their sensations while using it.

### Learning Goal :

1. shape cognition
2. number cognition
3. voice source localization
4. logic
5. space recognition

### material :

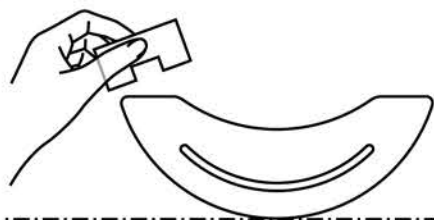
1. wood
2. magnets

### size :

240 X 93 X 40 mm  
bricks : 72 X 36 X 25 mm



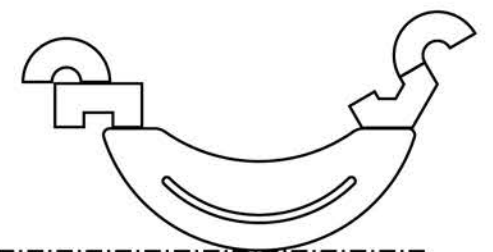
## Operation



**Step1**  
put the bricks on one end



**Step2**  
making a weight difference,  
the heavier side makes sound



**Step3**  
it make no sound in balance

## Detail



### 1.structure

When the toy imbalance, the ball in the tube rolling, than hit the bell to make sound.





## 2.magnet

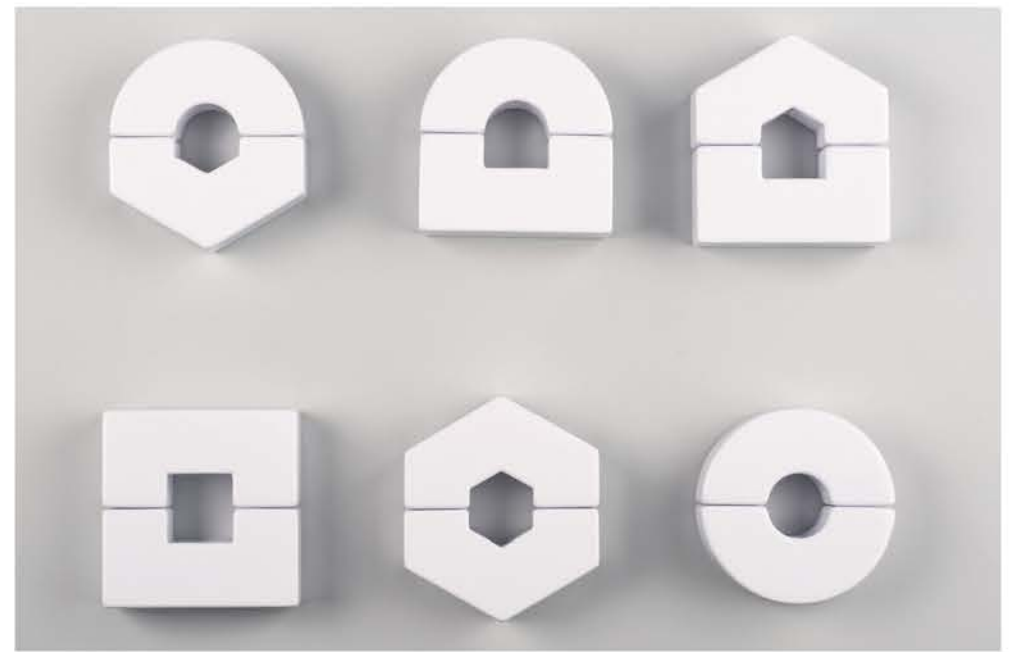
With the magnets inside, operation is made to be stable and simple.

## 3.sound hole

Small bell in the bricks. Sound feedback are really noticeable for the children.

## 4.physical development

Blind children often have low muscle tone. Muscle training by separating the bricks which with magnetic.



## 5.combination

Semi-geometric shape are free to be reassembled into other shapes.



## Cody-composing a melody

Cody is a toy set designed to enhance the interaction between parents and children. It connects the shapes and sounds. Pull different brick in, Cody give different sound. Then pull all bricks out, it will makes a short melody. While receiving the sound and learning to recognize the shape, children's sensorial and memorial ability is built up altogether.

### Learning Goal :

1. logic
2. memory
3. shape cognition
4. voice cognition
5. direction recognition

### material :

1. wood
2. reed

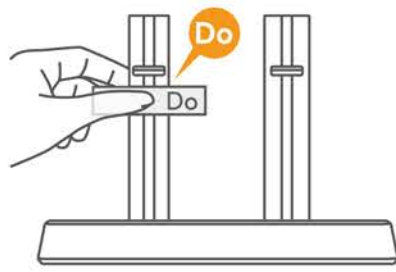
### size :

210 X 145 X 90 mm  
brick : 60 X 60 X 18 mm

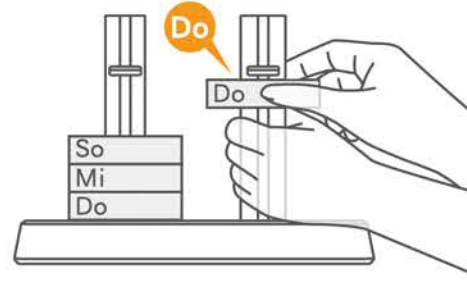




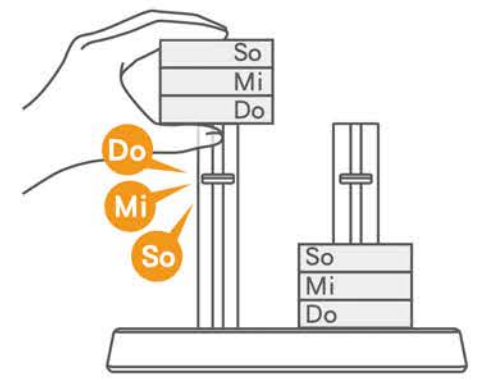
# Operation



**Step1**  
parents demonstrate the sequence of a melody by putting the bricks in



**Step2**  
children mimic parents to make the same sequence



**Step3**  
putting all the bricks out to make a melody

# Detail



## 1.shape

As the sticks go through the brick, different shape of bricks sound at the corresponding scales. Children would be able to compose as their wish once they get familiar with the relationship between the scale and shape.



## 2.convex

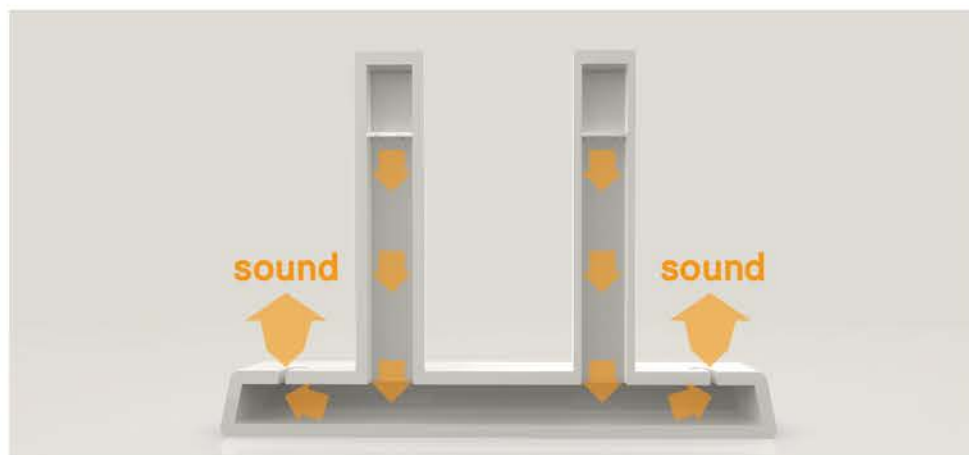
The convexes of various shape are at different position.

## 3.spot

The embossed spot on each brick helps children differentiate the top from the bottom surface.

## 4.reed

While in practice, the brick slides along the elongation direction of the hollow pillar. Meanwhile, the convex structure triggers the reed so as to generate a sound having a predetermined scale.



## 5.body

Body's hollow structure make sound that made by reed louder.



## 6.pillar

Two sticks are shaped differently, allowing children to train their muscles in performing movements with precision.