# iExploration: Using an iPad for Vision Stimulation

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**Mission and History**

For nearly six decades, Junior Blind's mission has been to help those who are blind, visually impaired or multi-disabled achieve independence. Vision disorders are the fourth most common disability in the United States and the most prevalent handicapping condition during childhood. In California, it is estimated that over 723,000 people suffer from some form of vision loss, a figure that continues to grow.

**Infant & Early Childhood Program**

The Junior Blind program, launched in 1983, provides comprehensive early intervention services for approximately 450 children, birth through age six, who are multi-disabled and blind. Our Infant Services use therapeutic infant sensory stimulation to help prevent and correct developmental delays in multi-disabled blind children from birth to age three.

**The iPad Study**

Since the early 1980s, the Light Box developed by the American Printing House for the Blind (APH) has been a significant tool in working with children with visual impairments and/or multiple disabilities on functional vision tasks. The development of the Apple iPad in April of 2010, offers a technological option that is significantly more visually appealing and thus more likely to stimulate visual engagement with children with visual impairments and/or multiple disabilities.

The purpose of our study was to investigate the use of the Apple iPad as a means to strengthen or initiate visual engagement, parental interaction, communication, visual attentiveness, reaching and/or activation with children with visual impairments and/or multiple disabilities. The study compared data from a sample of 60 children ranging from ages birth to three in a study conducted over a period of six (6) months.

Using similar methods initiated by Cote & Smith (Cote & Smith. Look At Me, College of Optometry Press, Philadelphia, 1982.), we observed the use of the Apple iPad in comparison to the APH Light Box. We employed a six (6) item pretest / post test session and analyzed the students'

performance doing Apple iPad tasks for three (3) months, followed by a three (3) month period of APH Light Box use.

Using multiple Apple iPad applications, measured and divided by difficulty and genre, we introduced the Apple iPad as a tool similar to the APH LightBox. Following a similar study conducted at Auburn University, directed by Margaret Flores (Flores. Auburn researchers using Apple iPads to help children with Autism Spectrum Disorder <http:Hwireeagle.auburn.edu/news/1642> November 4, 2011), we used optimum applications that elicited activation and interaction.

**The Following was a short list of Applications we used in the Study:**

Art of Glow
Awesome
Baby Finger HD
Baby's Musical Hands
Bubble's Magic
The Cat in the Hat
Cosmic Top
Fireworks Arcade
First Words: Toddler Touch and Say
Kids' Song Machine
Little Bella's— I Close My Eyes
Infant Arcade
Infant Visual Stimulation
Magical Images Imagine
Paint Sparkles
Peekaboo HD
Rainbow Pad
Shapes Toddler
Wheels on the Bus HD

**iPad Study Results**

After 6 months of tracking data we found that 100% of the children who participated in the program ranging from birth to 3 made significant improvements in the following areas: communication, visual attentiveness, reaching, and activation. The data showed that only 47% of the children who used the iPad in the first cycle improved their skills coming back to the lightbox in the second cycle. In that same group, all the children either retained skills at the same level that they had gained in cycle one or at higher level than they had begun. 100% of the children who used the lightbox in the first 12 weeks made significant gains after cycle two use of the iPad.

**What We Learned**

After logging more that 1400 hours of iPad use and conducting sessions, the infant visual specialists monitored which applications best stimulated our children. These applications have become the basis of what we now call the iPad curriculum for Infants with Visual Impairments and/or Multiple Disabilities. Development of the curriculum continues as we encounter new applications. We hope to use the iPad as a tool to supplement vision stimulation strategies. The curriculum will be completed by the Fall of 2014.

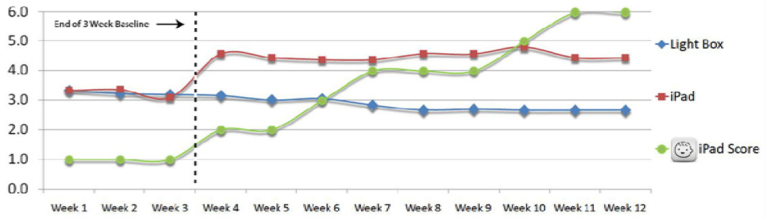
# Graphed Data and Findings

The following is the rating system that will be used under each section of data we will collect: (30 minute sessions)

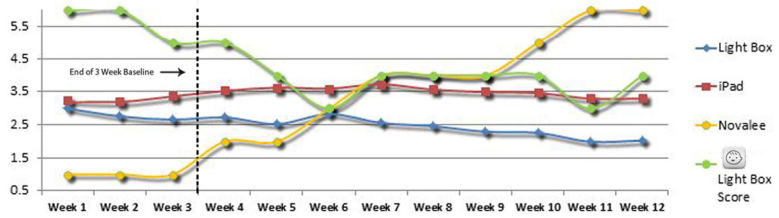
## Length of Engagement

1 - 0-5 minutes
2 - 5-10 minutes
3 - 10-15 minutes
4 - 15-20 minutes
5 - 20-25 minutes
6 - 25-30 minutes

Cycle 1



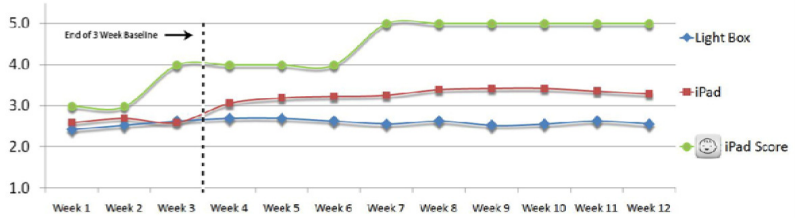

Cycle 2




## Communication

1 - Non Responsive (no response at all)
2 - Increased Body Movement (breathing changes, eyes widening, smiling, etc.)
3 - Actual Sounds - Vocalization (babbling, cooing, laughing, etc)
4 - Vowel sounds
5 - Clear Verbal Communication (Combination of Vowels to make a word)

Cycle 1

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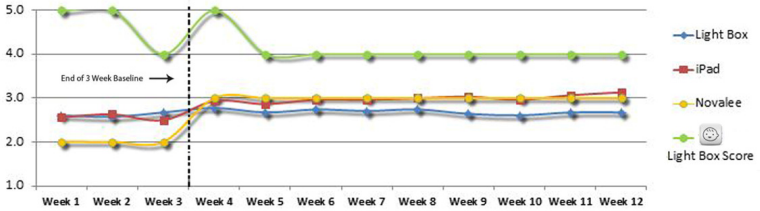
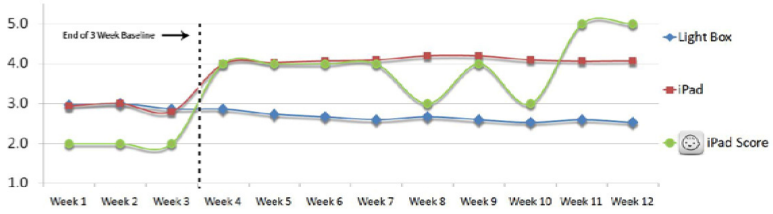



## Visual Attentiveness

1 - Non Responsive (No Visual Attentiveness)
2 - Somewhat Responsive (Momentary focus and exploring contents on screen)
3 - Responsive (tracking items on screen horizontally and vertically)
4 - Increased Response (Increase in amount of attention to activity on screen)
5 - Fully Responsive (engaged and fully attentive to activity on screen)

Cycle 1

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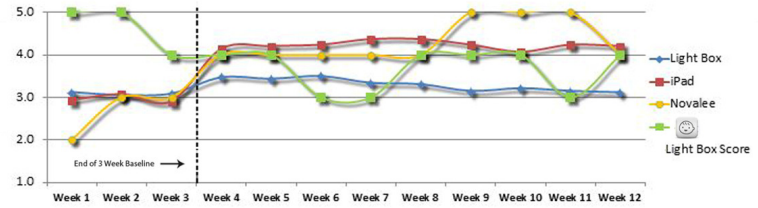
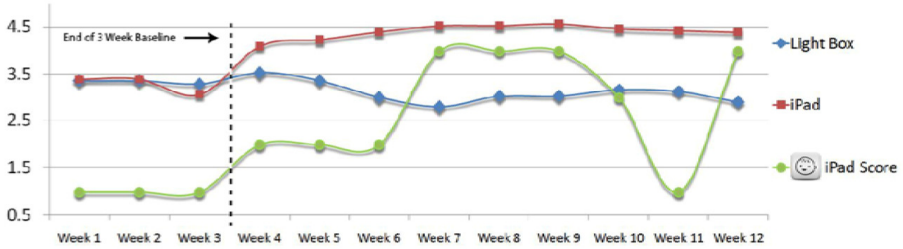


# Reaching

1 - No Response
2 - Some increased hand movements.
3 - Reaching Out (No direction intended)
4 - Hand movements in direction of desired object
5 - Full reaching to desired object (Grasping and/or landing hand on desired object)

Cycle 1

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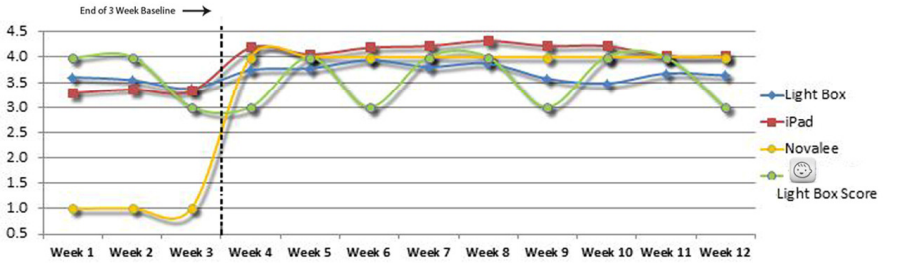
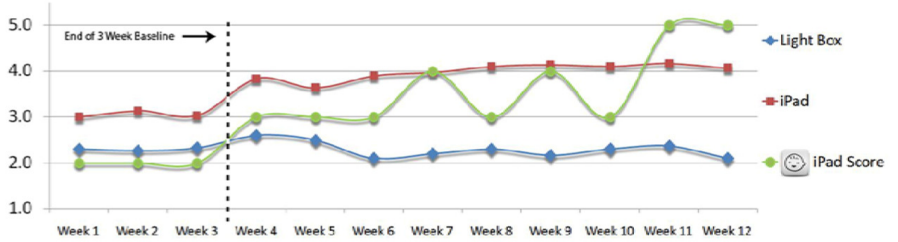



# Activation

1 - No Reaction
2 - Activating Object without specific purpose (10-20% of the time)
3 - Activating Object without specific purpose (20-40% of the time)
4 - Activating object with purpose half of the time.
5 - Fully engaged in meaningful activity with object.

Cycle 1




Cycle 2