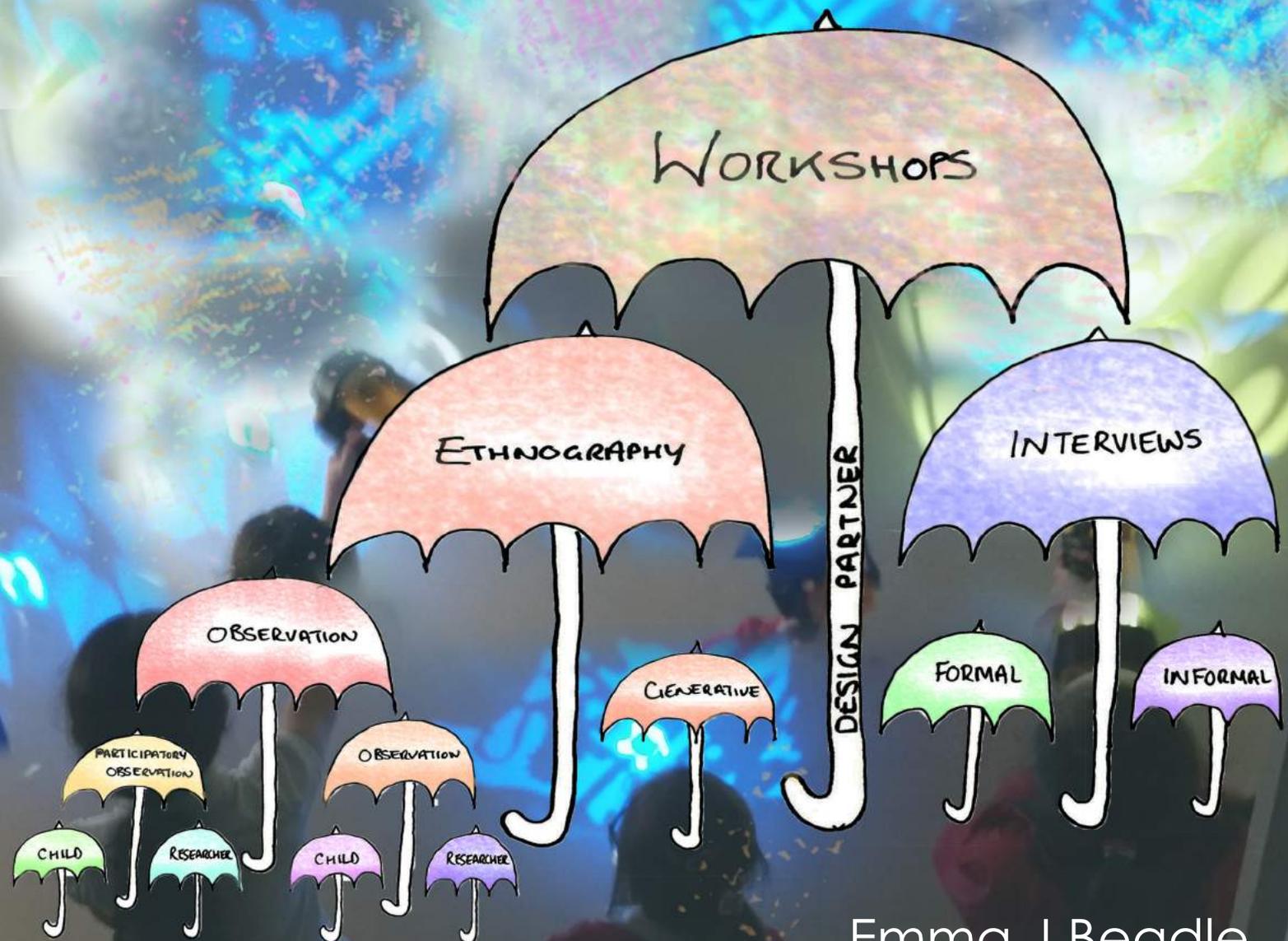


# Children's Utopian Visions of the City: co-designing lighting masterplans through play and exploration



Emma J Beadle

# Contents

---

<b>Contents</b>	<b>2</b>
<b>List of Tables and Figures</b>	<b>3</b>
<b>Introduction</b>	<b>4</b>
<b>Background</b>	<b>5</b>
<i>The lighting industry origins</i>	5
<i>Co-design origins</i>	6
<i>Co-design methods</i>	8
<b>Methodology</b>	<b>10</b>
<b>Results</b>	<b>12</b>
<i>Lighting utopian visions</i>	12
<i>Testing lighting games</i>	15
<i>Tool-kit of light</i>	19
<b>Discussion</b>	<b>20</b>
<b>Conclusion</b>	<b>23</b>
<b>Reference List</b>	<b>24</b>
<b>Appendices</b>	<b>25</b>
<i>Appendix 1 - Interviews</i>	25
<i>Appendix 2 – Tool-kit Manual</i>	36

## List of tables and figures

---

Cover art: The methods of children’s lighting co-design projects and their utopian visions. (Personal collection)	1
Figure 1: Artificial light timeline (Personal Collection) Information - (Heals, 2018), (Luxlive, 2016) and (Jackson, 2016)	5
Figure 2: The junk playground. ‘Skrammellegepladsen’ (Hedqvist and Svenle, 2014)	6
Figure 3: Druin’s children's co-design roles expanded by Melonio and Gennari (2013)	7
Figure 4: Children's observation. (Personal collection)	9
Figure 5: Triangulated methodology. (Personal collection)	10
Figure 6: Utopian drawings and models –mini exhibition (Personal collection)	12
Figure 7: Utopian light stencils (Personal collection)	13
Figure 8: Examples of several games from Table 1, A: Glow stick game, B: Material Box game, C: Light stencils, D: Where’s the Light? Game, E: Draw a picture of light game, F: Blocks and Bubbles game. (Personal collection)	16
Figure 9: Example workshop feedback form. (Personal collection)	17
Figure 10: Results from workshop feedback forms. (Personal collection)	18
Figure 11: Umbrella methods. This image highlights how all the methods are incorporated in the workshop method and how further methods are incorporated in the ethnography method. (Personal collection)	20
Figure 12: Benefits to children of learning about lighting. (Personal collection)	22
Figure 13: Tool-kit of light. (Personal collection)	22
Table 1: Lighting games (Personal Collection)	14
Table 2: Children's Feedback. (Personal collection)	19

## Introduction

---

Light is important, it plays a crucial role in everyday life with the possibility to inspire and transform a city, along with improving the well-being of the citizens. The field of lighting design is un-heard of in schools, and it is also not well known in the adult world. To boost future interest in lighting design the Society for Light and Lighting (SLL) have encouraged lighting professionals to work with schools and teach young children about the basics of light and design thinking (Thompson, 2017).

One way of working with children is through co-design, which has existed for several years. The benefits of working with children on lighting projects are twofold; it introduces lighting to children and allows the lighting designer to experience new innovative ideas, as children have an uninhibited imagination. Children's co-design has gained recognition in the technology field. Technology is similar to lighting in its complexity, which is why both subjects are often approached in a 'hands-on' way during co-design projects. Furthermore, the use of interactive activities encourages the children to be '*motivated and enthusiastic*' to learn (Melonio and Gennari, 2013).

This project aimed to raise awareness of the field of lighting design, and to introduce the basics of light to children. By conducting workshops on a theoretical lighting project with children, the study explored which co-design methods worked best. The ultimate goal of the project was to work with the children to design a 'Tool-kit of light'; a box containing lighting games to help children understand the basics of light. Subsequently, this tool-kit can be replicated and used by other lighting designers as a tool for teaching numerous children about light and as a basis for future co-design projects.

## Background

---

### The lighting industry origins

To raise awareness about the field of lighting design it is important to first understand its origins. Figure 1 shows the development of artificial light since its beginning in 1807 through to the first LED in the 1960's.

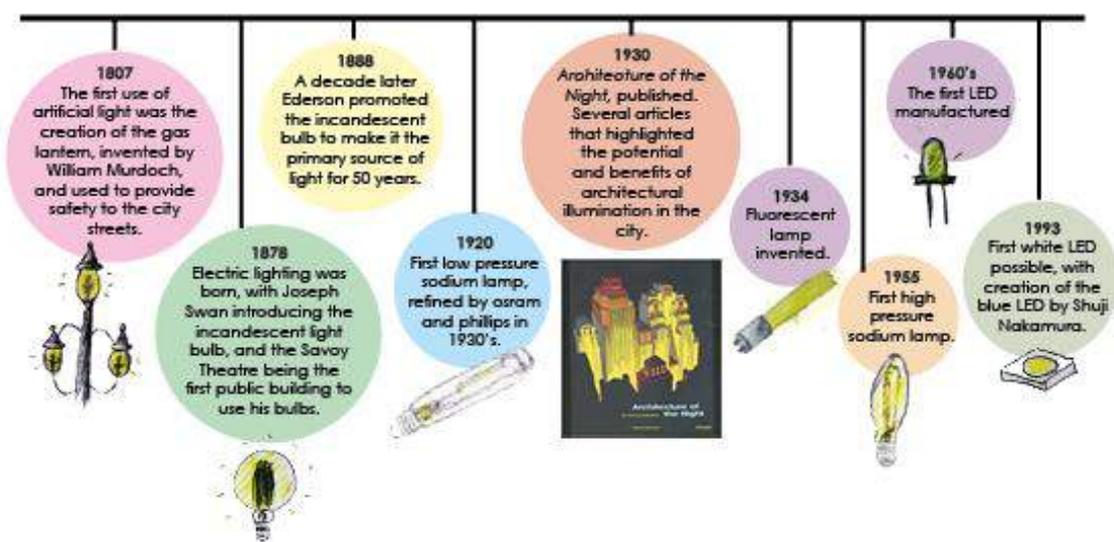


Figure 1: Artificial light timeline (Personal Collection) Information - (Heals, 2018), (Luxlive, 2016) and (Jackson, 2016).

Despite electric light being around since 1878, and the suggestion of architectural illumination being utilised in cities in the 1930's, the lighting design industry has only been around for several years. With lighting consultants such as Spiers and Major founded in 1992, the International Association of Lighting Design (IALD) founded in 1969, and Kevan Shaw Lighting Design founded in 1989. Before lighting consultants had their own companies the bulk of the lighting design work was done by architects and electricians. Lighting is only recently being recognised as a field on its own.

## Co-design origins

The term 'co-design' can be primarily described as; the process of engaging consumers and users within the design process to produce relevant products for the consumer by moving away from only the designer's opinion, to now including that of the consumer (Burkett, n.d.).

Co-design projects have been mainly adult based, which may be due to the perceived challenges of working with children; i.e. poorer written and verbal communication skills and longer time needed to complete activities (Guha et al., 2011). However, Lozanovska and Leilei (2013) argue that children's design ideas are innovative and very different from those proposed by adults, as children see the world differently and often have a richer imagination than adults (Hagen et al., 2012).

The first children's co-design project was documented in 1943, where a landscape architect Sørensen worked on a children's playground. He encouraged children to shape the space, and adults were only allowed to assist the children in the design process (Hedqvist and Svenle, 2014) (Figure 2).



Figure 2: The junk playground. 'Skrammellegepladsen' (Hedqvist and Svenle, 2014).

In the 1990's children's co-design projects became more valued when developing children's research (Farber et al., n.d.), leading to children being promoted from users and testers to *Design Partners* (Guha et al., 2011)(Figure 3). Since the 1990's, children's involvement in the design process has become more common (Guha et al., 2011), leading to the adaption of adult co-design methods for children. Previous co-design studies have altered their methodologies "to meet the unique needs of their younger design partners" (Farber et al., n.d.).



Figure 3: Druin's children's co-design roles expanded by Melonio and Gennari (2013)

## Co-design methods

There are several established children's co-design methods; ethnography, observation, interviews and workshops. These methods have been approached by several designers (e.g. *Druin, Grønbaek, Lambert, Hagen, Farber, Melonio, Gennari, Lozanovska and LeiLei*), either in their standard form or have been re-adapted to work with the needs of the children. It is important that the methods utilised in children's co-design projects are approached in an interesting and fun way for the children, whilst being somewhat challenging to allow children to develop their skills (Melonio and Genneri, 2013).

Ethnography can be described as "*an approach to learning about the social and cultural life of communities*" (LeCompte and Schensul, 1999). Within children's co-design projects, ethnography is utilised by researchers through 'semi-hands-on' activities for children to complete. Examples include drawings and collages, which the researcher can collect as physical data, whilst also observing and documenting children's behaviours. Melonio and Gennari (2013) use the term '*Generative Methods*' to describe these 'semi-hands-on activities'.

In children's co-design the observational method can be adapted to work in two ways; either observation from the child's perspective or the researcher perspective (Figure 4). Lambert (2013) believes that observation is most effective in children's co-design, as it allows data collection about events that occur naturally.

Lambert also advocates interviews as an important co-design method, as she conducted one-to-one interviews with children in hospitals, as part of her 2013 study. She found the results highly beneficial and often conducted the interviews in the child's natural habitat to make them feel more comfortable. She believes that interviews are important in children's co-design projects as they allow children "*the opportunity to express their subjective views and experiences*" (Lambert et al., 2013).

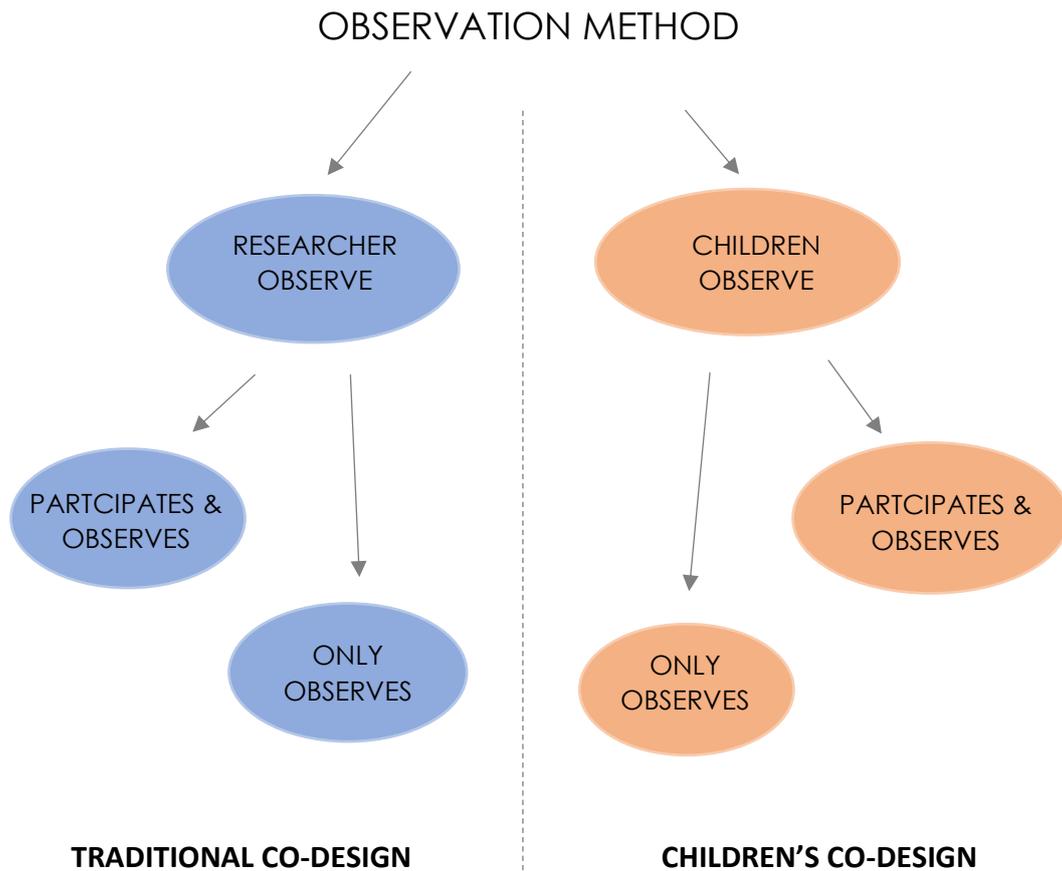


Figure 4: Children's observation. (Personal collection)

In children's co-design projects workshops have an even greater benefit as they create a fun environment which keeps the children engaged for longer. Farber (n.d.) discusses how workshops contain more 'hands-on' activities, which facilitates movement and socialising with other children, which Grønboæk (2007) says leads to a "positive effect on the social life and physical health of children". Children's workshops can incorporate other methods such as interviews, observation and ethnography. The combination of methods was utilised by Druin (2002) through her adapted method of contextual inquiry. Methods involved in contextual inquiry include; observation of the child as they test current technology products, informal interviews with each of the children, low tech prototyping, mock-ups, and technology immersion.

## Methodology

---

In this project a triangulated approach was taken by combining; examination of previous children's co-design projects, interviewing experts in the field of lighting, and creating lighting workshops (Figure 5).

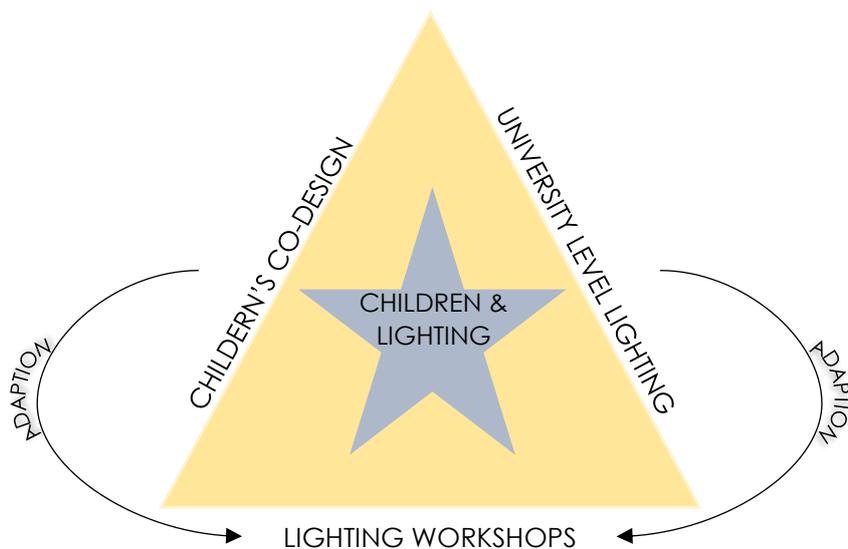


Figure 5: Triangulated methodology. (Personal collection)

Four professional experts in the field of lighting design were interviewed, who also had experience in teaching others about lighting design. The interviews aimed to understand university level teaching methods, which were then adapted and developed to create children's co-design methods (interviews can be read in full in appendix 1).

Critical analysis of studies using children's co-design methods and the interviews with the lighting professionals indicated that workshops were the most beneficial method, especially when they incorporated other methods e.g. ethnography, observation, interviews and Melonio and Gennari's (2013) Generative Method. Firstly, ethnography was used as it allows the researcher to observe and participate with the children in a natural and fun environment, while understanding how the children behave with light. Secondly, observation was applied to the workshop environment through making the children work in pairs. This allowed the children to observe each other, and thus learning

different ways to interact with light. Lastly, Melonio and Gennari's (2013) Generative Method was utilised in the workshops to generate the children's understanding of light, through drawing and storytelling activities. Overall, workshops are particularly applicable to this study as they allow the children to assist in design decisions.

Results from the children's lighting workshops were descriptively analysed from the interviews, feedback forms and visual imagery. This helped me understand how the children experienced the workshops and indicated which lighting games would be the most beneficial and enjoyable to teach other children about light.

The first workshops were built around a theoretical project to re-design urban third spaces in the west of Edinburgh under the topic of utopia (favourite space). Firstly, two schools in Edinburgh were visited, with two age groups targeted: primary 2 (6–7 year-olds) and primary 6 (10–11 year-olds). A design club was also created working with children aged 5–10.

The second set of workshops were used to test lighting games for the Tool-kit of light. Firstly, two Brownie groups aged (6–11) were involved in the initial lighting games workshops, testing four games. The children involved in Design Club were also involved with the Lighting Club, along with the addition of two more children, to test lighting games and create the Tool-kit of light. In total 43 children participated in the two school workshops, two Brownie workshops, Design Club and Lighting Club.

## Results

---

### Lighting utopian visions

The utopian workshops aimed to actualise the children's utopian visions through the media of light. The first workshop sought to understand the children's utopian visions and the second was for the children to use light to envisage their utopian ideas.

The workshop commenced with an introduction to the project and explanations of key terms i.e. utopia, urban and third spaces. The children were shown examples of third spaces to facilitate discussion on the pros and cons of each space, which the children wrote down. This activity was semi-successful as the children were engaged and generated novel ideas. However, the younger children struggled with writing, so a better medium could have been used. This activity aimed to get the children thinking critically about urban third spaces before the next activities.

The next activities involved the children creating their 'favourite' or utopian spaces through drawings and modelling with plastercine (Figure 6). Some children needed a little help; however, most children enjoyed the activities and created many diverse utopian images and models, relating to their interests. This activity allowed the children to actualise their imagination, in a paper or 3D form.



*Figure 6: Utopian drawings and models – mini exhibition (Personal collection)*

The children's utopian drawings and models were used to create utopian stencils, which used light to project the children's utopian visions (Figure 7). We experimented with different stencils, creating stories and making the stencils interact with each other. The children added coloured filters to further visualise their utopian visions. This activity illustrated to the children how their ideas could be visualised and actualised through the use of light.



*Figure 7: Utopian light stencils (Personal collection)*

The utopian workshops identified which children's co-design methods worked best, which lead to the creation of lighting games (Table 1). Each game aimed to motivate and engage the children in a playful way, whilst also being flexible to changes from the children. Table 1 outlines the learning outcomes, methods utilised, activity level and how to play each lighting game.

Game	Blocks & Bubbles	Wheres the light?	Stencils	Glow Sticks	Material Box	Draw a picture of light
Learning Objectives	To understand how light is affected when in contact with other materials, such as solids and translucent.	Studying light in art work - understanding where light is on a painting and where it comes from (direction of light).	Shaping light and creating stories with light.	How you can use light as a material to form into a light sculpture. Introduction to light art.	Manipulation of light and how light reacts differently to the surface that it meets	For the children to understand that they know something about light.
Methods	Experimentation Participatory observation Demonstration	Generative Participatory observation Interviews	Observation Interviews	Participatory observation Interviews	Participatory observation interviews experimentation demonstration	Generative Observation Interviews
How to play	This is the most experimental game. The children have bubbles, blocks and a light source and are encouraged to play with the materials.	Inspired by the popular Wheres Wally? game. The same concept of searching for something was adapted so that the children were looking for the light and its source in several paintings.	Place the utopian stencil over the torch. Add coloured filters.	Split the children into groups. This is a competitive game where the children have ten minutes to come up with a light sculpture with glow sticks. Each group to discuss their sculpture at the end.	Children create a white cube with paper and add cuts to the side. Include filters and reflected materials to adapt the light.	With a piece of paper and some coloured pens, the children need to draw a picture of what they think light is – there is no wrong answer for this game!
Active Level	Hands-on	Semi-hands-on	Hands-on	Hands-on	Hands-on	Semi-hands-on

Table 1: Lighting games (Personal Collection)

## Testing lighting games

The lighting games workshops were undertaken by two Brownie groups and the Lighting Club. They aimed to identify which games were most fun and how effective they were in introducing light to children, with the intent to add the games to the Tool-kit of light.

Most of the games were highly successful, especially the 'hands-on' games (Table 1). For example, the *glow sticks* game (Table 1) was effective due to the fun glow sticks aspect, but it also got the children working in a playful kinaesthetic way, whilst developing necessary design and life skills (Figure 8A). The *stencil* game (Table 1) was also well received, particularly when the coloured filters were added (Figure 8C). These helped the children grasp the concept and have fun exploring and creating stories with the stencils through child-led play.

The games were designed for all ages, for example *where's the light?* game and *draw a picture of light* game (Table 1) only required the children to draw and not write (Figure 8D). However, a few adaptations were made to make some games more accessible. For example, in the *material box* game, more preparation could have been done i.e. cutting of the box sides, as a few children had trouble with this and therefore had less time to experiment (Figure 8B).

Other games introduced novel materials, for example the *Blocks and Bubble's* game (Table 1) involved experimenting with bubbles, blocks, and light in different ways. This generated some innovative ideas, for instance one girl suggested putting water in the translucent blocks to see how the light and shadow changed with this new form (Figure 8F).

Feedback forms were created to understand the favourite game of the session and to understand what the children had learnt about light during the workshops (Figure 9). The results of the workshops can be seen in figure 10.

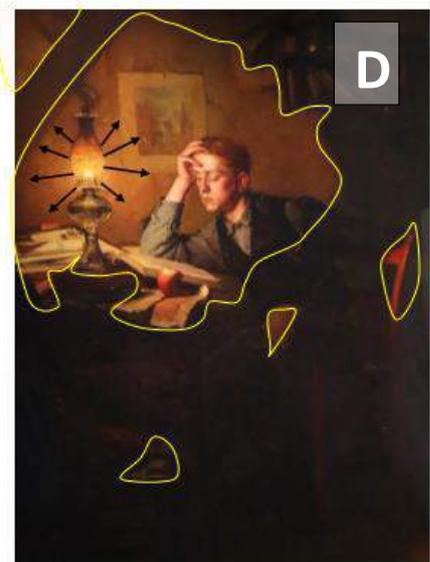


Figure 8: Examples of several games from Table 1, A: Glow stick game, B: Material Box game, C: Light stencils, D: Where's the Light? Game, E: Draw a picture of light game, F: Blocks and Bubbles game. (Personal collection)

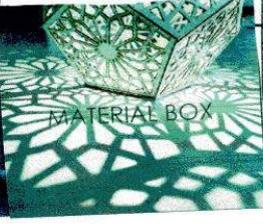
# MARCHMOUNT BROWNIE WORKSHOP - FEEDBACK

HOW DID YOU FIND THE WORKSHOP? (COLOUR IN ONE SMILEY FACE)



WHAT WERE YOUR TOP THREE FAVOURITE MATERIALS WHEN EXPERIMENTING WITH THE BOX?



	BEST		WORST
LIKED THE MOST	 GLOW STICKS SCULPTURES	 MATERIAL BOX	
MOST FUN	Glow Stick sculptures      Material Box		

WHAT HAVE YOU LEARNT ABOUT LIGHTING/WHAT DO YOU UNDERSTAND ABOUT LIGHTING NOW?

light. You can build w,

Figure 9: Example workshop feedback form. (Personal collection)

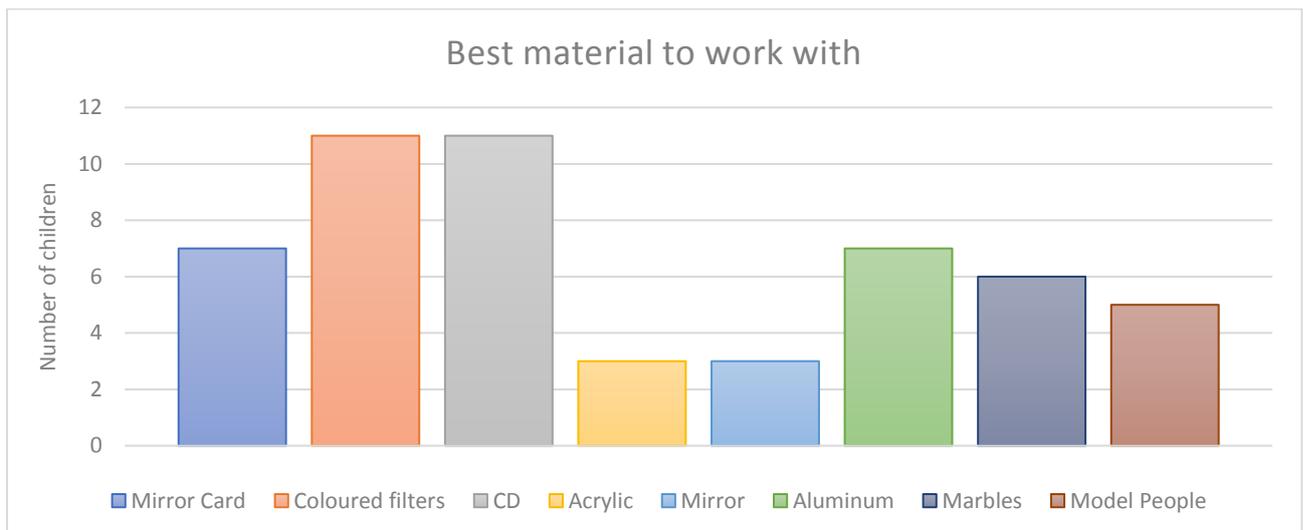
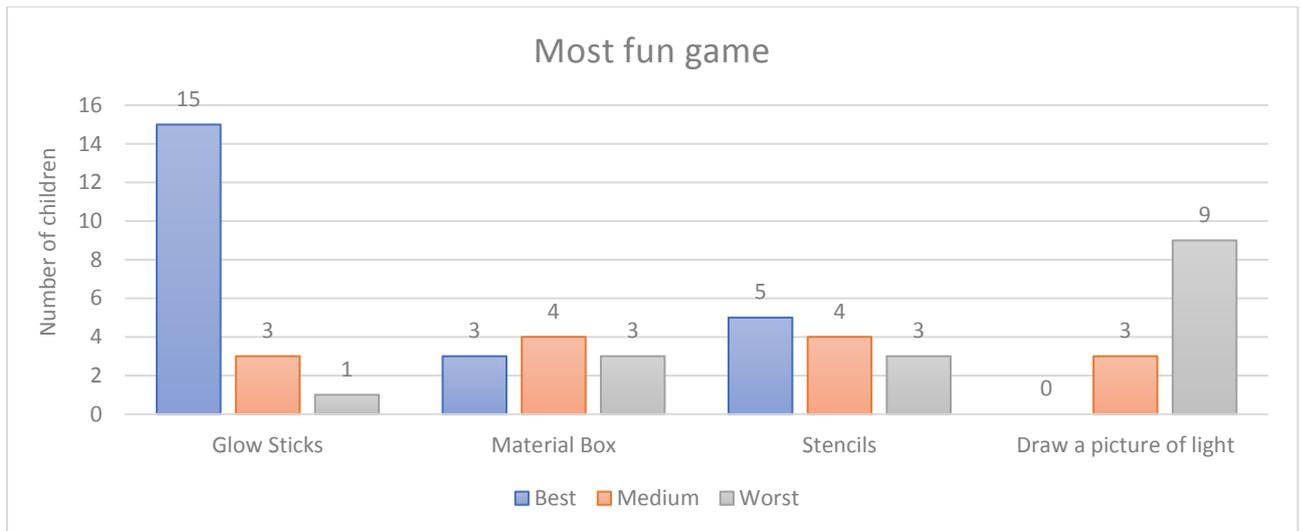


Figure 10: Results from workshop feedback forms. (Personal collection)

## Tool-kit of light

The 'Tool-kit of light' was developed in the second workshop of lighting club. The kit was designed by six children and myself, four of those children being involved in the full process beginning with the utopian workshops.

After testing all the lighting games each child created and designed their own Tool-kit, deciding which games they wished to include (Table 2) that would best teach other children about light in a fun way. Together, the children and myself created manuals of 'how to play the games' (see appendix 2).

The Tool-kit of light created from the Light Club demonstrates a design partner relationship within a children's co-design project, where the children learnt about some of the basics of light and I was introduced to a new perspective of light. Together we experimented with ideas of light in a playful way and from there created a Tool-kit of light. The Tool-kit can now be used by other designers within a children's co-design project, or used solely to introduce some of the basic principles of light to children, thus allowing them to develop the skills involved in lighting design.

	Game 1 Draw a picture of light	Game 2 Where's the light	Game 3 Material Box	Game 4 Blocks	Game 5 Bubbles	Game 6 Stencils	Game 7 Glow Sticks
Child A							
Child B							
Child C							
Child D							
Child E							
Child F							

Table 2: Children's Feedback. (Personal collection)

 Favourite Game     Put in Tool-kit

## Discussion

---

This project highlights the importance of co-design with children. Not only does co-design bring a unique perspective to design projects, it also raises awareness of the field of lighting design. Lighting professionals have highlighted this lack of awareness from both adults and children. Malcolm Innes (2017) found that most people think he is a product designer who manufactures light fittings, while Jeff Shaw (2017) states that “everyone in the industry falls into it by accident because they didn’t know it existed”.

Yet to effectively co-design with children it is essential to understand which methods work best. Workshops appear to be the most prominent and successful method identified, as they incorporate several methods and create an environment of development for children (Figure 11).

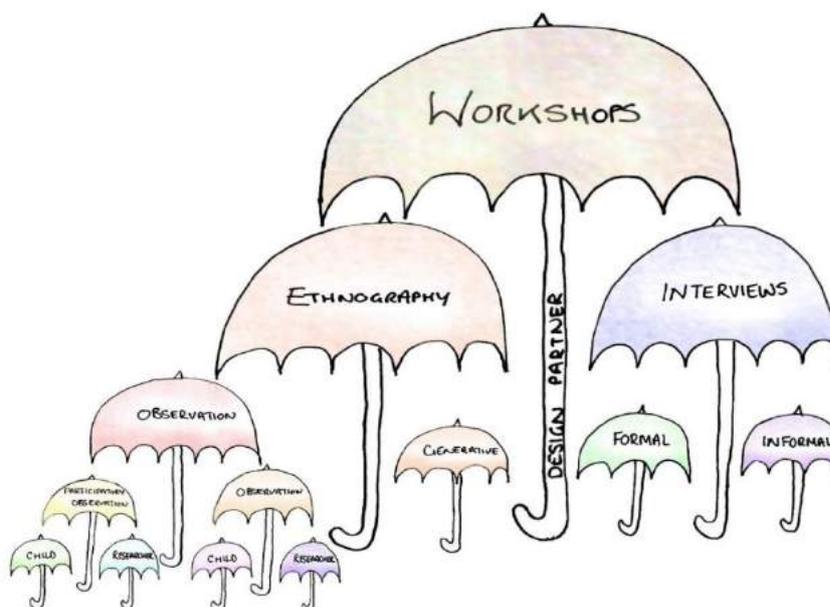


Figure 11: Umbrella methods. This image highlights how all the methods are incorporated in the workshop method and how further methods are incorporated in the ethnography method. (Personal collection)

Malcolm Innes (2017) also advocates workshops because they allow people to experience a “little taster of lighting”. Whilst Kevan Shaw (2017) concurs, and adds that you need a set of tools and a theme which does not sway the

exploration, “as it’s the concept and the theme that’s explored in the workshop, which needs to come from the students, as it’s the most important learning aspect”. The lighting professionals highlighted that workshops are already being utilised in successful ways to educate adults about lighting, and Kevan Shaw (2017) thinks that this method could be adapted to work with children.

The workshop acts as the perfect environment for children to explore, and by working with children as design partners we are giving them control over what they learn. This control makes them feel more confident about their design opinions and motivates their learning. My primary research and secondary sources identified that children are more engaged and motivated in activities if they find them fun and playful, as seen by the enjoyment in the glow sticks game. Furthermore, children who are involved in the design process at workshops create positive memories and experiences in social areas, developing skills in teamwork, confidence, problem-solving, design thinking, mobile skills, and social skills (Figure 12).

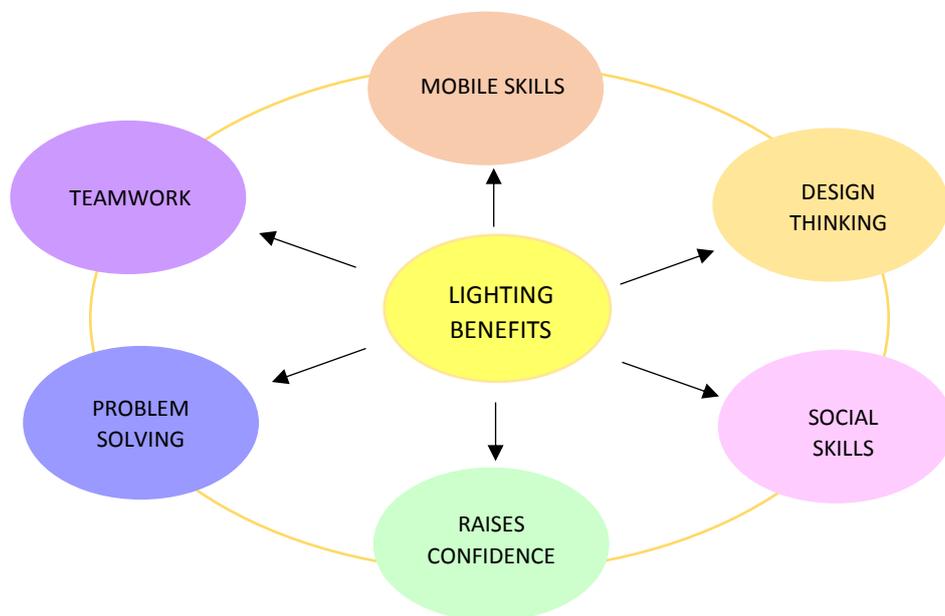


Figure 12: Benefits to children of learning about lighting. (Personal collection)

Our children today will soon become leaders and workers of tomorrow and as such we need to teach them how to think critically to solve future problems

(Guha et al., 2011). Along with the saying ‘*practice makes perfect*’, innovative design thinking of future adults and designers will be required to surpass our own design ideas and hopefully create more beneficial design outcomes for our future cities.

Lighting can be considered a valuable educational tool that inspires children within art and science subjects, from creating lanterns with jars and tissue paper to looking at the difference between direct and diffuse light (Shaw, 2016). Light is all around us, so people may think it's easy to understand, however lighting is a complex subject linking both the arts and sciences. A child's first experience of light should be focussed around the basics and presented in a fun, engaging way which allows the child to explore light and become motivated to learn more. By allowing children to explore light in their natural setting of play they can begin to form their own “*explorations of light and dark*” (Cavicchi et al, 2001).

To help fellow lighting designers introduce children to light, the Tool-kit of light (figure 13) was co-created with my young co-design partners. The Tool-kit and accompanying games manual (Appendix 2) demonstrates how the approach of play and kinaesthetic learning allows children to experience the complex subject of light through a playful environment. This tool has the potential to allow other children and groups to initiate learning about light through a playful environment, whilst the lighting designers gains a valuable insight into the creative thoughts of a child.



Figure 11: Tool-kit of light. (Personal collection)

## Conclusion

---

This study aimed to generate an understanding of lighting's place in a design project with children. Critical examination of previous children's co-design projects and the opinions of lighting professionals revealed that lighting could potentially have a place in the field of children's co-design. Various methods were tested, and it was concluded that as lighting is a complex subject some form of workshop is the most effective method to engage with children in their role as co-design partners. Workshops gave them a space to explore what they wanted to learn, and to assist in the decision making process.

Additionally, the research highlighted that a lighting education is important for children, as they not only learnt about some of the basic aspects of light but they also developed valuable social and mobile skills, along with critical design-thinking and problem solving. It can be argued that for children to learn successfully about lighting, a playful kinaesthetic manner needs to be approached to create the right environment for exploration and personal development.

To assist others in the promotion of lighting, a Tool-kit of light was co-created with the children of the Lighting Club. The Tool-kit can be utilised to help introduce the basics of lighting design to children, and critically teaches them about light in a playful manner. The Tool-kit also acts as a basis for other lighting designers to begin a children's co-design project; to engage and extract the wonderful and imaginative ideas that children have. The future of this project will continue in London, through further lighting workshops that introduce and raise awareness of lighting to children. Specifically, I aim to conduct light-walks around the city to get children thinking critically about the lighting, and to initiate discussions about future developments of the city. Furthermore, this project highlights how important light is and how light can inspire future generations to reimagine the city.

## Reference List

---

- Burkett, I., n.d. *An Introduction to Co-Design*, s.l.: Knode.
- Cavicchi et al, 2001. Playing with light. *Educational Action Research*, 9(1), pp. 25 - 48.
- Druin, A., 2002. The Role of Children in the Design of New Technology. *In Behaviour and Information Technology*, 21(1), pp. 1 - 29.
- Farber et al., n.d. How Young Can Our Design Partners Be?. *University of Maryland*.
- Grønbaek, K. I. O. K. K. N. K. A. L., 2007. Interactive Floor Support for Kinesthetic Interaction in Children Learning Environments. *Interact*, pp. 361 - 375.
- Guha et al., 2011. How Children Can Design the Future. *University of Maryland*.
- Hagen et al., 2012. Co-Designing with Children: Collecting and structuring methods. *NordDesign*, 22-24 August.
- Heals, 2018. *A Design History of Light*. [Online]  
Available at: <https://www.heals.com/history-of-lighting/> [Accessed 19 August 2018].
- Hedqvist and Svenle, 2014. *Century of the Child: Nordic Design for Children 1900 to Today*. Helsinki: Museum Vandalorum.
- Innes, M., 2017. *Teaching Lighting* [Interview] (11 July 2017).
- Jackson, 2016. *From Fire to Fluorescent: The Evolution of Architectural Lighting*. [Online]  
Available at: [https://www.architectmagazine.com/technology/lighting/from-flames-to-fluorescent-the-evolution-of-architectural-lighting\\_o](https://www.architectmagazine.com/technology/lighting/from-flames-to-fluorescent-the-evolution-of-architectural-lighting_o) [Accessed 19 August 2018].
- Lambert et al., 2013. Using a range of methods to access children's voices. *Journal of Research in Nursing*, 18(7), pp. 601 - 616.
- LeCompte and Schensul, 1999. *Designing and Conducting Ethnographic Research*. illustrated ed. s.l.:Rowman Altamira.
- Lozanovska, M., Leilei, X., 2013. Children and university architecture students working together: a pedagogical model of children's participation in architectural design. *CoDesign*, 9(4), pp. 209 - 227.
- Luxlive, 2016. *A Brief History of Light*. [Online]  
Available at: <http://luxreview.com/article/2016/06/a-brief-history-of-lighting> [Accessed 19 August 2018].
- Melonio and Gennari, 2013. *Co-Design with children: the State of the Art*, Bolzano: KRDB Research Centre for Knowledge and Data, Free University of Bozen-Bolzano.
- Shaw, J., 2016. Learning Objectives. *Lighting Journal*, Volume July/August, pp. 21 - 23.
- Shaw, J., 2017. *Teaching Lighting* [Interview] (11 July 2017).
- Shaw, K., 2017. *Teaching Lighting* [Interview] (11 July 2017).
- Thompson, S., 2017. Taught Behaviour. *Lighting Journal*, Volume February, pp. 42 - 44.

## Appendices

---

### Appendix 1: Lighting Professionals Interviews

To understand present lighting teaching methods and the role of lighting in education, I conducted interviews with lighting professionals who have ties to lighting education. Each interview consisted of similar questions which covered lighting teaching methods, raising awareness of lighting and skills that lighting could teach children, which will be analysed through several themes.

The four interviewees' all work in the lighting field but have diverse backgrounds, giving unique ideas and insight into teaching and lighting. *Malcolm Innes*, began studying tapestry before becoming a well-known lighting designer who practices in Edinburgh. He has educated university students at Undergraduate and Postgraduate level in lighting design at Edinburgh Napier University, including myself. *Kevan Shaw*, came from a technology background, beginning his lighting career in theatre lighting, before becoming a well-known lighting designer with his own practice in Edinburgh. He has also taught lighting design at Undergraduate and Postgraduate levels at Edinburgh Napier University.

*Jeff Shaw* studied architectural engineering before becoming a lighting designer. He is also the President of the *Society of Light and Lighting (SLL)*, who's agenda includes raising awareness of light and the career of lighting to children. Lastly, *Alison Ritter*, began her career in school teaching, before joining the lighting field. She has also conducted many workshops with adults and is looking to conduct more with children through her project '*The Challenge Kids*', which is a young lighting designer's competition tied to PLDC (professional lighting design convention). She is also one of the founders of PLDA (professionals lighting design association) and is heavily involved in the PLD (professional lighting design) magazine.

## *Lighting Perception*

Lighting has only recently been viewed globally as a profession, so I wanted to ask the professionals why studying lighting is beneficial in today's society. Malcolm talks about *"lighting as applied psychology"*; specifically lighting creates experiences for people and subtly *"manipulates how people see and feel in spaces"*.. On the other hand, Alison discusses the importance of light; *"we wouldn't be alive if we didn't have light but I think it's very interesting how you can use light to support human beings and not manipulate them"*.

Furthermore, Alison is fascinated with the *'non-visual effects'* of light, in particular how it effects our *"mood, health, well-being, and concentration"*. Additionally, Kevan articulates that with light *"you're not dealing with people's conscious experience of light but with the unconscious impact on their moods"*. Similarly, Malcom discusses that *"we store all our lived experiences of how light and colour works with materials and the environment"* and by creating new experiences we may come across something we could not have imagined.

## *Raising Awareness*

The lighting profession is unheard of in most Primary schools, but many adults have also not heard of it. Malcolm discusses people's reaction when he tells them he's a lighting designer, with most thinking that he is a product designer who manufactures light fittings. Jeff discusses this a *'lack of awareness'* in the lighting industry, as *"everyone in the industry falls into it by accident because they didn't know it existed"*. Kevan was one of those, whose Father worked with stain glass as a medium to manipulate light and tapestry to reflect light. He was exposed to working with light and was sensitive to the effects of light but *"didn't peruse it as a career path as he didn't know it was a possibility"*. Malcolm continues by comparing the profession of lighting with interior design; *"which exists all around us and is also recognised as a hobby, with books and magazines written on the subject"*, which includes occasional articles on lighting, however these articles

only reference *“new lamp shades, without talking about the quality of light in a space”*.

Malcolm expands on this by discussing that historically a lot of interior designers and architects have moved to the field of lighting when they were exposed to the career during university. Furthermore, he had considered creating a lighting undergraduate course in Wales, however this did not come to anything because he was unsure of where the students would come from. Jeff discusses this as a *‘chicken and egg’* situation, as high school pupils know very little about lighting. Malcolm concludes that there is nothing in the school subjects that prepares you for a lighting course, *“not even art, craft or design subjects”*.

However, there is the possibility of some aspects of lighting being taught in primary and secondary schools. Alison discusses how this *‘new knowledge of light’* will get out into the community through families, and then further to decision makers in the local government. Jeff continues, that *“if people know a career in lighting exists, then we’ll get a new pull of recruits in due course”*.

#### *University level lighting methods*

Presently, lighting design is only being taught at University level. Malcolm’s educates university students by first *“showing people how much they know about light through explaining the first principles”*. This is done through discussions on warm and cold light, where people begin to use some *‘lighting vocabulary’*. Which demonstrates that people already know something about lighting, thus engages and motivates them to learn. Furthermore, Malcolm discusses how beneficial model making is as an approach, as it allows the students to work in a *‘hands-on’* way to test ideas as the *“models create an experience of what that light would look like in the space”*.

The key messages Kevan wants to communicate to people studying lighting are the aspects of seeing, feeling, and manipulating light as *“people may have had some experience of light”*. Kevan works through a process, depending on their stage of learning. He begins with getting them to look for

light, then learning about the technology, before getting them to use light to re-create something.

In the first stage of Kevan's process he sends his students to Art Galleries to find images of art which have "*particularly interesting light*", and makes the students explain why the light is interesting. Next, he gets the students to re-create surrealist work, for example the '*Carrot in the beer bottle*'. Although this is a fun activity, it also teaches the students about the nuances of colour, the source of light and how to manipulate light. Kevan believes that this is the best approach to start training students' eyes to understand light.

Malcolm discusses other design courses where "*there is little lighting taught in architecture programmes, only two-hour lectures at University level*". Malcolm advocates the lecture based approach as it allows the educator to get across "*large volumes of information*", however the quantity that students absorbs is very little. Therefore, he has always been torn between lecture and 'hands-on' based teaching approaches. Subsequently, this year he has adapted his approach to include more 'hands-on' learning, which has led to his understanding that "*it's better that the students leave with a willness to go off and do their own research, than to bombard them with information in a two-hour lecture*".

### *Lighting Workshops*

Malcolm discusses how there are more lighting workshops than lighting courses, as they allow people to experience a "*little taster of lighting*". He continues that lighting workshops are globally popular because they "*give the participants free rain and encourages them to try out new things*" however, they are hard work to organise. Alison understands this as she has organised over 40 lighting workshops with lighting designers and students. She invited lighting professionals to lead the workshops, but because few had teaching experience she had to give them some necessary teaching information.

Furthermore, she continues that workshops are not only about learning but about creating worth-while experiences.

Kevan concurs that workshops are the best way to teach lighting but only if you're "*savvy enough and focussed on the educational aspect*". You also need a set of tools and a theme which does not sway the exploration, "*as it's the concept and the theme that's explored in the workshop, which needs to come from the students as it's the most important learning aspect*". Kevan believes that this approach is a great way to teach people what a concept is. Furthermore, the workshops are also about understanding the processes involved and the story you are telling through light.

#### *Adaption for children*

Current lighting teaching methods are developed for university level students, therefore they would need to be adapted for children. Kevan thinks that the "*intellectual side of lighting would not be appropriate*" for younger children, so suggests re-working his process for school aged children, instead sending them to galleries to find a picture to study and then asking the children their opinion on the light. Alison has done something similar during a workshop at the art history museum in Vienna. The workshop was for adults but a group of school children around 10-11 years-old were also in the gallery. She approached the children and asked what they thought about the art-work, their responses were very clean, honest, and open, showing understanding of the narrative of the paintings. Alison believes that "*it's right to go as early as you can*", in teaching lighting because younger children are keen to learn and can absorb more information. She continues that it is important to ask children what they think, as otherwise people usually just tell the children what to do.

### *Lighting as a school subject*

This leads to the discussion on where lighting currently sits in school education, 'does lighting fall under art, science, or craft?' Alison talks about lighting in primary schools where "they generally learn the physics of light, the sun, the moon, why shadows are longer at certain times of the year but they don't learn anything about the effects of light". Kevan adds, that when he was at school, "there was only lighting in science, in physics lessons and this only occurred at secondary school".

Jeff believes that lighting belongs in both art and science, which is why he chose to do lighting as he did not "want to just do something that is just art or science based", he wanted a bit of both. Kevan elaborates that there are aspects of light in art, science, and craft but "you need to understand the principles of the laws of physics for light before you can do anything sensible". Alison also believes that design is not just about your intention but you need to know what you're doing to work with light.

Alison argues that "lighting is a mixture of art, science, and craft", and that lighting is scientific through "the physics of daylight which belongs in the field of science". She continues that "the art of doing something is not necessary an art in the sense of paintings" but in the way you do things.

Malcolm sees how lighting belongs to each aspect, as some practices such as design or engineering can fit into art and science. However, there are some divergents such as Leonardo da Vinci who was an artist, inventor, engineer, scientist, mathematician, and anatomist, who did not fit into just one box. Malcolm also discussed how designers place themselves into boxes by proclaiming "I'm a graphic designer, I only do graphic design". Alison has also noted this and talks about lighting becoming "more interdisciplinary, something that is in motion all the time". She also observes that "children are in motion all the time", which highlights how important children are in "reading off the success of the next step in the progress". Furthermore, she believes that

*“things are going to change a lot and we need to grasp children's attention so that they can still apply things in a way that's positive for them”.*

As previously discussed lighting bridges the arts, sciences, and the craft, but should lighting have its own subject in schools? Jeff believes that it depends on the level, i.e. primary or secondary. He acknowledges that lighting could be taught as an aspect of science, design, and art, as it can be applied to all of them. Furthermore, he does not view his role as teacher, but as showing the children how light can be used as one of the tools in art and science, so that children might become interested in lighting later in life.

Alison concurs that the emphasis should not be on teaching lighting design, *“as you can't make a school child a lighting designer, but maybe they should be made more aware to the importance of light in school through workshops and lessons”.* Jeff continues by explain how *“engineering or architecture disciplines are not fundamentally taught at school, but children are taught the building blocks”.* Kevan also agrees, he thinks that you should get children to start playing and learning about lighting, and teaching them to *“find their own answers earlier on”*, which will help later development.

Malcom sees it as a 'chicken and egg' situation as *“you need the teachers to appreciate that there is something worth knowing about light”.* He continues that the best and only way to get lighting into schools is to subvert the science subjects, by using science to discuss lighting design. Alison agrees that this would be beneficial, as it would make teachers and pupils aware of the best methods to apply lighting differently at home, whilst being conscious of light and lighting solutions in schools.

*Who should teach lighting?*

If children were to be taught about lighting at school then it is important to consider who should teach the subject. Jeff discusses how the SLL encourages lighting professionals to go into schools and demonstrate practical examples

of how lighting applies to the real world. Alison agrees, however she warns that professionals should be *“young and easy going so will respond to the children and grab their attention,”* and not someone famous who will just stand up in front of the class and talk. She also thinks that both lighting professionals and teachers should work together as *“you can't take the teaching away from the teachers as it's important that they know what all their kids are thinking and doing”*.

Alternatively, the teachers could be educated with the necessary lighting knowledge. Jeff believes that it would be beneficial to give them some bits and pieces about the niche field of lighting. Alison concurs and discusses how this is something which she is considering for her *'The Challenge Kids'* project. Where she is working with a French designer to design learning modules for the teachers, *'a how to teach lighting to children'*. This requires that the teachers undertake the same learning process as the children, so that they understand what knowledge they are imparting.

### *Teaching Environment*

The lighting professionals have discussed the need for lighting to step out of the academic environment due the requirements of where lighting teaching should take place. Kevan discusses how lighting methods are not traditional academic practices and as such *“you need to be able to work in a less formalised academic way even if you are working in an academic environment”*, in order to get the desired results and experiences. Kevan concludes that the right environment needs to be a large practical space to play with light, but also with some darkness.

Alison also discusses stepping out of the educational environment, but stresses that it is important that the children and their parents, trust the person they are working with. Once trust is established then field trips could be undertaken, for example the children could be taken out on a lighting walk during winter time, through the town, where lighting features could be discussed. Alison explains

how field trips are important because they apply lighting concepts taught in workshops to the wider world.

Similarly, Jeff talks about moving from an educational setting into a workshop environment, which the SLL put together every two years. Jeff describes the event as a “*practical thing where people mess around with light fittings at night time*”. These workshops are held in specific locations instead of a classroom.

### *Playful exploration and Kinaesthetic learning in lighting*

Previous discussions on kinaesthetic learning and the use of play to assist children's development and learning, lead me to ask the professionals their views on these ideas, particularly if these methods could be adapted to teach children about lighting. Alison believes that play and exploration will help the children understand how lighting equipment works. However, before they start to play with light the children need some background information, which they are encouraged to collect via their own research. Kevan concurs that play and exploration can have a place in learning about lighting, “*as long as it's directed*”. He continues that play can help you discover alternative ways of tackling problems.

Malcolm agrees and elaborates that the workshops are the “*ultimate example of play and exploration*”. He continues that the real benefits of play are that “*we are giving ourselves new experiences*”, which may not be immediately helpful but may be beneficial in the future. Alison continues that the playful environment will catch the children's attention. Once this is achieved we need to talk to the children to make sure that they are learning and thinking about lighting processes.

Malcolm believes that physical activities improve learning, but it is not the most efficient approach to communicate large volumes of information. Alison compares kinaesthetic learning with ‘*frontal lessons*’, book and lectured based

approaches, which are “*pretty boring unless you’re telling them something really interesting*”.

Alison believes that kinaesthetic learning has a place in lighting education. However, motivating people is crucial and this comes from ‘*blended learning*’ which uses diverse learning approaches such as going outside, frontal lessons, working in pairs and practical workshops. Overall Alison believes that participation is key in the learning process. Jeff agrees, and believes that demonstrations of different lighting effects excites people, especially children.

Malcolm continues that kinaesthetic learning is a good way to adopt the trial and error approach, whilst testing a possible solution you “*might find something even better accidentally because you tried it, however, if you sit in your bubble and design in your head and just calculate it, you miss lots of opportunities*”.

### *Thinking and Skills Development*

Design utilises both problem solving and design thinking, thus lighting workshops will encourage children to develop these skills. Furthermore, the lighting professionals explained how problem solving and design thinking are important in design, and can be beneficial for the children. Malcolm states that “*all design is problem solving*”, Jeff concurs and elaborates *that this is what we do*”.

Malcolm discusses that sometimes the solution to a problem may not be a lighting one, so as designers we need to adapt to problems which are not part of our specialism. Kevan concludes that he has recently been working on ‘*advanced technical problems*’, which are only going to increase as lighting becomes more technical, bringing with it a bigger set of challenges.

Malcolm discusses that there are “*particular skills within design*”, some of which are unique to certain specialisms, but problem-solving crosses multiple disciplines. Malcolm concludes that the ‘*raw principles of design*’ are

transferable, which Jeff thinks is an important principle for school lighting education.

Kevan discusses that there are many aspects in lighting which should be done in the head rather than on paper/the computer. He associates this idea with '*design thinking*', the conceptual stage where ideas are generated. Subsequently, problem-solving is involved in implanting these ideas. Kevan also notes that there are two types of problems which must be solved; first the '*the design problems*' and then the '*practical problems*'.

Malcolm believes that design thinking is "*not about creativity, it's about creative solutions*" and unique ways of achieving tasks. He emphasises that there is no right answer in design, instead there are multiple ways of reaching a goal. This contradicts what children are taught in schools. Malcolm also observes that children are brought up believing that there is a right answer to everything, as it's the "*easiest way to test knowledge*". For example, in maths lessons children are taught the '*correct way*' of doing sums and any other way is wrong. However, some people see more creative and unique solutions to solve problems. He continues that "*design thinking is about looking beyond the immediate problem*", whilst also understanding the divergence between scientific and engineering thinking.

# MANUAL OF LIGHT

Annabelle, BLAITH  
by Emma, Catriona

GAME 1: DRAW A PICTURE OF LIGHT.

ANNABELLE:   
DO COPY. DRAW STUFF  
THAT LIGHT COMES FROM.

ABEL IT SO PEOPLE KNOW  
WHAT IT IS. IF YOU WANT

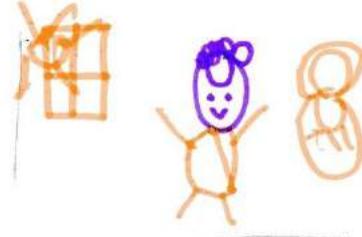
TO DRAW LANTERN DRAW  
A CIRCLE. DRAW HANDLY BIT THAT YOU CAN  
HOLD ON TO IT. THEN YOU DRAW A YELLOW  
BIT INSIDE TO SHOW LIGHT. DRAW CIRCLE  
AT BOTTOM TO SHOW INSIDE & OUT.

CATRIONA -   
BLAIR - 



GAME 2: WHERE'S THE LIGHT?

SEE WHERE LIGHT IS COMING FROM, POINT TO IT. DO ARROW TO WHERE THE LIGHT IS GOING.



FIND ALL THE LIGHTS IN THE ROOM, ARROW THEM. LANTERN WITH LIGHT INSIDE.

CATRIONA - 9 stars

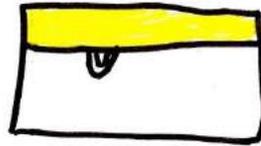
BLAIR -

ANNABELLE -



GAME 3: MATERIAL BOX

GET BOX & CHOOSE LOTS OF MATERIALS. PUTTING MATERIALS IN & CHOOSING WHAT'S WHAT. BOX WITH



LOTS OF CUT OUTS - DIFFERENT MATERIALS + LIGHT SEE WHAT HAPPENS. GOLD BEST MATERIAL.

CATRIONA - 10 stars

BLAIR -

ANNABELLE -



GAME 4: BLOCKS

CATRIONA - 8 stars

FULL BLOCK WITH WATER

3 SEE WHAT - LIGHTEST ONE - RAINBOW BIT WITH WATER. TWO BLOCKS -



SHINE LIGHT THROUGH SOLID - DOESN'T GO THROUGH - BIG BLACK SHADOW.

TRANSLUCENT BLOCK - BASICALLY SHOWS IT COLOUR & SHADOW

BLAIR -

ANNABELLE - 9 stars



GAME 5: BUBBLES

PUT ON GROUND & SEE  
IF THEY MOVE OR NOT.

LIGHT MADE BUBBLES

COLOURFUL - MADE NICE SHADOW.

LOOK NICE WHEN REFLECT - PUT TORCH  
TO GET RAINBOW STRIP. MOVE TORCH ROUND

BUBBLES

CATRIONA - ~~4~~ 9 stars  
BLAIR - ~~4~~ 9 stars  
ANNABELLE - ~~4~~ 9 stars

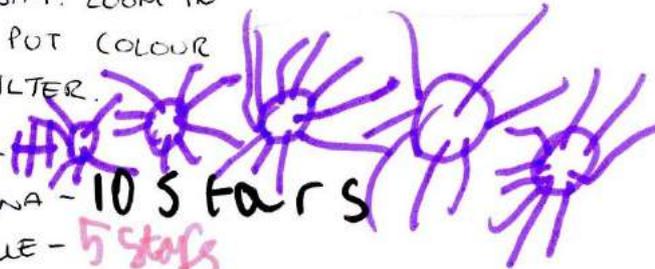


GAME 6: STENCILS

STICK THEM ON BIG  
TORCHES. HOLD IT

FAR AWAY. ZOOM IN  
& OUT. PUT COLOUR  
ON. - FILTER.

BLAIR - ~~4~~ 5 stars  
CATRIONA - 10 stars  
ANNABELLE - 5 stars

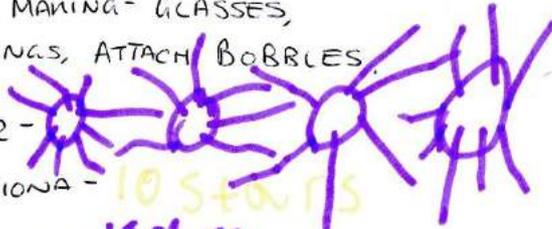
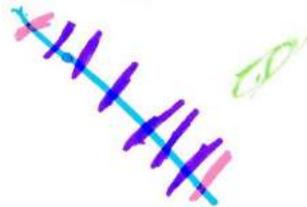


GAME 7: GLOW STICKS

THEY LIGHT UP. MAKE  
EARRINGS. WHAT COLOUR  
- MIX GLOW STICKS.

TRY MAKING - GLASSES,  
EARRINGS, ATTACH BOBBLES.

BLAIR - ~~4~~ 10 stars  
CATRIONA - 10 stars  
ANNABELLE 10 stars





by Sophia

ME 1: DRAW A PICTURE OF LIGHT

Draw a picture of light, it can be anything that light or produces light - anything you can think of!  
One picture or lots of pictures is fine.



Candle



ME 2: WHERE'S THE LIGHT?

Can you work out where the light is coming from and where it is in the picture?  
Hint: Look at the shadows!



### AME 3: MATERIAL BOX

Cut out 5 equal squares then cut out any  
them by either folding, cutting or just cutting,  
in tape the edges together to make a  
or without a lid. Use the torch to see  
the shadows and patterns.



You can use foil or coloured plastic too.

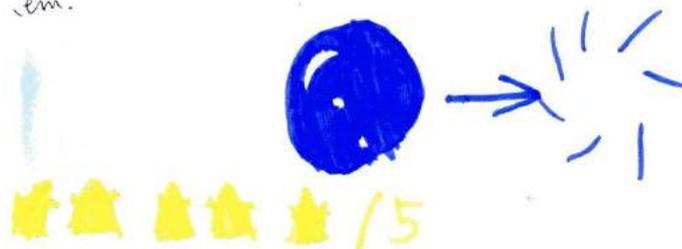
### AME 4: BLOCKS

Try out shining your torch on the different blocks.  
objects that are useful - opaque, transparent,  
reflective. Try shining on shiny paper, coloured  
sheets and dark sheets. Try crumpling the paper.



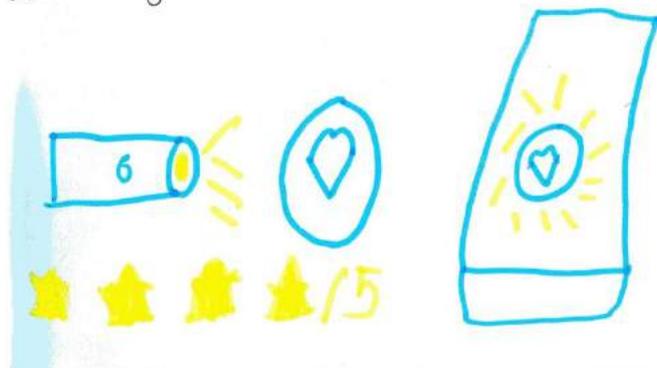
### AME 5: BUBBLES

1. can blow the bubbles then catch one with the stick.  
2. sit gently on the floor, put a see through block beside  
and then shine the torch through the bubble and  
block. What do you see?  
3. blowing the bubbles up <sup>high</sup> and shine the torch on  
them.



### ME 6: STENCILS

Place the stencil in front of the torch. Try moving it  
backwards and forwards. Does it work better if the  
room is light or dark?



### ME 7: GLOW STICKS

Use the glow sticks a lot until you don't heat much  
anymore. Then you can bend them and use the  
connectors to make a light sculpture. It can be  
2D or 3D. If you want to have a memory then  
make a picture because they fade out.

