

Manual for delivery of LEGO® based therapy (*play brick therapy*) for the I-SOCIALISE Randomised Controlled Trial (RCT)



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In the research trial it was mandatory that facilitators took part in training. We would strongly encourage this also in real world practice. The facilitator role in this therapy is usually taken by a teacher or teaching assistant. It does however utilise a different approach from some main strands of traditional teaching approaches, moving away from didactic or instructional teaching and giving the children and young people responsibility for resolving differences of opinion and problem solving of differences of opinion during brick building or social challenges. Hence the training sessions, which gives multiple opportunities to practice these techniques, are invaluable.

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Chapter 1: Introduction to LEGO® Based Therapy (*Play Brick Therapy*)

This guide was written for professionals involved in the I-SOCIALISE research delivering LEGO® based therapy within a school during the research period (September 2017-June 2019). LEGO® based therapy was developed to support social interaction skills in young people with autism spectrum disorder.

In agreement with the manufacturers of LEGO® the terms LEGO® based therapy was allowed for the duration of this research project funded by the National Institute of Health Research. There was an agreement that at the end of the project in line with the LEGO® 'Fair Play Policy' the term LEGO® based therapy would be supplanted with the more generic terms '*Play Brick Therapy*' recognising that any play brick can be used for this collaborative therapy using play with building bricks. This research has been entirely independent and no funding of any kind (including LEGO® equipment) was donated or forthcoming from the makers of LEGO® or any other toy building brick manufacturer.

The original idea of using LEGO® bricks to help children with autism spectrum disorder improve their social competence was developed by Dr Daniel LeGoff, a Clinical Neuropsychologist and expert in autism spectrum disorder. One key aim of this social skills teaching approach is that the intervention should be fun and engaging for the children taking part.

Detailed background about LEGO® based therapy has been described in the following books, and the interested reader is directed to these for further information:

LeGoff, D. B., Gomez de la Cuesta, G., Krauss, G., & Baron-Cohen, S. (2014). LEGO® based therapy: how to build social competence through LEGO® based clubs for children with autism and related conditions. London: Jessica Kingsley Publishers.

LeGoff, D.B. (2017). How LEGO® Based Therapy for Autism Works. London: Jessica Kingsley Publishers.

Research so far suggests LEGO® based therapy may be helpful in improving social skills for some children with autism spectrum disorder. However, the evidence base is in its infancy and further research is needed before we know how effective this intervention is. We still do not know the answers to questions such as, "How often?", "How long?", and, "With whom?" I-SOCIALISE is a large randomised controlled trial of LEGO® based therapy with 240 children is currently underway in the North of England. This research will be finished in 2020.

The current guide is aimed to be a brief, practical, step-by-step guide for trained practitioners wishing to have a reminder of how to deliver the therapy for the I-SOCIALISE research trial. It is hoped that by providing a simple, step-by-step guide, that LEGO® based therapy will be delivered as intended with as high quality as possible.

The Main Principles of LEGO® Based Therapy

LEGO® based therapy involves collaborative play where children work together to build and use LEGO® creations. Sessions involve at least three children with one adult facilitator trained as part of the research (*‘facilitator’*) in each group. Children work together (usually in teams of three) to build the sets (models). The task of LEGO® building is divided into different roles, which means social interaction is necessary to take part.

By doing this, children practice the following key skills:

- Working together
- Taking turns
- Sharing interests
- Sharing achievement
- Having fun together
- Specific social skills such as greetings, eye contact, sharing etc.
- Establishing, understanding and following social rules and group rules
- Role switching
- Jointly attending to one activity
- Learning how others respond in collaborative play
- Practicing reciprocity
- Developing their listening skills and communication skills

There are also a number of more complex skills that are addressed such as:

- Resolving conflicts to mutual benefit
- Expressing oneself to others
- Receiving feedback from others
- Negotiation
- Compromise

One of the advantages of learning and practicing these skills using group LEGO® play is that children are learning in an actual “live” setting in an enjoyable and motivating activity.

The Ethos of LEGO® Based Therapy

LEGO® based therapy should take a positive approach to the young people attending the sessions. The emphasis is a positive, “can-do” attitude. Rather than focusing on a child’s lack of social competence, the focus is on how well the children can build LEGO®. Learning social skills comes alongside having fun building LEGO®. Most of the children who have participated in LEGO® based therapy appear to be happy that the activities are so clearly defined, as well as relieved about the social expectations, “We build LEGO®? I can do that!”. This ethos builds a child’s self-esteem, by noticing their strengths rather than their weaknesses.

LEGO® based therapy emphasises social identity development. Sometimes, young people with social communication difficulties can be isolated and lonely. In creating a sense of common purpose and shared interest in LEGO®, children start to feel that they belong to a group of friends who are like them. Also, LEGO® is a hugely popular toy amongst children of all ages. Being a member of a LEGO® group gives the young people something to talk about outside of the session with their peers. This will open up further opportunities for conversation and social interaction outside of the therapy setting.

Who will be delivering LEGO® based Therapy in the I-SOCIALISE research?

LEGO® based therapy is delivered in schools in this research by staff who have attended specific training by someone trained by the research team on how to deliver the intervention. These ‘facilitators’ need to have experience of working with children on the autism spectrum and understand their needs.

To ensure that LEGO® based therapy is delivered in the same way across all schools taking part in the research, everyone delivering the therapy will receive specific training from their Local Authority and read this manual in order to understand how to run LEGO® based therapy groups.

The facilitator running the LEGO® based therapy groups should use the following attributes:

- Professional knowledge and experience of working with children with autism spectrum disorder and the individual children attending the sessions
- An enthusiasm for LEGO® and if possible some experience of LEGO® building (e.g. as a child, or adult fan of LEGO®, or with their own children!)
- Patience and passion for enabling young people to develop and explore their own abilities, strengths and vulnerabilities
- The ability to tolerate a certain amount of chaos to allow the children the space and time to take ownership of the group activities and attempt to solve their own social difficulties

The role of the facilitator in LEGO® based therapy is to facilitate children to learn about social communication and social interaction. The facilitator does not *tell* the children how to do it correctly, but instead highlights problems and prompts children to come up with their *own* suitable solutions to social difficulties. This is an important element of the approach which requires the facilitator to act as a mentor and leader rather than telling children how to do things. The role of the facilitator is also to identify, praise and highlight all the amazing LEGO® building and social interaction skills that happen in the group. See Chapter 4 for more information about the role of the facilitator.

Understanding Children with Autism Spectrum Disorder

For facilitators running LEGO® based therapy with children with autism spectrum disorder, it is important to have a good understanding of autism spectrum disorder. They will have been on courses to help them understand autism spectrum disorder and what approaches to use when working with children on the autism spectrum. This will include some autism awareness as part of the LEGO® based therapy (*Play Brick Therapy*) research being carried out here. There are many excellent books on the subject, many published by Jessica Kingsley, and the National Autistic Society website (www.autism.org.uk) has a wealth of information. Here, we briefly outline some of the important considerations when working with children with autism spectrum disorder for those running LEGO® based therapy groups.

Empathy (theory of mind) delays

Children with autism spectrum disorder have empathy delays. Their understanding of the minds of other people is delayed and they therefore may struggle to guess the other person's point of view. In joint play they may not understand another child's wishes or hopes (e.g. to play with a certain toy) and they may not see another child's disappointment. These understandings usually motivate most children to change their behaviour or share, but for children with autism spectrum disorder they will need more support from rules, routine and supported discussion and negotiation. One child who was asked by his friend who was not a very fast runner 'why do I always come last in races?' at the school race day, replied 'because you are fat and you cannot run very fast'. He was not intending to be insulting. He was stating the world as he saw it and he did not understand why his friend was upset. It is important to explain the perspectives of others when giving social information. For example:

Facilitator: Hey John, you and Bob and Tim have finished that plane.

John: Yeah

Facilitator: It looks great.

John: Yeah it is.

Facilitator: Bob is smiling. He looks happy to have made a good model.

John: Uh.

Facilitator: Do you think Bob looks happy, John?

John: Yeah Bob looks happy.

Tim: I'm happy too.

Positive language

Research using Social Stories™ has shown it is not particularly helpful, and usually counterproductive, to use very negative language when trying to support a child on the autism spectrum to engage positively and socially with others. Telling a child what not to do does not help them understand what to do or why it is helpful to do that thing. Using terms like 'shouldn't', 'don't' etc. are therefore unhelpful and if a lot of this happens it creates a negative atmosphere for learning. We would therefore encourage therapists to be very constructive in their use of language, supporting the child to understand and practice what they should do, rather than telling them what not to do.

Not so good example:

Facilitator: Don't snatch the brick off John, Bob.

Bob: I need it.

Facilitator: Yeah but you shouldn't do that. John doesn't like it and I don't like it.

Better example:

Facilitator: Hey John, what just happened?

John: Bob took the brick off me.

Bob: I needed it.

Facilitator: Hey everyone, what do you think Bob could have done differently?

Tim: He could have asked John.

Facilitator: Would that have helped John?

John: Yeah.

Facilitator: Good suggestion.

Getting the gist

Children on the autism spectrum have delays in 'getting the gist' (Williams & Wright, 2003) which is related to 'drive for central coherence' (Frith, 1989). Children on the autism spectrum often miss the social meaning of something or miss the point or do not fully understand why adults may or may not want them to do any particular thing at any particular time. For example, telling a child 'do not use rude language' may not be helpful since a child on the autism spectrum may have very little idea what rude language is, and may have limited theory of mind or empathy skills to understand why any particular word or phrase might be perceived as rude by another person. Very often they are just stating the obvious.

Simple language

The other thing to bear in mind is that children with autism spectrum disorder are often quite literal and may have high expectations that something will be similar or the same as it has been in the past. This means that language needs to be simple and straightforward. Avoid using abstract language when you want the meaning to be clear. For example, a teacher was trying to encourage a child on the autism spectrum to comply with circle time because the child frequently wandered out of the group and around the classroom. At one point the teacher said: 'so you don't want any lunch then?' Not only was this abstract language, but implied the potential consequence for the child doing something or not doing something (this was not stated), and the child had absolutely no understanding what was being communicated.

In summary:

- Keep communication short and simple
- Keep communication clear
- Language that is abstract may be difficult to understand
- Irony and sarcasm can be difficult to understand
- Be positive
- Be factual where possible

Chapter 2: Getting Ready

When to run a LEGO® group

LEGO® based therapy groups can be run as an after school club, lunch time club or as a lesson. A typical session is 60 minutes but can vary if right for the children (between 45 to 90 minutes). Sessions are usually held once a week and run for at least 12 weeks. Children should be encouraged to attend all sessions but 6 sessions is regarded as an absolute minimum. This is needed to establish consistency, familiarity with the group and LEGO® building tasks and to start to see a small amount of progress in social interaction.

How many children should be in the group?

Each group has 3 children and at least one facilitator. Sometimes six to nine children can be in a large space with 2 facilitators. Three children is optimum but if one child does not turn up (for example they are ill) it is ok to carry on the session with two children. Mostly, three children work together to build a model (see later) but sometimes later on in the therapy, towards the end of a session (when the model is finished) two groups can mix to encourage social interactions and joint play with another group (this is described later).

Equipment you need

You will need the following resources to be able to run a LEGO® based therapy group:

- Facilitators (1 adult per 3 children is a good rule of thumb)
- A quiet room with table and chairs
- Small prizes (optional)

The research team will provide the following which will be passed on to another school at the end of the 12 weeks therapy:

- LEGO® sets with instructions
- LEGO® bricks for creative freestyle building (if needed)
- Storage boxes for organising the LEGO®
- Plastic trays to tip bricks onto (e.g. school dinner trays)
- A poster of the rules
- Role cards for the different roles of *Engineer, Supplier and Builder*
- A reward chart
- Certificates (provided electronically to personalise with the child's name and then printed)

Selecting Children to Participate

For this research, children with autism spectrum disorder in mainstream schools are being included.

Age Span

There is no particular hard and fast rule about this, but it is appropriate to put children together who are developmentally at similar levels. It will be important that children can communicate with each other and feel comfortable with each other.

Gender

Our experience is that mixing children of different genders works well. Do not presume that LEGO® is only for boys. Girls love LEGO® too!

Social Communication Problems

This therapy was designed for children with social communication problems. Our experience is that it is not just children with social and communication problems who enjoy LEGO® based therapy, but we know that it improves the skills of children with autism, ASD, atypical autism and Asperger syndrome. In this research we will include children on the autism spectrum, but if there are spare places then other children will be included with parental permission if those children are willing. These may be children with social communication problems (without autism spectrum disorder) or healthily developing children (e.g. peers as positive role models in the group), if this feels appropriate and useful. LEGO® based therapy is flexible, so that you can use your professional judgement and knowledge of the young people you work with to plan for the set-up that will best suit the individual children.

Minimum skill sets that children will need

To participate in LEGO® based therapy, children need to have an ability to communicate with each other at a simple level. This needs to involve some spoken language or sign language if participants are deaf. They would for example need to be able to tell each other what shape and colour of bricks they may need in the building process.

There may also be some minimal requirements in concentration ability. If the child cannot concentrate in order to build a very simple LEGO® model on their own then they are unlikely to be able to participate. They may need to wait until they are older while joint attention and concentration skills have developed further.

Mixing children with and without difficulties

As described above, the children in the groups for this research will usually be children on the autism spectrum. If there are not enough children on the autism spectrum in the school who wish to participate this is fine. It is fine to have some children with other social and communication difficulties working together or healthily developing children. There may need to be some

consideration given to the temperament of different children to try and set up groups that can work together constructively and positively. It is fine to consider this carefully.

Are there some children for whom LEGO® based therapy is not helpful?

As with all therapies, there is a time and developmental age that is most appropriate for each child. Children get something out of this therapy if they are able to concentrate and participate in some form of collaborative play, and that they have the developmental and cognitive skills to be able to build on this. In our experience, children with significantly high levels of frustration or anger or distress when they cannot do something that they want to do (that results in frequent temper tantrums or aggression) do not do well in LEGO® based therapy. Similarly, children with significant attention and concentration problems or children who are very impulsive or distractible do not do well if there are six hundred pieces of LEGO® to put together. A range of alternative therapies may be more appropriate for them; until they have reached a development stage where LEGO® based therapy could be helpful.

To be part of the research, children need to meet the following criteria:

- Have a clinical diagnosis of autism spectrum disorder
- Be aged between 7-15 years (15 year old children currently in year 11 are not eligible)
- Attend a mainstream school
- Be able to communicate and follow simple instructions
- Have the dexterity to build LEGO® sets
- Have not attended a LEGO® based therapy group in the current or preceding school term

Children with very limited social communication and severe language delay or non-verbal children may need to develop further before they are able to enter a group. You may like to consider the book “Building Language Using LEGO®” (Ralph & Rochester, 2016) for ideas of using LEGO® bricks to develop speech and language in children with communication difficulties.

Children who dislike LEGO® will not benefit from LEGO® based therapy. If a child has little experience of LEGO®, then you can offer some 1:1 sessions to show them LEGO® and decide whether or not they will enjoy the group LEGO® play, but if a child actively dislikes LEGO®, then even if they are on the autism spectrum, this approach will not be for them. You can easily adapt the ideas of having different roles to suit other materials (e.g. cooking, Meccano, K’NEX) if these materials are preferred by the child.

Choosing the LEGO®

In this research various LEGO® kits are being provided. They are available for different age ranges and the research team will discuss with you which kits will work best for the children in your group based on their ages, genders and interests. We have added a list of popular LEGO® kits for each age range at the end of this manual.

In general the following principles apply:

Models with instructions

Dr Daniel LeGoff describes that on average, a ten year old child can put together a LEGO® set involving six hundred pieces in approximately 60 minutes. It might take children with a developmental age of 4 years approximately 150 minutes to do the same thing (LeGoff et al., 2014). This is a useful benchmark when planning groups. LEGO® models usually have the number of pieces written on the side so that you can work out roughly how long it will take. Also, building the models yourself beforehand is very helpful to ascertain how easy the model is and whether there are any tricky tasks.

Choosing the materials and sets is a key part of the therapy and should be done by the children in the session. At the beginning of the group it is important to have some of the LEGO® sets you have been given ready for the children to explore and decide between. These models should be age appropriate. You will need to know what LEGO® individual children enjoy and also to have discussion with the group as a whole. All LEGO® models will have specified age ranges and the number of pieces involved. Early on, groups start with smaller sets and you will quickly be able to work out the number of sets that will be able to be completed in the time allotted.

Freestyle LEGO® material

Once the children have built the sets there may be time for other more freestyle building. If your school currently does not have any freestyle LEGO® available the research team can supply you with some. A large supply of free style materials is helpful for free play at the end of session. You can get donations or buy bricks especially for creative building (e.g. LEGO® Classics). Children should be encouraged to work together to build their own creations with the bricks available. Bricks should be organised according to size, shape and colour.

Maintaining integrity of sets

It is very common for small pieces to get lost. Children on the autism spectrum can become very distressed if significant pieces are missing from sets. If at the end of a group you find a piece missing, go searching for it and if you cannot find it then make a note with that set that it is missing and needs replacing. Individual bricks can be purchased from the pick-a-brick section of the LEGO® shop website. Talk to the research team about this if you need help.

Organising the LEGO®

The LEGO® should be organised in a coherent fashion that makes it easy to find the right bricks. Freestyle bricks (as opposed to specific model sets) should be organised according to colour, shape, size and/or function. Sets with instructions should be stored in plastic boxes with lids, to ensure pieces are not lost. Do not mix bricks from sets with instructions with the creative freestyle models as the pieces are more likely to get lost.



An example of Freestyle LEGO® organised by colour

Setting up the room

Children on the autism spectrum work best in environments that are quiet, without too much distracting sensory information (noise, lights, lots of people). Children on the autism spectrum will feel more comfortable if they use the same space regularly rather than trying to use different rooms on each occasion. A quiet area in the room with a bean bag is helpful.

If LEGO® based therapy is to be a regular thing it is best to use the same room each time. See if you can find a designated room. This could include safe places to store the materials and the LEGO® and appropriate table top spaces.

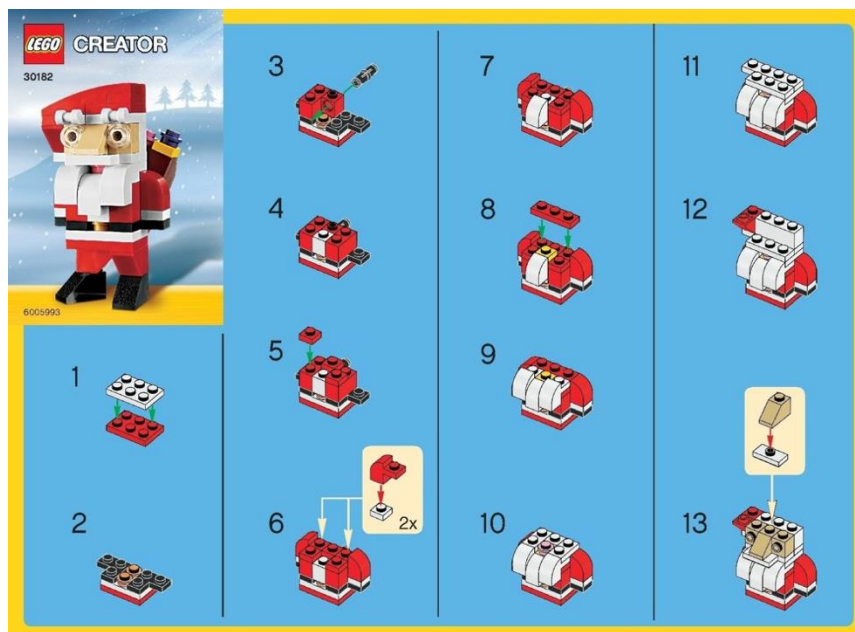
Chapter 3: LEGO® Based Therapy Basics

The key to LEGO® based therapy is building LEGO® collaboratively. At home, children usually have a LEGO® set with instructions and build by themselves. However, in LEGO® based therapy you must build with at least one other individual and split the tasks.

There are two main types of activity: Set building and Freestyle building.

Set Building

A major part of LEGO® based therapy is building sets following the instructions. The research team is providing these sets. They come in a box with all the pieces needed to put the model together and clear, numbered step-by-step instructions showing you pictures of how to build the model.



An example of a LEGO® kit instruction manual

In LEGO® based therapy the children build in teams. The role of creating the model is divided up into a maximum of 3 jobs: Engineer, Supplier and Builder.

The Engineer

The Engineer looks at the pictured instructions for how to build the model (though all members of the team can see the pictures). They describe which parts are needed (see “describing bricks”) and where to put them according to the instructions. The Engineer must describe pieces and where they go verbally, using the picture to help them show what the piece is and where it goes. The aim is to use both the picture and verbal descriptions, pointing and showing, together.

The Supplier

The supplier listens to the engineer's description. They then search through the bricks to find the correct one. The supplier often sorts the pieces out ready for them to be found easily. The supplier then passes the correct piece to the builder one piece at a time.

The Builder

The builder receives the piece from the supplier and puts the model together based on description from the engineer and the picture in the instructions.

Switching Roles

Children can swap roles throughout the set building so that they each get a turn at the different jobs for each model that is built. LEGO® instructions are numbered so the group can decide to swap jobs after a certain number of steps, e.g. "we'll swap after step 5". Sometimes groups divide the steps into 3 (e.g. swap after 20 or 40 steps if the model is 60 steps long). Alternatively, you can use a clock or a timer to decide when to swap jobs. It is fine for a facilitator to take one of the roles and take turns accordingly (e.g. if one child is ill and not at school). It is important that the group decides when to swap roles.

You may wish to give children a role card describing their job. When you swap jobs, you swap cards as a reminder.

Describing Bricks

All members of the team need to be able to describe bricks when they are the Engineer, and children need to have a mutual language with which to describe bricks and understand other people's descriptions. You may wish to spend some time during the first sessions learning how to describe bricks. Bricks can be described according to their colour, shape and size. For example:

- Blue, 1 by 1 brick
- Red, 1 by 2 brick
- Yellow, 2 by 2 brick
- Black, corner brick
- See-through yellow nose cone
- White, round brick

There is no one definite way of describing bricks. Encourage children to describe the shapes and colours they see.

Freestyle Building

Once children are familiar with building models in teams rather than on their own and are able to sustain consistent turn-taking, you can start to introduce Freestyle Building. Freestyle Building is

designing and building your own creations using various LEGO® bricks rather than following printed instructions to build a particular model. This is done as a team.

Chapter 4: The Role of the Facilitator

Children will often go to adults first for advice. It is easy for the facilitator to quickly answer a child's question or find a solution to the problem. However, try not to do this. For most things it is more appropriate to ask the participants to get help from each other first. This might be by saying things like 'why don't you ask the other children?' or 'What do *you* think about this?' or 'let's ask Tom and Mary?'.

Deciding on Engineer, Supplier and Builder jobs

When assigning the jobs of Engineer, Supplier and Builder it would be easy to tell children which role they are going to play, but this is an opportunity to practice social skills. Usually, if the facilitator asks a group of 3 children, "Who wants to be the builder first?" all children volunteer as it is a popular job. Instead of assigning jobs, ask the children to generate their own fair strategies to decide who gets to be builder first ("Ok, if everyone wants to be the builder first, how do we decide fairly?"). Children will usually come up with some sensible strategies, for example, "rock, paper, scissors" or "Eenie meenie". If they cannot come up with their own idea, then you can prompt them to try an appropriate and fair strategy.

A missing piece

Sometimes, when children are building a model following set instructions, a piece might be missing. This stops children being able to carry on with the model building and can be very frustrating. Instead of the facilitator going off to look for the missing piece, other children or the entire group may be asked to provide help. The whole group can be paused to go on a "Search party," for a missing piece. If the piece can't be found, you can discuss using a different colour brick that's the same size as a substituted, and what feelings this brings up. If no substitute has been found, the children should be encouraged to think about what they want to do to continue the model or start a new one. Let them work this out between themselves.

Child building alone

If a child is building on their own without the help of other group members, instead of the facilitator asking them to join in, you should prompt the children to ask the child to return to the group, for example, by saying "Hey, I still need your help!". A certain amount of off-task behaviour should be tolerated by the facilitator, as concentrating on group building for more than 20 minutes at a time is a lot to ask of children, particularly younger group members.

Rule Breaks or Challenging Behaviour

In rare circumstances, a participant may continue to struggle with their behaviour. These challenges may happen during transitions or in peer conflict contexts. Where possible positive approaches are taken and peers are encouraged to help problem solve solutions and given the space and time to do so. Alternatives can be suggested and positive approaches praised. Often reminding participants of

the rules is enough. Where any negative behaviour carries on, the facilitator should ask the group members or a specific group member (for example an experienced group member) how we should address the situation. Time out, which involves leaving the LEGO® and sitting quietly elsewhere, are not used unless recommended by consensus from group members.

Spotting the good stuff!

As well as highlighting social problems and coaching children to solve those problems, the facilitator should also point out examples of good social interaction every time it occurs. If a child asks for a brick instead of snatching, praise them. If children are working together really well, say “well done!”, and so forth. It is important to focus more on the positives that you see going on in the group (for example, good building, good interaction, someone remembering another child’s name when they usually forget).

Chapter 5: Motivation and Rewards

Participants are usually highly motivated by the fact that they get to build LEGO®! However, there are several motivation and reward systems that are included in the LEGO® based therapy approach. These are LEGO® Club Rules, LEGO® Points and the LEGO® Club level system.

LEGO® Club Rules

The LEGO® Club Rules are rules for all group members to follow. They should always be displayed on a notice board in the room where the clubs are to be held. Having rules posted on the wall helps children to establish self-regulation and aids peer-mediated constructive feedback. We recommend that the group of children develop their own rules in discussion with support from the facilitator. The key task of the facilitator is to make sure the various areas are covered and that the rules are expressed with positive language. Examples of guidelines are as follows:-

1. Help to build things together
2. If something is broken, try to fix it, or ask for help to fix it
3. If someone else is using it, ask first
4. Use voices at a good volume (not too quiet, not too loud)
5. Be kind and polite to other people
6. Help each other and try not to use words that upset other people
7. LEGO® bricks stay out of mouths
8. At the end, help clean up and put things back where they came from

When a child or young person is introduced to a group, the others are asked to explain the rules, and a group discussion can take place. For example it is helpful to remind each other about the rules and discuss the rules.

It is important to be consistent with the rules and remain positive and friendly at all times. Whenever possible, the facilitator should request that the other children in the group remind each other about the rules. For example;

Facilitator: "Hey guys, is someone in here forgetting a rule?"

David: "Uh, yeah, Peter is hogging the big truck wheels."

Facilitator: "Anything else?"

Peter: "Yes! Sam is eating R2D2!"

Facilitator: "Why is that a problem?"

Peter: "It gets germs on it."

David: "And makes it sticky."

Facilitator: "What should we do?"

Sam: "I'll go and wash it"

Peter: "And dry it."

Facilitator: "Great idea."

LEGO® Points (optional)

LEGO® points can be developed as a way to reward group members for positive behaviours, social skills, collaboration and LEGO® building achievements. You might award a LEGO® point to a child for building with another child for 5 minutes or for positively following helpful rules. Points can be used to help reinforce children to work positively together. . You could create a reward chart for each child to collect LEGO® points, or collect LEGO® bricks in a jar. Points can be collected and traded in for LEGO® prizes if you think this will be motivating (such as small sets, LEGO® minifigures, time with a favourite model). After a while, points can become valuable enough on their own, and do not need to be linked to rewards. Instead, children seek the social approval of earning points.

LEGO® Club Levels

LEGO® Club levels reward children and motivate children to improve. Once skills are demonstrated for any level, children receive a LEGO® Club certificate (often kept and cherished by participants). The peers award the certificates rather than the facilitator.. This improves interest and motivation and a willingness to undertake challenging tasks. There are 5 levels: Helper; Builder; Creator; Master and Genius. Criteria for each level are outlined below, and certificate templates are given in the appendix.

Helper

Participants should be given the Helper level certificate, early on, when they first join a group . At this level, they are encouraged to help existing group members by sorting pieces when set building (e.g. all the grey pieces together), sorting freestyle pieces by colour, and/or checking all the pieces of a set are present and no pieces are missing. They might also help tidy up at the end of the session. If they work with others and help others in tasks, this can be mentioned and can be part of the explanation for why they have achieved this level.

Helper level serves different functions depending on children's skills. For those not proficient at set building, or who struggle to sustain attention on task, it allows participation, and gives opportunities for peer interactions and approval. For children with higher skills, it is a stepping stone to move on to higher skills, and this also includes peer approval and making friends.

Helper skills include the following:

- Pre-sorting pieces (e.g. into colours or shapes)
- Checking sets are complete against instructions
- Tidying up the room
- Cleaning LEGO® pieces if they are dusty or sticky

Builder

This level includes skills that involve:

- Building LEGO® sets of 100 pieces or more
- Showing that they can fulfil the roles of builder, supplier and engineer and especially work together in these roles.

LEGO® Creator

This is where a LEGO® builder can creatively design a freestyle creation with a friend. The skills include:

- Having an original idea for a freestyle creation
- A high level of skill in working together closely to build the creation
- Designing something that the other group members might like (e.g. in the group *'I know Bob likes planes, so I made an airport'*)
- Designing a model that is structurally sound and holds together (e.g. not a random design)
- Following a pre-determined plan/design from start to finish
- Creating a recognisable model (e.g. lorry, pirate ship, spaceship etc.)
- Clear evidence of thought, design and creativity
- Collaboration with peers to build the model

It is up to other group members to decide whether these criteria are met and a creator certificate has been awarded. Encourage discussions and complements and constructive, friendly feedback between the group.

Master

This is a level that involves:

- Leading a group project and especially showing kindness and showing an understanding of turn-taking and sharing
- Working together well
- Coordinated construction of a large LEGO® set (of at least 300 pieces)
- Planning a large freestyle project (e.g. an airport, a small town etc.)
- Assigning tasks and roles to other group members (project manager skills)
- Enlisting support and input from others (project manager skills)
- Engaging all group members
- Leading the group competently with demonstrable social skills

LEGO® Genius

This involves a higher level set of skills and involves writing a script or a story that can lend itself to LEGO® building. This might be an animated LEGO® film for example. It could also be a story with several LEGO® models attached to it. Or it may be a highly complex freestyle creation.

The LEGO® Genius must be able to:

- Write the movie script or story
- Communicate this story to the group
- Plan the LEGO® models associated with the story/script
- Lead the group in the project positively, working together
- Assign building tasks politely in a friendly way
- Assign roles for film making (e.g. action, voice, sound effects etc.)
- Direct the film making (e.g. camera control in an animated film or video camera in a video) in a positive way
- Direct the film (this project may take several sessions to complete) in a positive way

Chapter 6: Structure of a typical session

Group sessions usually last 60 minutes (but can be 45 minutes if time is tight or longer [90 minutes] if there is more time. It is useful to have a visual timetable for the session displayed for members of the group to follow. For a session of 60 minutes or longer, a general timetable for the session is as follows:

1. Welcome
2. Describe activities and agree the roles with the children leading
3. Semi-structured set building
4. Less structured play / Freestyle play
5. Clean up
6. Positive farewells

1. Welcome

The welcome involves greeting other members. As part of this participants learn each other's names and where possible encourages friendly eye contact. These structures also smooth the transition into the room where some young people may find this difficult. There may be other challenges such as with where for example members throw items of clothing down or may retain inappropriate clothing (e.g. a heavy coat indoors). They may wish to continue using a phone or personal music devices. This offers a good opportunity to address issues in the group and discuss them in ways that are constructive and facilitate helpful new skills and learning. Once the children come into the room, it is usually helpful to have a routine way of greeting the children and modelling them to greet each other. Some of them will be anxious and will not greet each other unprompted. However, most children will be happy to do it once they know the rules of engagement. It may be that eye contact is fleeting and this is fine.

2. Describing activities and agreeing roles

Here, the facilitator and children discuss what activities will be the focus for the session. This can be as simple as an announcement by the facilitator, e.g. "Hey guys, we have a new set to do this week, who wants to build it?" Or, it can involve a lengthy and potentially heated discussion about the group activity. Remember the facilitator's role is to facilitate children to negotiate and compromise with each other, not to dictate what happens.

If there are different options for activities or choices of models to build, now is the time to discuss what needs to be done in order to meet the activity goals for the day. This might involve dividing up the time among tasks, or agreeing to build one model this week and another next week. The facilitator has to help the group members to work out compromise solutions.

Allowing free play early in the session is often not helpful as it can be difficult for children to then move to more task-based play. Free play is certainly a good thing, but best left until after the project is finished.

3. Semi-structured building

The main task in a group is usually to build a model and once the children and young people get going this can often work very smoothly. Most sessions, especially early on, in LEGO® based therapy involve building a set together. Group members are actively engaged in building Lego sets, typically performing their roles of “Engineer”, “Supplier” and “Builder”. More advanced groups are likely to be more flexible with the roles and to engage in more freestyle group projects (such as building two spacecraft prior to playing out a space battle). It should last at least 20 minutes of the session, or longer, depending on the attention span of the group members, the complexity of the model being built, and the other tasks to complete in the session.

The facilitator may need to be active, or less so, depending on the developmental level and skills of the group. For newer, less familiar tasks, there may also need to be more support from the facilitator. This is not didactic rule giving but support and facilitation of discussion with the group to promote problem solving. Younger group members or inexperienced builders tend to require more support. The level of model is an important choice so the facilitator can focus more on the social and communication coaching, and not for example on helping getting the model built on time.

For the first few sessions it is best to build easy and quick models that can be finished in one session. It is disappointing for the group members if they can't complete a model in the time available. As the group gets more familiar with building as a team, and more proficient at set building you can start to incorporate more complex models that take more time to build. These models can be built over two or more sessions.

4. Less structured play/freestyle building

After set building, there is often time remaining. This can be used for allowing members to pursue their own interests and projects. In this way the structure can be dropped to promote transfer of skills into more relaxed settings. During this time, Freestyle Building can happen linking members who may be engaging in play activities with similar themes or interests or level of complexity. However, children may just need some time to relax and enjoy LEGO® building after the intense concentration of set building in pairs. The role of social communication coach is still important in this part of the session. Social problems or great social interaction can still occur and should be approached in the same way as in other parts of the session.

This is also the time where certificates of achievement and/or prizes can be given out, and the session can be reviewed. You may also wish to take photographs of the models you have made, or discuss where to display them.

5. Clean-up time

Building LEGO® models can be a messy business! Clean up time is important to save the facilitator having to crawl about on their knees for ages at the end of every session, and to give the children a sense of ownership of the materials and pride in keeping them ordered and in good condition.

Clean-up time should start 15 minutes before the end of the session. Cleaning up is not as fun as building, and children need to finish what they're doing prior to starting clean-up. Give at least 2 or 3

warnings about five to ten minutes ahead of clean-up time, depending on how involved the ongoing projects are, and the extent of mess in the room.

During clean-up, all materials have to be put back where they came from. All members should help each other put materials back, not just the ones they were personally using. This is a good team-building exercise. Remind them that any pieces left on the floor will go into the vacuum cleaner. Facilitators should watch for mistakes as children try to put LEGO® back anywhere rather than in the right place. Rewards can be offered for cleaning up on time (see Motivation and Rewards section).

6. Farewell

Once the room is put back in order and everything is off the floor, cue group members to give age appropriate farewells, including use of members' names. In this research the children are likely to be doing the therapy in the school day. If at the end of the day parents may be waiting to collect their children and this could be an opportunity to feedback about the group session while group members are saying farewell to each other. Use this time to encourage parents to carry on tasks at home. For example:

Facilitator: Sam did some great sharing today. He took turns building the model and worked well with the other children.

Mum: Wow, that sounds good. He usually takes toys off his brother.

Facilitator: Perhaps encourage him to play together for 5 minutes with his brother for a few nights a week and see if you can support him to play together

Mum: OK I'm willing to try anything.

Displaying and showing successfully built models

Many children will take pride in successfully building models or sets. They take pride in the final product, but also in the skills used and in creativity and working together. Different children will take pride in different aspects. Some children on the autism spectrum may not be very good at showing or sharing achievement, interests or pleasure, but the fact that they are working with other children who have similar interests makes this more likely to happen. Children are therefore encouraged to display their models for parents and siblings. This can be done using photographs, but is much better done in person perhaps at the end of particular sessions or at specially arranged events. They can also be shown in display cabinets or in a display in the room that is being used.

Chapter 7: Freestyle Building

Once children are well versed in set building and taking on the various roles, and once they have learned to interact and play in a supportive way, then it is possible to move onto freestyle building. Freestyle building involves the children designing and building creations that have no instructions. Only move on to this once the set for that week has been completed and if the children are ready to play without the structure given by set building (some children need this for longer than others).

The emphasis in freestyle building is on collaboration, so children design and build their creation in pairs (or small teams) rather than on their own. The facilitator can help steer the pair towards possible projects which have good potential for success.

Freestyle building involves an increased demand for communication, sharing of ideas, negotiation and compromise. To start with, children should work in pairs, with one child acting as the Engineer who designs the freestyle creation. The second child acts as parts supplier and builder. They will maintain these roles until the model is completed.

Once children become used to designing and building models in pairs, they can work using less structured roles, and simply be asked to design and build something together. The less structure, the more need for support from the facilitator.

During freestyle building the emphasis can be on effective communication and collaboration. This may include helping to develop more complex skills such as turn-taking, compromise and problem-solving. This can be encouraged or modelled where appropriate by the facilitator. Allowing the participant to take control of this may not work (for example the Builder may take over and ignore the others) and the facilitator may need to take a more active role, encouraging social problem solving ('Oh dear we have a problem, only one of you is working on the model, what should we do?') or modelling (e.g. the facilitator join in a role (Parts supplier or Assistant builder). Sometimes the facilitator may need to go back to what was discussed before ('earlier we said we would all help each other and work together'). Sometimes the facilitator may need to 'unbalance' the power dynamic in the room ('what do you two think of the fact that Jed is doing all the building on his own?' 'What can happen to make it more like we are working together?').

Freestyle projects tend to be more collaborative, with less order, and remaining seated is not always necessary or appropriate. Participants tend to roam around the project to get access to materials, and the facilitator will be challenged by the many opportunities for constructive feedback regarding nonverbal communication.

Advanced Social Communication

It is unlikely that advanced social communication will be reached in 12 sessions. However, we describe it here for completeness. Once children are familiar with each other and the activities in LEGO® based therapy, you can start to work on more advanced social communication skills. In well-established groups, or in clubs with older members, you can carry out more complex activities (such

as animated stop-action movies using LEGO®). You can also introduce more discussion about social and communication difficulties that members have outside of the LEGO® Club setting. One way to do this is to chat about difficulties while building LEGO®. Another way is to introduce a 15 minute “check in” time at the beginning of every session.

Check-in

During ‘check-in’ the members are restricted from LEGO® projects for the first 15 to 20 minutes and are instructed to present to the group any significant or emotional event that occurred in the past week since the last group session. If you think your children are ready after 5, 6 or 7 sessions you might try this.

Participants are encouraged to take turns and to listen to each other without interrupting. They give a brief description of the event for two to three minutes. When finished, other group members are encouraged to ask questions or respond. Positive interactions such as shows of empathy or support or praise are themselves praised. When problem-solving suggestions are proposed these are encouraged. Group members who are hostile or who make inappropriate, rude, unpleasant suggestions are usually ignored and encouraged to try more positive alternatives. Sometimes there is a need to gently correct or demonstrate fairness asserting the positive ethos of the group.

After check-in, the group discusses what they plan to do during what is left of the session (i.e. choosing a LEGO® project).

Chapter 8: Ending Therapy

In this research there are 12 sessions.

It is helpful to give warnings at each session about what session number you have reached and how many are left. Plan a certificate and a little ceremony or party in the final (12th) session.

It is helpful to talk with the children and young people about things that they may go on to do after the groups. This could be to join some other after school social activities with their friends.

In some schools or communities, LEGO® based therapy groups have been set up as after school clubs once LEGO® based therapy has finished, and some of these have a more open door policy. In some LEGO® based therapy clubs past 'graduates' have been given an open invitation to come back to be 'helpers'. We tend to avoid this as the dynamics of the new group will be unfolding, but we would certainly encourage the formation of new after school clubs involving either LEGO® or other enjoyed activities.

Chapter 9: Assessment and Evaluation

Assessment

In order to know that a child is ready to join a group it is useful to have some understanding of their skills, strengths and weaknesses. This can be done either in discussion with the teacher or during play with any child in question. It would be important that the child can master the following skills.

- Being able to sit in a chair at a table for 10 minutes
- Understand and respond to simple verbal and non-verbal communication
- Play with minimal aggression or destruction
- Have an ability to wait for short periods of time
- Use both expressive and receptive communication with peers, verbally or non-verbally

In terms of playing with LEGO® it is usually helpful that a child is of sufficient developmental age to be able to:

- Use simple language for LEGO® pieces to be able to describe them
- To have the skills to find described LEGO® pieces
- To be able to sort LEGO® by shape, colour, size or similar pieces
- To follow simple visual instructions
- To put pieces together constructively in line with the model being used

These skills can be explored during simple play, as part of an informal assessment.

Gathering information from others who know the child well

It is helpful to get to know the children you have in your group.

It will be helpful to gather some information from the parents/caregivers and teachers about the child.

This could include the following:

- Their temperament
- Their preferences
- Their preoccupations or interests
- Their social communication skills including:
 - Eye contact
 - Use of facial expressions in communication
 - Use of gesture in communication
 - Understanding of social cues
 - Understanding of the emotions of others
 - Ability to share
 - Ability to turn take

- Imaginative abilities
- Linguistic developmental abilities
- Any unusual language
- Any mannerisms or unusual movements
- Any sensory interests
- Any sensory fears

Simple instructions when playing with LEGO® help test these skills. This might include examples such as:

- Find another one like this (matching skills)
- ‘Find the yellow ones’ (sorting)
- ‘Look at this green one’ (in the picture) ‘find one like this’ (following instructions)
- ‘Put this one on top of that one’ (construction)
- ‘My turn’ ‘your turn’(turn taking)

Evaluation

It is essential that you evaluate the progress of the young people in LEGO® based therapy groups. Check that the child is enjoying the sessions. In this research we will be collecting information to help us understand whether the therapy is working.

There will be some questionnaires to fill in to show a child’s progress. These will be filled in by teachers and parents. The research team will be in contact with parents and teachers to ask them to complete some questionnaires.

After each therapy session we would like the facilitator to complete two forms:

- The fidelity checklist (please photocopy this questionnaire and send a copy to the research team each week).
- The session resource use questionnaire.

If you have any issues completing these forms please let the research team know as soon as possible.

In addition, the facilitator will be asked to complete one further questionnaire after the group has finished. This is the acceptability questionnaire, which will allow the research team to see the facilitator’s opinions on the therapy and whether they thought the therapy has helped the children.

The research team will also ask whether a small number of the group sessions can be filmed. This is so the team can see how the group is getting on. The facilitator will also be invited to take part in a short interview to talk about their experience of LEGO® based therapy. The filming and interview are optional.

Chapter 10: Preparation for Therapy

Preparing the children for the sessions

Before a child comes to the first session it is important to explain to the child exactly how the sessions are going to work. This establishes the rules, structures and goals of the group clearly in the mind of the child and helps them prepare. The research team will explain the group structure and the therapy to the parents when they meet them to complete the first set of assessment and evaluation forms. Although the research team have discussed the therapy with the parents, it is useful for the facilitator (or another member of staff at the school) to give parents information about:

- The dates and times of each LEGO® based therapy session
- The venue
- The waiting area and the main room
- The structure, routine and rules of the groups
- A brief summary of who else will be there
- A description of what they will be doing in terms of the three main roles and how these will be shared
- The levels and rewards/certificates

Information Leaflet

The research team will provide a written information leaflet about LEGO® based therapy. This has been approved by an ethics committee.

Some children may need some preparation first before joining a group. This can be done by starting with a 1:1 session to introduce them to LEGO® and model building.

Chapter 11: Frequently Asked Questions

Can siblings join in the groups?

In this research we are not asking siblings to join in at school. This is because they bring their own dynamics from home into the group, and there are already established patterns of interaction between a child and their sibling. They may for example be very caring or very competitive. If parents ask please decline this request politely but suggest that parents can of course set up similar collaborative play arrangements with siblings at home.

Can parents join in or observe?

Again, the group dynamics are often changed when a parent is in the room. Children will be used to behaving in certain ways with their parent, and these groups are about helping children establish healthy interactional plans with children their own age. We would suggest that it is politely declined as experience has shown that children behave or cope in very different ways.

Manual References

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- Spence SH (1998). A measure of anxiety symptoms among children. *Behav Res Ther* 36:545–566.
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Popular LEGO® Kits

Age range 4-7

Lightning McQueen	10730	47 pieces
Batman Vs Mr Freeze	10737	63 pieces
Stephanie's friendship cakes	41308	94 pieces
Anna and Elsa's Frozen Playground	10736	94 pieces

Ages 6-12

Mighty Dinosaurs	31058	174 pieces
Ocean Explorer	31045	213 pieces
Jungle Halftrack Mission	60159	378 pieces
Super Soarer	31042	100 pieces

Ages 10-16

Trash Chomper	70805	389 pieces
Desert Lightning	70622	201 pieces
Millennium Falcon	75105	1330 pieces
Street Motorcycle	42036	375 pieces



Brick Club Points

<u>Name</u>					
<u>Name</u>					
<u>Name</u>					

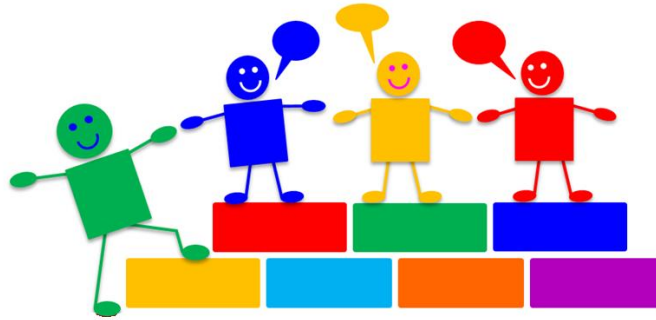




Brick Club Rules

1. Help to build things together
2. If something is broken, try to fix it, or ask for help to fix it
3. If someone else is using it, ask first
4. Use voices at a good volume (not too quiet, not too loud)
5. Be kind and polite to other people
6. Help each other and try not to use words that upset other people
7. LEGO® bricks stay out of mouths
8. At the end, help clean up and put things back where they came from





Brick Club Homework

Name:

Date:

In Brick Club today, I practised: _____

I got Brick Club Points for: _____

My Homework is: _____





Freestyle building ideas

It is important for the children in your groups to come up with their own ideas for freestyle building projects as this gives a sense of ownership of the club. It could be that a more experienced child has an idea for a project and can act as project “director” with one or two other children supplying parts for the build. Alternatively, two children could come up with an idea together and build it collaboratively in a less structured way. The main aim is for children to practice working together- this will not always go smoothly and requires adult support! If children are unable to come up with their own ideas for freestyle building, you can give them some suggestions. Here are a few ideas:

- Space rocket, space ship, space buggy
- Multi-terrain vehicle
- Swimming pool (then you can take it outside to see if it holds water!)
- Boat (will it float?)
- Robot
- Car/lorry/plane
- Castle
- Zoo
- With large LEGO® bricks, build a chair and see if it can take your weight
- A city- each week add a new element (houses, road, police station, fire station, helipad, hospital etc.)- this requires being able to store the city each week! You can then move on to making stories collaboratively about what happens in the city, maybe making a video

There is a huge amount of info on the internet for ideas for using LEGO® for various activities. Have a look around, but here are a few examples:

<https://education.lego.com/en-gb/lesi/elementary/buildtoexpress>

<http://homeschoolencouragement.com/teach-stem-lego-bricks-activities-free-printables-games/>

<http://kidsactivitiesblog.com/64291/75-fun-lego-ideas>































<https://uk.pinterest.com/debchitwood/kids-lego-learning-activities/>

<https://uk.pinterest.com/marymakesmusic/lego-activities/>

<http://www.legoengineering.com/wedo-activities-and-building-projects/>



Name Your Bricks!

 Red 1 by 1	 Green 1 by 2	 Grey 1 by 3	 Yellow 2 by 2	 White 2 by 3	 Brown 2 by 4
 Red corner plate	 Yellow seat	 Yellow flat tile 1 by 1	 Blue flat tile 1 by 2	 Plate 1 by 1	 Plate 1 by 2 with 1 knob
 White hanger	 Plate 2 by 2	 Plate 4 by 4	 Blue radiator grill 1 by 2	 Round plate 1 by 1	 Bearing 2 by 2 (wheel connector)
 Black stick holder	 White frame	 Connecting bush	 Black clamp	 White angle plate	 Tyre
 Windscreen	 Grey hinge (upper and lower parts)	 Cross axle with groove	 Green hinge plate	 Red tap	 Yellow flower

LEGO® Based Therapy Session Plan

Group Members:

Facilitator(s):

Location:

Session Number:

Activities for this session (*e.g. introduce rules, brick descriptions, build a particular model, give certificates etc*)

Targets for this session (*e.g. children to work together, practise turn taking, any behaviours you want to work on*)

Brick Club Session Evaluation



Session number:

Facilitator(s):

Group members present:

What did you do this session?

What went well?

What was challenging?

What is the plan for next week, and is there anything to prepare?

Any other comments about the session?

Reflection of facilitator skills:

After each session it can be helpful to reflect on your own skills as a facilitator. You can do this by discussing things with a colleague. You may wish to use the following questions to help you:

Give yourself a score out of 5 to rate the extent to which you achieved the following (0 = not present, 5 = consistently did this):

1. Noticed and praised positive social interaction

Comments:

Self-rated score /5:

2. Allowed/prompted children to identify problems and come up with their own solutions?

Comments:

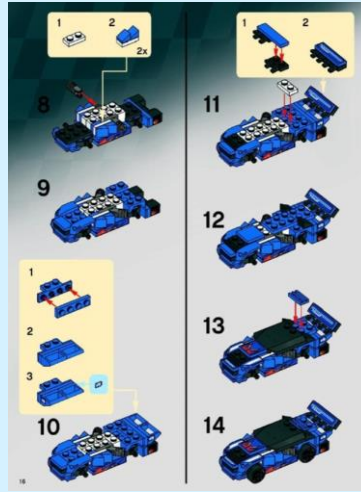
Self-rated score /5:

3. Prompted children to practice a strategy they have come up with before?

Comments:

Self-rated score /5:

Engineer



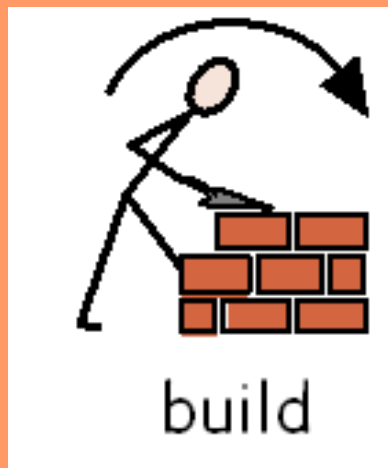
- ✓ Look at the instructions to see what pieces are needed.
- ✓ Ask the supplier to find the pieces.
- ✓ Tell the builder where the pieces go, using the pictures to help.

Supplier



- ✓ Listen to the Engineer.
- ✓ Find the pieces the Engineer asks for.
- ✓ Give the pieces to the Builder.

Builder



- ✓ Wait for the supplier to give me the pieces.
- ✓ Listen to the Engineer who will tell me where to put the pieces.
- ✓ Look at the instructions for help.
- ✓ Build the model.