ice breakers

ideas

implementation

evaluation

lessons learnt

innovation tools

encouraging innovative design

Innovation Toolbox

What can it do for me ?

To help creativity and decision making throughout design and construction, a set of tools has been developed to promote innovative behaviours that will lead to more sustainable solutions. The tools are simple to use and suitable for different issues and industries. They are based around four key areas of innovation – ideas generation, evaluation, implementation and learning from experience

What else do I need ?

This box contains a number of tool cards that are perfect for the busy project team looking to improve sustainability through innovation on their projects

- You can flick through the cards using the easy reference system on the edge of the card

- Each card includes a quick reference section listing the name, purpose, duration, difficulty and number of people involved

- Some of the tools can be used together. Suggestions for these combinations are listed on the tools

- Where additional material / resources are required this is indicated on the front of the tool card
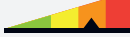
Meeting Facilitation Tips

- Read and understand the tools before attempting to use them in a meeting

- Have all of the resources ready that are mentioned on the cards

- Ensure that everyone has an equal say and that no one dominates and takes over the meeting

- No ideas should be dismissed before being properly evaluated

- Try to think of ways to include these tools within your existing meetings, so as not to create yet another meeting

- Consider using a trained meeting facilitator to ensure the smooth running of the meeting

- Never say things like "we don't do things like that here"

- Make sure people in the meeting are aware that this is about doing things differently, breaking from the norm. These tools are to increase the amount of sustainable innovation in a project

ice breakers   ideas   implementation   evaluation   lessons learnt
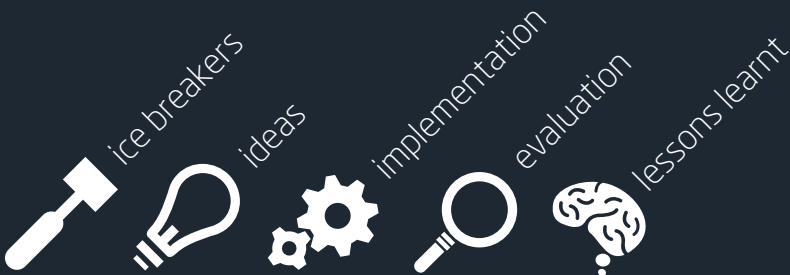
Affinity Brainstorming

Purpose: Ideas generation

Duration:

Difficulty:

No. of People:
team

Q What can it do for me?

A Affinity brainstorming is a brainstorming technique which is particularly well suited when there is an overly shy or outgoing group or a mix of the two.

It gives the participants a degree of anonymity and stops the more outspoken members of the group from taking over the session.

Q What else do I need?

A

Post-it Notes

Suitable wall or surface to stick Post-it notes to

Space for people to move around whilst placing / moving Post-it notes into groups

Q Where do we go for help

A

www.saltlane.co.uk/Resources/affinity%20brainstorming

The Rules of Brainstorming tool card should be used to support this tool

What have I got to do ?

Affinity Brainstorming is very similar to normal brainstorming, the difference being that all comments / ideas are written down on post-it notes individually and in silence.

This is a good technique for exploring ideas but not the best way for making decisions.

Pose a problem to the group and follow these step to come up with ideas.

Step 1: Each member of the team writes down their comments / ideas of post-it notes in silence

Step 2: The post-it note from the group are then stuck on the wall

Step 3: There is a quick discussion about the post-it notes to make sure everyone understands what the comments mean

Step 4: The team rearranges the post-it notes (potentially in silence) into groups of similar or related ideas (Affinity groups)

Step 5: The team discusses the groups to develop the ideas

A further round of individual brainstorming can happen if discussion from the first round has stimulated further ideas in the group.

The Rules of Brainstorming

Purpose: | Improve brainstorming

Duration:

Difficulty:

No. of People:

team

Q What can it do for me?

A

Makes your brainstorming sessions more productive and better focused.

These rules can be used to support a number of other tools in this box.

Q What else do I need?

A

Pens, post-it notes / paper

Q Where do we go for help

A

www.brainstorming.co.uk/tutorials/brainstormingrules

What have I got to do ?

Follow the rules below to improve your brainstorming sessions:

Rule 1: Don't judge the ideas too early

Rule 2: Any ideas go, don't hold back

Rule 3: More ideas the better

Rule 4: Use other's ideas to generate further ones

Rule 5: All ideas are valid

Rule 6: Everyone has an equal say

Prototyping

Purpose: Developing an idea

Duration:

Difficulty:

No. of People: team

Q What can it do for me?

A Constructing a physical model of a concept, solution or idea can help to firm up the idea, develop a solution, generate options and communicate the solution to others.

Q What else do I need?

A Requires physical materials for constructing a model. This could be construction systems (Meccano or Lego for example) or simple card board, sticky tape, glue, etc.

Q Where do we go for help

A

What have I got to do ?

Before the prototyping session happens you and your team will need to prepare by gathering together materials to use. These could be things like Meccano or Lego, or could be waste household goods like egg boxes, toilet rolls, washing up bottles etc.

Make sure there is plenty of sticky tape, string, scissors etc available to help on the day. You will need quite a bit of space for this task.
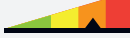
Working as a team construct a physical model of your idea, design or concept. This approach is surprisingly helpful to develop your ideas and identify problems that you might not have thought of.

Example: Here is an example of a prototyping session

The Delphi Flower

Purpose: Remote decision making

Duration:

Difficulty:

No. of People: team

❓ What can it do for me?

A Decisions can be made outside of the meeting room, either ready for the next meeting or to tie up loose ends from an over run meeting.

This method is based on the premise that decisions are reached more quickly and more consensually if participants see the preferences of others and can change their own preference without loss of face.

❓ What else do I need?

A The facilitator needs to allocate some time towards preparing each stage of the Delphi Flower process for dissemination to the group.

❓ Where do we go for help

A

What have I got to do ?

Step 1: Define the problem / decision needed.

Step 2: Set a time frame for the exercise and the number of iterative stages required.

Step 3: Brainstorm ideas (This could be in a meeting or via email)

Step 4: Collate the ideas pictorially arranging them as petals around a central hub with the question / problem stated in the centre.

Step 5: Send the results to the group, asking them to vote for their preferred idea and add any additional ideas to the diagram. All responses should be anonymous.

Step 6: Collate the results of the vote and additional ideas to create another flower. The size of the petals shows how popular each idea was.

Step 7: Email the results out to the group again for a second vote.

Step 8: Repeat steps 5 - 7 as many times as required until a decision is made

Excel radar charts could be used to represent the scores in steps 4 - 6
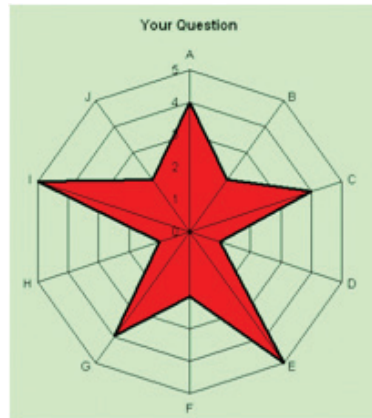
People Centred Research – Extreme Users

Purpose: Gaining new insights

Duration:

Difficulty:

No. of People:

Individual or team

Q What can it do for me?

A Helps you take others views, insights and expertise into account when developing your ideas.

Typically we design for core or typical users. Identifying and interviewing individuals who are extremely familiar or completely unfamiliar with a product, service or behaviour will often highlight key issues and provide valuable insight for improvement.

Q What else do I need?

A Nothing

Q Where do we go for help

A Please see the other two People Centred Research tool cards on Analogous Situations and Questioning Techniques for additional help.

What have I got to do ?

Step 1: Review your current situation / problem

Step 2: Brainstorm users of your situation / problem

Step 3: Identify who are the extreme users. Think about someone who:

- Is completely unfamiliar with this situation

- Wouldn't care about this situation at all

- Would intentionally avoid this situation

- Is extremely familiar with this situation

- Has highly refined and particular needs related to this situation

- Demonstrates radical behaviours related to this situation

Step 4: Observe extreme users to see how they work making notes of any key observations. The People Centred Research – Questioning Techniques tool card gives advice

Step 5: Review any challenges, issues or adaptations that they have to improve your solution

Example:

When considering design of a new car seat users would be car drivers and passengers. An example of an extreme user might be a taxi driver. Through talking to a taxi driver you might gain insights about improving comfort and durability through modification they may have made.

People Centred Research – Analogous Situations

Purpose: **Gaining new insights**

Duration:
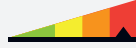
Difficulty:

No. of People:

👤/👤👤👤 Individual or team

Q What can it do for me?

A This tool helps you to see and understand how others have solved problems that you may be having.

Q What else do I need?

A Nothing

Q Where do we go for help

A Please see the other two People Centred Research tool cards on Extreme Users and Questioning Techniques for additional help

What have I got to do ?

Step 1: Review your current situation / problem

Step 2: List the key characteristics of your current situation / problem

Step 3: For each of these characteristics brainstorm analogous situations where the same characteristics apply. This tool works best when they are in different industries / fields

Step 4: Observe the people within the analogous situation to see how they work, make notes of key observations

Step 5: Review the differences to improve the way you work

Example:

When an operating theatre team was receiving poor feedback from patients they tried to find an analogous situation to find ways to improve. They recognised the team was working closely together, under extreme pressure, focusing all of their attention on one person. The analogy they found was with a Formula 1 pit stop. After going out to speak with a pit stop team they identified that one person's (the lollypop man) sole task was to communicate with the driver whilst in the pit stop to give them confidence of what was going on around them. Taking this back to the operating theatre the team then dedicated someone who was responsible for comforting the patient before being put to sleep. This improved their patient feedback scores.

People Centred Research – Questioning Techniques
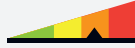
Purpose: Gaining new insights

Duration:

Difficulty:

No. of People:

Individual or pair

Q What can it do for me ?

A People Centred Research – Questioning Techniques provides guidance on ways to observe and talk to others that help you identify true behaviour rather than what people want you think about how they behave. Very useful when using the Extreme Users and Analogous Situations tools to help you improve your understanding and awareness of the existing situation.

Q What else do I need ?

A Someone to help you take notes of the conversations and observations. This enables a more free flowing informal discussion.

Q Where do we go for help

A Please see the other two People Centred Research tool cards on Extreme Users and Analogous Situations for additional help.

What have I got to do ?

Rules for observations:

- Should be as informal and in context as possible i.e. in the location where the activity of interest takes place.

- Should not follow a rigorous set of questions – instead have a discussion guide for areas you want to cover

- If the interviewee mentions something of interest ask them to show you this and elaborate on it

- Conducted with at least 2 people – one to lead the discussion, the other to take photos and notes

- You should frame the interview as a generic chat about 'life in the office', for example, rather than 'low-carbon behaviour' – otherwise you risk alienating people and catching them on their best behaviour

During your discussion things you are looking out for include:

- How people interact with each other

- Day to day realities

- How people adapt

- When people get it wrong

- When people struggle

- When people get it right

- What people keep under wraps

- What's important to people and what's not

5 Capitals Model

Purpose:	Decision making

Duration:

Difficulty:

No. of People:

Individual
or team

Q What can it do for me?

A

This tool will help you to make more sustainable decisions.

There are five type of sustainable capital from where we derive the good and services we need to improve the quality of our lives.

Q What else do I need?

A

Nothing, but you could use this tool with the Concept Screening Tool to provide the required criteria

Q Where do we go for help

A

More information on the 5 Capitals Model is available from Forum for the Future

www.forumforthefuture.org/project/five-capitals/overview

www.forumforthefuture.org/sites/default/files/project/downloads/five-capitals-model.pdf

What have I got to do ?

Assess the proposed design solution(s) or product(s) to see if it is likely to increase the stocks of the 5 capitals. This is likely to be an approximate quantitative assessment or a qualitative assessment. The important point is to broaden the evaluation beyond simple cost terms.

The 'best' option will be the one which creates the most capital in all five areas.

The five types of capital are:

Natural Capital – natural resources and processes needed to produce products or services.

Human Capital – incorporates health, knowledge, skills, intellectual outputs, motivation and capacity for relationships of the individual.

Social Capital – value added to activities by human relationships, partnerships and co-operation.
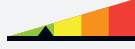
Manufactured Capital – materials, goods and infrastructure owned, leased or controlled by an organisation contributing to but not directly incorporated in the outputs.

Financial Capital – assets that exist in a form of currency that can be owned or traded.

Concept Screening Tool

Purpose: Decision making

Duration:

Difficulty:

No. of People:

Individual
or team
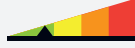
Q What can it do for me?

A

A simple tool for comparing options to decide which is the best solution to take forward for implementation. Can be used to assess the sustainability of solutions

Q What else do I need?

A

Enough information about the options to score them effectively

Q Where do we go for help

A

The Five Capital Model tool could be used here for the criteria to score the options against

What have I got to do ?

Weighing it up

A series of criteria is defined and a baseline option is selected. Other options are then scored by comparison with this baseline option. The scores can then be compared.

Step 1: Identify criteria (could be Five Capital Model)

Step 2: Select baseline option (This is given a score of zero in each criteria)

Step 3: For each option in turn work through the criteria award a score with how it compares against the baseline option. Scoring can be positive or negative on a scale of -10 to +10.

Step 4: Add up the scores for each option

Step 5: Compare the score and use them to identify criteria or features which can be improved, or if the position is clear, to select your preferred option

Here is an example of a table that could be used to score your options:

Criteria	Baseline Option	Option 1	Option 2	etc
Criteria 1	0			
Criteria 2	0			
etc	0			
Total	0			

SCAMPER Technique

Purpose: **Ideas Stimulation**

Duration:

Difficulty:

No. of People:

Individual or team

Q What can it do for me?

A A useful tool to use when you are running out of ideas. Can help to encourage new ways of thinking about a problem by asking 7 simple questions.

Q What else do I need?

A Card handouts are available in the box to help the group remember the questions or if you are viewing this tool electronically then a pdf can be found here:

Q Where do we go for help

A www.creatingminds.org/tools/scamper

SCAMPER was defined by Robert Eberle

The Rules of Brainstorming tool could be useful to support this tool

What have I got to do ?

SCAMPER is an acronym of questions that can be asked to prompt new ways of thinking about a problem. This will help the group come up with new ideas.

Either individually or as a group ask the questions one at a time to help you encourage new ways of thinking.

Substitute - What can you substitute?

Combine - What can you combine or bring together somehow?

Adapt - What can you adapt for use as a solution?

Modify - Can you change the item in some way?

Put to other uses - How can you put the thing to different or other uses?

Eliminate - What can you eliminate?

Rearrange - What can be rearranged in some way?

Generic Parts Technique

Purpose: **Ideas Generation**

Duration:

Difficulty:

No. of People:

team

Q What can it do for me?

A

The Generic Parts Technique helps you to break down an object, piece of equipment, process or procedure into its component parts. This can be used to reveal alternative ways of achieving a desired function that were previously not obvious. This should lead to more innovative and sustainable solutions.

Q What else do I need?

A

Requires no additional materials but in some cases physical samples maybe helpful to prompt discussion.

Q Where do we go for help

A

Software is currently under development to support this technique by Tony McCafferey who devised the technique for more information visit: http://edesign.ecs.umass.edu/

What have I got to do ?

To apply this technique you need to create a list breaking down your problem into its component parts

To develop this list repeatedly ask the following two questions of each part:

Q1: Can it be broken down further?

Q2: Does my description of the part imply a particular use? If so create a more generic description.

This process can be recorded through a tree diagram breaking down each component to its generic components. Each of these can then be examined for alternative uses or opportunities

Example:

You are asked to join two metal rings together using only a candle and matches.

First attempts involve melting the wax to join the two rings together however these easily pull apart.

Using the Generic Parts Technique the candle can be broken down into wax and a wick. The word wick implies a use but It is really just a piece of string which could be used to tie the rings together.

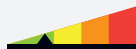# Head, Heart & Hands

Purpose: Idea Evaluation

Duration:

Difficulty:

No. of People:

Individual
or team

Q What can it do for me?

A   Head, Heart and Hands forces a group to adopt three mindsets to get a balanced evaluation of an idea/problem.

Useful for when team members can not see the bigger picture

Q What else do I need?

A

No resources are needed for this tool

However Post-It notes and a white board maybe useful. Could be used with the Affinity Brainstorming tool

Q Where do we go for help

A

http://creatingminds.org/tools/head_heart_hands.htm

What have I got to do ?

Once you have got an idea help to 'sell it' using the Head, Heart & Hands technique. By thinking about the ideas using the three mindsets you get a wider range of views.

Get each member of the team to spend about 5 - 10 minutes reviewing the idea using the mindsets below. You should think about the pros and cons of your idea to sell its strengths and improve its weaknesses.

Head – Using only logical arguments

Heart – Using only emotional arguments

Hands – Using only practical arguments

Get the team to discuss the arguments from each of the mindsets.

Unless you can come up with a strong argument for all three mindsets, the question should be asked, is it a suitable solution?

Example: Choosing a new car

Head: Is it the right price, fuel economy

Heart: Does it look good

Hands: Has it got enough seats and boot space

Back to the Floor

Purpose: Ideas generation

Duration:

Difficulty:

No. of People:

Individual or team

Q What can it do for me?

A A way for generating new ideas by identifying frustrations, challenges, local workarounds and ideas which the operatives have developed during their work.

This should lead to innovative solutions which are safer and more sustainable.

Q What else do I need?

A Requires support from operational teams to allow team members to shadow or film an example of typical maintenance activity.

Q Where do we go for help

A Contact local area operations team.

Getting back to the floor

What have I got to do ?

Operatives can often have ideas for innovative techniques or approaches to tasks which may not be obvious to teams developing new projects. To address some of the common frustrations it is necessary to get teams to consider projects from an 'operatives eye view'.

Get some of the team to shadow an operative undertaking routine activities. This will provide hands on knowledge of the challenges and frustrations faced by operatives during these tasks.

The key to this tool is developing trust between the observer and the observed so that the operator reveals how they really work as opposed to how they think they are supposed to work.

As an alternative a series of video diaries could be developed into an online library. An appropriate video can then be viewed to give some understanding of the activities undertaken and challenges faced.

Following shadowing/viewing of the video a team discussion should take place discussing what could be done to improve future projects. Key considerations should include how to make operation safer, more efficient, less frequent and thus increase. sustainability

Listening Hats

Purpose: Idea Analysis

Duration:

Difficulty:

No. of People:

team

Q What can it do for me?

A Enables the project group to better analyse an idea or solution by listening with different 'hats'.

Often people only listen to an idea / solution from their own perspective / area of interest. This may lead to other view points being ignored.

This will give a more balanced analysis of the idea / solution.

Q What else do I need?

A No resources are needed for this tool

Q Where do we go for help

A

What have I got to do ?

Team members are assigned 'hats' with different view points to listen with.

Hats should ideally not be allocated to team members who have a particular interest in the hat as their views may already be known. It would be more interesting and valuable to gain their insights from a different hat then they would normally have.

The idea / solution is explained to the group, no criticisms or comments should be made, only questions for clarification

Once the idea / solution is explained, ask each 'Hat' feeds back what they heard from their point of view.

Collate the responses which should give a balanced view to take forward into a decision making process.
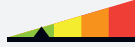
Suggested 'hats'

Sustainability

Financial

Technical

Operational

Maintenance

Safety

Public – Opposed

Pubic – In support

Local Council

Planning Authority

Stakeholders

Character Cards

Purpose: Idea Evaluation

Duration:

Difficulty:

No. of People:

team

Q What can it do for me?

A The 'Character Cards' tool helps project team members to argue from the other side of the table.

A debate is held where everyone is forced to adopt another persona, as defined by a randomly assigned character card.

This creates more empathy within the team and leads to a good team ethos.

Having adopted a different character within a debate, it is hoped that project team members will start to appreciate the views of others

Q What else do I need?

A Character Card pack included within the tool box

Q Where do we go for help

A

What have I got to do ?

Randomly assign the character cards to project team members around the table. Only character cards relevant to the meeting should be used

Give everyone two minutes to read the information on their cards and start to think about their newly adopted characters within the debate. The cards will give each person generic but thought provoking prompts from which you will be able to adopt an argument that you might not previously have voiced

It is important that everyone engages with their new characters within the debate

The idea, problem or solution is explained to your project team that is to be discussed

The project team now discuss / debate the idea, problem or solution from the viewpoints of the characters they have been assigned

When everyone has been allowed to present their opinions, the group will analyse whether any new information or ideas have surfaced as a result of the role play.

Another round with different characters can follow the first if it is thought to be beneficial

The Client

- Value for money
- Embodies the project's ultimate goals
- Good public image
- Long term solutions, not short term patches

The Designer

- Correct balance of simplicity and complexity

- Sufficient risk mitigation built into the design

- The design demonstrates innovation, building upon existing ideas and lessons learnt

- There is an opportunity to be sustainable, both with consumables and project outputs

Character Cards

The Contractor

- The design is simple to construct wherever possible

- Innovative ideas have less time to be implemented as the project advances; development of ideas with the designer preconstruction is priceless

- The majority of the construction risk has been mitigated pre-construction

- It is essential to reduce, reuse, recycle, recover

Character Cards

The General Public

- The project should not unnecessarily affect me during construction
- The project's outputs should benefit me
- The local environment should not be negatively affected
- It is good to be kept informed

Character Cards

SCAMPER Prompt Card

S Substitute
What can you substitute?

C Combine
What can you combine or bring together somehow?

A Adapt
What can you adapt for use as a solution?

M Modify
Can you change the item in some way?

P Put to other uses
How can you put the thing to different or other uses?

E Eliminate
What can you eliminate?

R Rearrange
What can be rearranged in some way?

Icebreakers

A collection of useful Icebreakers
to help you kick off a meeting

Three Questions Game

Everyone in the group writes down 3 provoking questions they would like to ask others in the group. Not the normal "what's you name" type questions but something like, "Where is the most interesting place you have ever travelled" or "Name a topic you feel absolutely passionate about".

Give them time to mingle, and to ask three different people in the group one of their three questions. Get back together and have each person stand and give their name. As they say their name, ask the group to tell what they know about this person.

Toilet Paper Game

Pass around a roll of toilet paper to the group and ask them to take what they need. No further explanation

When done. Tell the group that as they go around the room, each person must tell a fact or something about themselves for each square of toilet paper they took.

Birthday Game

Have the group stand and line up in a straight line.

After they are in line, tell them to re-arrange the line so that they are in line by their birthday. January 1 on one end and December 31 at the other end.

The catch is that they must do all this without talking or writing anything down.

Map Game

Hang a large map of the world. Give everyone a pushpin. As they enter, they pin the location of their birth on the map.

The Artist Game

Give everyone a piece of paper and a pencil. In 5 minutes they must draw a picture that conveys who they are with out writing any words or numbers. At the end of 5 minutes the host collects the pictures. Show the pictures to the group one at a time and have them try to guess who drew it. After this allow each of the artists to introduce themselves and explain how their work clearly conveys who they are.

Three in Common Game

Break the group into 3's. Their objective is for each group to find 3 things they have in common. But not normal things like age, sex or hair colour. It must be three uncommon things. After letting the groups converse for 10 - 15 minutes, they (as a group) must tell the rest of the groups the 3 things they have in common.

Dream Vacation Game

Ask participants to introduce themselves and describe details of the ideal, perfect dream vacation.

Favourite T-Shirt Game

Ask attendees to bring (not wear) their favourite T-shirt to the meeting. Once all participants have arrived, ask each person to show the shirt to the group and explain how the T-shirt best resembles their personality.

Icebreakers - Continued

Ball Toss Game

This is a semi-review and wake-up exercise when covering material that requires heavy concentration. Have everyone stand up and form a resemblance of a circle. It does not have to be perfect, but they should all be facing in, looking at each other. Toss a juggling ball or bean bag to a person and have them say what they thought was the most important / interesting fact was. They then toss the ball to someone and that person explains what they though was the most important / interesting fact was. Continue the exercise until everyone has caught the ball at least once.

Lucky Penny Game

Each person takes a penny or other coin out of their pocket and looks at the date. When it's their turn, they tell the year that's on their coin and recall something spectacular that happened that year.

Straw & Paperclip Game

Give each group a box of straws not flexible straws) and a box of paperclips. Check that the paperclips can fit snugly into the end of the straws. Give each group a task (you can use the same one for each group if you want) and let them go. Sample tasks: Build the structure as a group – tallest, strongest, longest, most creative, most functional, etc. Debriefing included describing teamwork and situational leadership skills used as well as how different models are needed to accomplish different tasks.

Four Facts Game

Each person writes down four facts about themselves, one of which is a lie. Each person takes turns reading their list aloud and the rest of the team writes down the one they think is the lie. When all are done reading the lists aloud, the first person reads their list again and identifies the lie. The team sees how well they did.

Human Knot Game

Divide into groups of 6-10 people. Each group forms a tight circle, standing and facing each other.

Everyone extends their hands into the circle and by intermingling their arms, grasps hands with other members of the group. Instruct people to "be sure that the two hands you are holding does not belong to the same person". The groups' goal: untie the knot which results. Member of the group physically climb over/ under/ through each other's arms to untie the knot of bodies. Note: It's RARE but it is possible for a knot to be unsolvable or end in two separate circles.

Quick Change Artist Game

Pair off into partners facing each other. Each player is to observe his or her partner's appearance. Then the players turn around back-to-back and make two or more changes in their dress, hair accessories, etc. When they face each other again, each partner must identify the changes made by his or her partner. This game can be repeated several times by changing partners and increasing the number of changes made.