

# **NonZeroSum**

## **A Collaboration Session for Researchers**

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Vitae Innovate 2010  
programme**

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## Acknowledgements

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In early 2011 the resources were tested by participants from the following institutions:

- Liverpool John Moores University
- The University of Manchester
- The University of Bristol
- Bangor University

Thanks to all of the participants for their help, and trainers at those institutions for their very helpful feedback: Jason Boulter, John Trantom, Jim Boran, Sarah Ashworth, Rachel Cowen, Sam Cathro, Anne Goodman, Penny Dowdeney and Gwawr Ifan.

Special thanks to Emma Gillaspay, Tennie Videler and Heather Pateman for supporting this project and for advertising the pilot sessions, and to Jen Allanson for very helpful conversations.

A big thank you to Kay, my wife, for listening to me patiently as I've talked about every aspect of this project, from inception through to completion!

Whoever you are, I hope that you find these resources, interesting, useful, easy to use and easy to adapt – and encourage you to use and adapt them!

Nathan Ryder, April 2011

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Take **eight to twelve researchers** and divide them into **two teams**; add **collaborative tasks** whose difficulty is multiplied by a series of **time-pressured rounds**; subtract difficulties by encouraging them to **reflect on their progress**; add **discussions on collaboration**; the result?

# NonZeroSum

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## Introduction

Collaboration skills are an increasingly desirable skill set for researchers to possess. There are many exercises designed to engage people in teamwork – but teamwork by itself is not enough. The main difference between collaboration and teamwork is that collaboration implicitly involves a group of people working together in different roles to produce something new, whether it be a paper, a process, a product or something else.

**NonZeroSum** seeks to engage with this by providing a series of short collaborative tasks for two teams to work on. All tasks require collaboration of some kind to successfully complete them. The tasks are pitched such that they require increasing levels of collaboration between the two teams.

In mathematical game theory terms, a zero-sum game is one in which (for example) two players compete in some way, with the winner gaining exactly what the loser loses. So if someone wins £5 and the other person loses £5 as a result, then the sum is 0. A non-zero-sum game is one in which winning and losing is more complicated: it may be possible for all parties to benefit regardless of the outcome, it may be that all parties could lose something due to the outcome. If you total the “winnings” and “losses” in a non-zero-sum game the total will not be 0. This suggests a link with the possibilities and outcomes of collaboration, hence NonZeroSum.

NonZeroSum was created by Nathan Ryder<sup>1</sup> as a Vitae Innovate 2010 project. The main aim of the session is to give people experiences that the facilitator can then debrief and help participants unpick what has happened. The format is flexible enough that it can be adapted quite easily, and the debrief time could be used as the opening for a larger session (if NonZeroSum is used as an icebreaker or long energiser); it could also simply be used to get participants thinking about what their experiences mean in a larger context, provide time and a format for action planning, or outline future collaboration and development opportunities for participants.

In terms of the Researcher Development Framework, the resource (in this release form) addresses the following points for participants:

- **A2 Cognitive abilities**
  - Critical thinking
  - Problem solving
- **A3 Creativity**
  - Inquiring mind
  - Innovation
- **B1 Personal qualities**
  - Enthusiasm
- **B2 Self management**
  - Time management
- **B3 Professional and career development**
  - Networking
- **D1 Working with others**
  - Collegiality
  - Teamworking
  - Collaboration

NonZeroSum is designed to be low-cost to run. Aside from common stationery items that most facilitators have access to, the only purchase needed is a single pack of playing cards. A complete list of items needed for the session is recorded after the breakdown of the session's timings.

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1 Nathan's website is [www.nathanryder.co.uk](http://www.nathanryder.co.uk), or email on [nathan@nathanryder.co.uk](mailto:nathan@nathanryder.co.uk)

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This resource was piloted with four UK HEIs in early 2011, and developed according to feedback from those sessions. Further suggestions for adaptation under the Creative Commons License, suggested by feedback from pilot participants, can be found at the end of this document.

## Outline

The training exercise consists of three rounds of tasks. The exercise as presented is for two teams of between four and six people (a cohort of eight to twelve in total). Each round has three tasks, and teams work at completing the tasks (as fully as possible). Tasks are worth a certain amount of points. Each round lasts 15 minutes, with a short changeover time between each round where teams are encouraged to discuss and reflect on what has just happened, and how they might approach the next round.

Some tasks are completely solo: the team has all of the resources that they need to achieve them, they just need to collaborate effectively. Some tasks can be made simple by sharing resources/information that do not cost a team anything to share.

Some tasks can only be fully completed by sharing resources/information that cost the team something to share, e.g., they are resources that they need to complete their own task. Some tasks, while possible, are designed to waste time and effort to some extent.

Between each round, teams discuss their progress, how their collaborations are progressing and how they might tackle the next set of tasks. The facilitator marks the submissions from the rounds, discloses the scores – hamming it up usually goes over well – and then gives out the materials for the next round.

After the final round, the facilitator leads the team through a discussion on collaboration, and can tailor it to any way that seems appropriate.

# **NonZeroSum Session Overview**

## 90 Minute Overview

NonZeroSum can be used in many different ways; it is presented here as a session that starts discussions and conversations about good collaboration skills and the barriers to good collaboration.

Time	Activity	Process	Notes
Before	Setup	Arrange two tables for participants. Tables should have six felt pens, a stack of plain A4 paper and a small amount of Blu-Tack.	
00:00	Introduction	Talking about collaboration – the aims of the session are to get people thinking about collaboration and what it means.  Three rounds, three tasks per round. Fifteen minutes per round. All of the info is on the task cards that will be handed out. Resources will be provided. Participants are free to talk to members of the other team at any point. Handout short overview.	
00:05	Round 1	Fifteen mins: Who Are You? Participants' Dilemma The PIN  The tasks have very little overlap between the two teams. There is nothing which compels them to interact, but they will accomplish more in Who Are You? and potentially Participants' Dilemma if they do.	Each team needs/receives: <ul style="list-style-type: none"> <li>• a sheet of flipchart paper</li> <li>• an envelope</li> <li>• two small pieces of card</li> </ul> <p>During this round, the facilitator should create an appropriate scoreboard (flipchart/whiteboard).</p>
00:20	Intermission	Team discussions while outputs are marked and checked.  How did that work for you? What worked well? How would you approach the tasks if you could now go back in time fifteen minutes?  Teams discuss and keep points for themselves, to bear in mind while they start the next round.  Give out scores. Introduce second round.	
00:25	Round 2	Fifteen mins: 20 Questions The Deal Why Did The Chicken Cross The Road?  Tasks require greater inter- and intra-team	Each team needs/receives: <ul style="list-style-type: none"> <li>• five cards with famous people's names</li> <li>• 26 playing cards</li> </ul>

		cooperation and collaboration. 20 Questions requires the teams to work together. The Deal requires them to swap cards and information. Why Did The Chicken Cross The Road? does not require teams to collaborate, but may lead to novel outcomes if they did.	Why Did The Chicken Cross The Road? Is timed such that teams submit their lists 5 minutes before the end of the round, to allow the facilitator to mark them.
00:40	Intermission	Team discussions while outputs are marked and checked.  How did your performance compare to the first round? What did you do differently in your approach? How are you going to approach the tasks in the final round?  Give out scores. Introduce third round.	
00:45	Round 3	Fifteen mins: Collaboration's DNA Mastermind Making Shapes  Making Shapes requires that teams swap resources in terms of paper. They can also swap rulers and scissors.  Mastermind encourages teams to think outside of the box and compare their situations.	Each team needs/receives: <ul style="list-style-type: none"> <li>• Six sheets of coloured card (as detailed in the overview)</li> <li>• Scissors and rulers (as detailed in the overview)</li> <li>• Slips of coloured paper</li> </ul> <p>Making Shapes is timed such that teams submit their shapes 2 minutes before the end of the round, to allow the facilitator to mark them.</p>
01:00	Quick Marking	Teams talk about progression. What has changed about their approaches to the tasks over the last hour?  Give out final scores – and make the point that it was not about beating the other team, but scoring the best for your own team.	
01:05	Discussion	Use one of the discussion activities detailed.	
01:30	Finish		

## Resources

At the start of the session, each team should have a short stack of plain A4 paper, six coloured felt pens (at least three different from each other) and some Blu-Tack.

## Overview of Rounds

### Round 1

In the first round there are three tasks, and there is minimal interaction between the two teams.

#### Who Are You?

A task that doubles as an icebreaker for the two teams.

Teams learn about one another and share what they learn in a poster.

The teams can only achieve full marks by cooperating/collaborating with each other and sharing resources.

#### Participants' Dilemma

The points awarded to teams for this task depend strictly on what they do; they can talk to each other, they can discuss what they want to do or they can just act without talking to each other.

#### The PIN

A logic puzzle. Both teams receive the same information and do not need to talk to each other in order to complete the task.

A series of clues leads to working out a numerical code.

### Resources

A sheet of flipchart paper per team.

Two small cards and one envelope per team.

### Marking and Scoring

Who Are You?	40 points max	Facilitator checks submitted posters according to criteria.
Participants' Dilemma	-5 to 15 points	Facilitator scores teams against the criteria of the exercise.
The PIN	20 points	Teams get 20 points for the correct answer: 40597

## Round 2

In the second round there are three tasks, and there is more interaction between the teams. Teams must share resources and information in order to achieve full marks in one of the tasks. In another task they must keep time well both for their completion of a task and for the other team.

### 20 Questions

Teams are given cards with the names of five famous people on. They pick one, and then try to guess the identity of one that the other team has, while the other team tries to guess theirs. Teams are awarded points based on how quickly they deduce the identity of the famous person.

### The Deal

Team 1 works out the arrangement of 20 cards, with Diamonds and Clubs. Team 2 works out the arrangement of 20 cards, with Hearts and Spades. Both teams are given instructions on the order of a 2 by 10 grid of cards, but do not have enough to work it out completely. They will not have all of the cards that they need in order to lay things out by hand, and they will have information which could help the other team.

### Why Did The Chicken Cross The Road?

An idea generation task.

Teams produce a numbered list of ideas. Points are awarded for each idea, with a bonus to a team if they have an idea which the other team have not thought of. Both teams must submit their sheet of ideas **five minutes before the end of the task**.

### Resources

Each team has a set of five cards with names of famous people.

Each team is given half of a deck of playing cards, 26 cards, that are mostly from the suits that their problem deals with. They should be given some cards from the other teams half of the deck.

Each team has its own sheet to fill in with their answer for The Deal.

### Marking and Scoring

20 Questions	50 points max	Teams score themselves and report back to the facilitator.
The Deal	40 points max	Teams submit their answer sheets and the facilitator compares their submission to the mark sheet.
Why Did The Chicken Cross The Road?	5 points per idea, plus possible bonus	Teams submit lists five minutes before the end of the round; facilitator marks 5 points per idea, plus a 5 point bonus if it is an idea the other team did not have.

## Round 3

In the third round there are three tasks, and there is much more interaction between the teams: in this round teams will have information/resources that they need, but which also are required by the other team to complete their tasks. The second and third tasks are slightly different for the two teams, but are identical in their mechanisms. The third task overlaps in the resources required by each team.

### Collaboration's DNA

A creative exercise to make teams think about what they know about collaboration and what they've experienced.  
The task is identical for both teams.

### Mastermind

A quiz. Questions are mostly general knowledge but some lateral thinking is required to answer several questions.  
Teams answer by writing answers on coloured slips of paper/card, with cards having different point values based on colour.  
Questions are identical for the two teams. Teams score differently based on the colours they use.

### Making Shapes

Each team has to produce a set of coloured shapes (squares, rectangles, triangles) – of various sizes – from different coloured card. Each team has different sets of shapes to produce, points are awarded for each thing they produce – but the opposite team has resources that they need which will help.

### Resources

Each team is given ten slips of coloured paper for Mastermind: three red, four yellow, three blue. They also receive an answer sheet to stick these slips to. Cut slips so that they fit in the spaces.

For Making Shapes, Team 1 receives three pairs of scissors, one 15cm plastic ruler and six sheets of coloured A5 paper: two green, two yellow, two orange.

For Making Shapes, Team 2 receives one pair of scissors, three 15cm plastic rulers and six sheets of coloured A5 paper: two green, two yellow, two pink.

### Marking and Scoring

Collaboration's DNA	65 points max	Facilitator awards 5 points per letter used.
Mastermind	100 points max	Teams submit their answer sheets and the facilitator compares their submission to the mark sheet, and awards points based on correct answers and the colour of paper used
Making Shapes	50 points max	Teams submit shapes two minutes before the end of the round. Facilitator marks 5 points per correct shape.

## **Debriefs and Discussions**

Following the scores being read out, it is important to emphasise, as it says on the first handout for participants, that the point was not to “win” merely to do the best possible for their team – which inevitably means collaborating and cooperating within the team and with the other team (who were also trying to do the same).

A game is a simulation that shows some aspects of situations in the real world. While the tasks given to participants are different from tasks that they might have to do every day as researchers, the core skills involved are very similar. Following the final round is a good time to reflect and discuss on several possible aspects of collaboration. The following are all suggestions for things to discuss, and ways to start those conversations.

### **What promotes good collaboration?**

Ask participants to privately write things on post it notes that are needed in order to facilitate good collaborations. Then they post them up to a flip chart; group similar things and then start a discussion based on what has been put up. See how much common ground people have identified. A good closing question might be to ask people if anything else is missing, or perhaps which of these things are hard.

### **Experience of good collaboration?**

For a cohort with some experience of collaboration you could get participants to pair up and share their stories of collaboration; when have they worked well? What was it about that situation that allowed them to collaborate well? What did they learn?

### **What was missing in terms of collaboration?**

NonZeroSum is a game, and hopes to highlight lots of different aspects of collaboration, and to give people some experiences to think about. But what was missing? What makes up real world collaborations? In teams or pairs, brainstorm what is required for successful collaborations, then share those thoughts with the rest of the cohort.

### **What are the main barriers to successful collaboration?**

Teams discuss and come up with three/four/five of the barriers that stop collaboration from taking place. They write these on flipchart paper, leaving space around them. Teams swap flips, and then brainstorm specific and concrete actions that could be taken to address those barriers – what could be done to improve situations or stop them from happening in the first place?

### **What – specifically – can be done to improve collaborations?**

Ask people to pair up with someone from the other team. Give them a few minutes to discuss the session from the perspective within each team; ask them to discuss how things improved over the course of the session. What actions were taken? What new approaches? Now, get them to brainstorm three specific things that could be taken from this experience and applied to real life collaborations. Then bring out the learning points as a whole cohort.

## Kit List

Copies of all of the handouts in the next section need to be made, one per team. It is important that they go to the correct team, owing to some of the information that is on them. A handout for Team 1 has “Team 1” in the top left corner, and next to it will be the round that the task is for, with the same for Team 2's handouts.

For the pilot sessions I printed on specific coloured paper for each team to avoid any confusion.

Teams also need copies of the submission sheets for various tasks.

The material requirements for each round are listed after each section previously. To summarise them though:

- Ongoing – these placed on tables before start.
  - Short stack of plain A4 paper per team.
  - Six different coloured felt tips per team (with three different from the other team).
  - A small amount of Blu-Tack per team.
- Round 1
  - A sheet of flipchart paper per team.
  - Two small cards and one envelope per team.
- Round 2
  - The answer sheet for The Deal, one per team.
  - Five cards with names of famous people, five per team (ten different in total).
  - Half a shuffled deck of playing cards per team.
- Round 3
  - The answer sheet for Mastermind – make sure that teams have correct sheets.
  - Team 1: three pairs of scissors, one 15cm plastic ruler and six sheets of coloured A5 paper: two green, two yellow, two orange.
  - Team 2: one pair of scissors, three 15cm plastic rulers and six sheets of coloured A5 paper: two green, two yellow, two pink.
- Debrief/Discussion
  - Flipchart paper, pens, post it notes.

Facilitators need copies of the participant briefs and handouts, as well as copies of the cheat sheets with answers.

# **NonZeroSum Participant Task Briefs**

**Team 1, Round 1**

**Up to 40 points**

## **Who Are You?**

it is important for people working collaboratively to know who they're working with. Produce a poster showing that you know something about your team. At a minimum it must display each person's

- Name
- Where they're from
- What they research and why they like research
- One thing that makes them the “odd one out” in the team (a hobby, a life experience, etc)

Produce a poster, give your team a name, and display all of the information requested including a quick sketch of each person and a picture that represents the thing that makes them the “odd one out”.

Points will be awarded as follows:

- **5 points** for everyone on poster and a team name
- **5 points** for more than six coloured pens used
- **10 points** for all the information requested
- **10 points** for a sketch of each person
- **10 points** for pictures that represents each person's “odd one out”

If more than 40 words are used on the poster, **10 points** will be deducted.

**Team 1, Round 1**

**-5 to 15 points**

## **Participants' Dilemma**

Collaboration often involves an element of creativity. Two more 'C' words that are relevant: cooperation and compromise. We have to find a balance between the goals of team work and our own personal goals.

This task should not take too much time: write one of two words on a slip of paper, place it in the envelope provided and hand it to the session leader. The two words are **ANT** and **CAT**.

- If both teams write **ANT** on their paper then they will each receive **10 points**.
- If one team writes **ANT** and the other writes **CAT**, the team that writes **ANT** will receive **0 points** and the team that writes **CAT** will receive **15 points**.
- If both teams write **CAT** then they will both lose **5 points**.

Both teams have received the **same information**, and **may confer at any time**. Both teams **must** submit their envelope before the end of this round.

**Team 1, Round 1**

**20 points**

## **The PIN**

Your uncle has a numeric code for the safe in his study. He's quite forgetful, and a little paranoid, so rather than carry the PIN on a scrap of paper he has a card with a series of clues that help him deduce the PIN.

He asks you to fetch something from the safe, and gives you the card with the clues.

- Digit four is 1 more than twice digit one.
- The sum of the digits is 25 and the product is 0.
- The code has five distinct digits.
- Digit five is 2 more than digit three.
- Digit four is 1 less than twice digit three.

Your uncle, as well as being forgetful and paranoid, can also be a little impatient. What is the code to get access to the safe?

**Team 1, Round 2**

**Up to 50 points**

## **20 Questions**

You have an envelope containing cards displaying 5 famous people. The other team has an envelope containing 5 **different** famous people. Each team must select one card from their set, using whatever criteria they wish for the purposes of this task.

Ask questions with yes or no answers to determine the identity of the famous person the other team has selected. The other team will ask yes/no questions of you to try to determine your famous person.

Both teams have 20 questions in order to work out which famous person the opposing team has on their card. If you are able to work out which famous person the opposing team has you will be awarded **5 points for every question that you have left**, up to a **maximum of 50 points**.

Both teams must complete this task by the end of the round, or **both** automatically score **0 points** for this task.

# Team 1, Round 2

40 points

## The Deal

The following clues describe how some cards from a standard deck of playing cards have been dealt into a rectangle with two rows of ten cards. Your task is to reconstruct the deal on the answer sheet attached, using the notation A♥ to represent the Ace of Hearts, J♣ to represent Jack of Clubs, 9♦ to represent the 9 of Diamonds, etc.

The left-most card on the top line is the 3 of Clubs.	In the top row a 6 is next to the 10 of Clubs.
Each number appears once and only once in a row.	The 7 of Clubs is above the 7 of Diamonds.
There is a 4 over a 3.	On the bottom line an Ace, 9 and 4 are in a row, running left to right.
A 7, 9 and Ace are in a row on the top line, running right to left.	The 4 of Diamonds is beneath the 10 of Clubs.
The right-most card on the bottom line is the 10 of Diamonds.	The other team has relevant information for you.
There is a 6 over the 8 of Diamonds.	All of your cards are numbers (i.e., no Kings, Queens, Jacks).
The 7s are the only types that are paired up.	On the top line, one would see a 5 before one sees the 8 of Clubs, when looking left to right.
The other team has all Hearts on the top row.	The 4, 2 and 6 of Clubs are in a row on the top line, running right to left.
The 5 of Diamonds is under the Ace of Clubs.	The other team needs only Hearts and Spades for their arrangement.
The other team's deal is similar to yours, but not identical.	The 2 of Diamonds, 7 of Diamonds and 3 of Diamonds are in a row running right to left.

Your team will receive 2 points for each card correctly placed.

**Team 1, Round 2**

**See below**

## **Why Did The Chicken Cross The Road?**

“To get to the other side” is perhaps the most well known answer to this question, but there are many, many more which might be plausible, humorous or just plain illogical.

Your task is one of idea generation, specifically, of thinking of answers to the question at the top of this page, “Why did the chicken cross the road?” Your answers could be rooted very much in the real world, thinking about the needs and life of a chicken, or they could be more humorous, thinking about the question's origin as a joke. Your ideas must be sensible: **non sequiturs will be discounted.**

You will score **5 points** for each idea, plus a bonus of **5 points** for each idea that the other team don't have.

A **numbered list** of your ideas must be submitted to the session leader **at least 5 minutes before the end** of the round to allow points to be calculated. All decisions of the session leader are final!

**Team 1, Round 3**

**Up to 65 points**

## **Collaboration's DNA**

What does collaboration mean? What makes up a collaborative task? Are there lots of things which could be classed as collaboration?

After two rounds of tasks related to collaboration, and building on your experience, put together an acronym or mnemonic for the word **COLLABORATION**: a series of descriptors to help convey what collaboration is about. If it helps, think about the project management acronym SMART (Specific, Measurable, Achievable, Relevant, Time-bound) as a starting point.

Write this out on one sheet of A4: there are 13 letters in **COLLABORATION**, and you will receive **5 points** for each descriptor that you produce.

## Team 1, Round 3

Up to 56\* points

# Mastermind

A test of your combined general knowledge and lateral thinking. Answers must be written on the slips of coloured paper (provided) and affixed to the answer board with Blu-tack. Correct answers receive **10 points** if written on red paper, **5 points** if on yellow paper, **2 points** if on blue paper.

1. Where would you find the Ministries of Love, Peace, Truth and Plenty?
2. Which of these words is the odd one out?  
PART    PINT    FLOW    LIVE
3. Which three countries have the largest surface area?  
(three separate answers, order unimportant)
4. Compared to the Earth, how many times greater is the diameter of the Sun?  
19        109        1009
5. Here are the first nine numbers in a sequence:  
3 3 5 4 4 3 5 5 4  
What is the next number in the sequence?
6. True or false: the closest translation from Japanese to English of the word “sushi” is “raw fish.”
7. What word connects the following words?  
BOXING    TELEPHONE    WEDDING
8. What is the sum of the integers from 1 to 100?

*The decision of the session leader on answers is final!*

\*It is possible to score more than the maximum for this task. As with any of the other tasks you are free to talk to the other team who have exactly the same **questions** as you.

# Making Shapes

A challenge to make things to order: make the following using the resources available. You will be awarded **5 points** for each of the shapes that you make. Write your team name on each shape. All shapes must be submitted to the session leader for checking **two minutes** before the end of the round.

- An orange square, sides of length 10cm.
- A pink rectangle, 15cm by 5cm, with a 5cm equilateral triangle on one end.
- An orange equilateral triangle, sides of length 10cm.
- A green right-angled triangle, sides of length 9cm, 12cm, 15cm.
- A yellow equilateral triangle, sides of length 15cm.
- A pink right-angled triangle, sides of length 12cm, 16cm, 20cm.
- A yellow rectangle, 10cm by 5cm.
- A green square, sides of length 12cm.
- A pink rectangle, 2cm by 22cm.
- A yellow pentagon, all sides 6cm.

The other team have different resources and objectives.

**Team 2, Round 1**

**Up to 40 points**

## **Who Are You?**

it is important for people working collaboratively to know who they're working with. Produce a poster showing that you know something about your team. At a minimum it must display each person's

- Name
- Where they're from
- What they research and why they like research
- One thing that makes them the “odd one out” in the team (a hobby, a life experience, etc)

Produce a poster, give your team a name, and display all of the information requested including a quick sketch of each person and a picture that represents the thing that makes them the “odd one out”.

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- **10 points** for a sketch of each person
- **10 points** for pictures that represents each person's “odd one out”

If more than 40 words are used on the poster, **10 points** will be deducted.

## Team 2, Round 1

-5 to 15 points

# Participants' Dilemma

Collaboration often involves an element of creativity. Two more 'C' words that are relevant: cooperation and compromise. We have to find a balance between the goals of team work and our own personal goals.

This task should not take too much time: write one of two words on a slip of paper, place it in the envelope provided and hand it to the session leader. The two words are **ANT** and **CAT**.

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Both teams have received the **same information**, and **may confer at any time**. Both teams **must** submit their envelope before the end of this round.

# The PIN

Your uncle has a numeric code for the safe in his study. He's quite forgetful, and a little paranoid, so rather than carry the PIN on a scrap of paper he has a card with a series of clues that help him deduce the PIN.

He asks you to fetch something from the safe, and gives you the card with the clues.

- Digit four is 1 more than twice digit one.
- The sum of the digits is 25 and the product is 0.
- The code has five distinct digits.
- Digit five is 2 more than digit three.
- Digit four is 1 less than twice digit three.

Your uncle, as well as being forgetful and paranoid, can also be a little impatient. What is the code to get access to the safe?

**Team 2, Round 2**

**Up to 50 points**

## **20 Questions**

You have an envelope containing cards displaying 5 famous people. The other team has an envelope containing 5 **different** famous people. Each team must select one card from their set, using whatever criteria they wish for the purposes of this task.

Ask questions with yes or no answers to determine the identity of the famous person the other team has selected. The other team will ask yes/no questions of you to try to determine your famous person.

Both teams have 20 questions in order to work out which famous person the opposing team has on their card. If you are able to work out which famous person the opposing team has you will be awarded **5 points for every question that you have left**, up to a **maximum of 50 points**.

Both teams must complete this task by the end of the round, or **both** automatically score **0 points** for this task.

## Team 2, Round 2

40 points

### The Deal

The following clues describe how some cards from a standard deck of playing cards have been dealt into a rectangle with two rows of ten cards. Your task is to reconstruct the deal on the answer sheet attached, using the notation A♥ to represent the Ace of Hearts, J♣ to represent Jack of Clubs, 9♦ to represent the 9 of Diamonds, etc.

The left-most card on the top line is the 3 of Hearts.	In the top row a 6 is next to the 10 of Hearts.
Each number appears once and only once in a row.	The 7 of Hearts is above the 7 of Spades.
There is a 4 over a 3.	On the bottom line an Ace, 9 and 4 are in a row, running left to right.
A 7, 9 and Ace are in a row on the top line, running right to left.	The 4 of Spades is beneath the 10 of Hearts.
The right-most card on the bottom line is the 10 of Spades.	The other team has relevant information for you.
There is a 6 over the 8 of Spades.	All of your cards are numbers (i.e., no Kings, Queens, Jacks).
The 7s are the only types that are paired up.	On the top line, one would see a 5 before one sees the 8 of Hearts, when looking left to right.
The other team has all Clubs on the top row.	The 4, 2 and 6 of Hearts are in a row on the top line, running right to left.
The 5 of Spades is under the Ace of Hearts.	The other team needs only Clubs and Diamonds for their arrangement.
The other team's deal is similar to yours, but not identical.	The 2 of Spades, 7 of Spades and 3 of Spades are in a row running right to left.

Your team will receive 2 points for each card correctly placed.

**Team 2, Round 2**

**See below**

## **Why Did The Chicken Cross The Road?**

“To get to the other side” is perhaps the most well known answer to this question, but there are many, many more which might be plausible, humorous or just plain illogical.

Your task is one of idea generation, specifically, of thinking of answers to the question at the top of this page, “Why did the chicken cross the road?” Your answers could be rooted very much in the real world, thinking about the needs and life of a chicken, or they could be more humorous, thinking about the question's origin as a joke. Your ideas must be sensible: **non sequiturs will be discounted.**

You will score **5 points** for each idea, plus a bonus of **5 points** for each idea that the other team don't have.

A **numbered list** of your ideas must be submitted to the session leader **at least 5 minutes before the end** of the round to allow points to be calculated. All decisions of the session leader are final!

**Team 2, Round 3**

**Up to 65 points**

## **Collaboration's DNA**

What does collaboration mean? What makes up a collaborative task? Are there lots of things which could be classed as collaboration?

After two rounds of tasks related to collaboration, and building on your experience, put together an acronym or mnemonic for the word **COLLABORATION**: a series of descriptors to help convey what collaboration is about. If it helps, think about the project management acronym SMART (Specific, Measurable, Achievable, Relevant, Time-bound) as a starting point.

Write this out on one sheet of A4: there are 13 letters in **COLLABORATION**, and you will receive **5 points** for each descriptor that you produce.

## Team 2, Round 3

Up to 56\* points

# Mastermind

A test of your combined general knowledge and lateral thinking. Answers must be written on the slips of coloured paper (provided) and affixed to the answer board with Blu-tack. Correct answers receive **10 points** if written on blue paper, **5 points** if on yellow paper, **2 points** if on red paper.

1. Where would you find the Ministries of Love, Peace, Truth and Plenty?
2. Which of these words is the odd one out?  
PART   PINT   FLOW   LIVE
3. Which three countries have the largest surface area?  
(three separate answers, order unimportant)
4. Compared to the Earth, how many times greater is the diameter of the Sun?  
19      109      1009
5. Here are the first nine numbers in a sequence:  
3 3 5 4 4 3 5 5 4  
What is the next number in the sequence?
6. True or false: the closest translation from Japanese to English of the word “sushi” is “raw fish.”
7. What word connects the following words?  
BOXING   TELEPHONE   WEDDING
8. What is the sum of the integers from 1 to 100?

*The decision of the session leader on answers is final!*

\*It is possible to score more than the maximum for this task. As with any of the other tasks you are free to talk to the other team who have exactly the same **questions** as you.

# Making Shapes

A challenge to make things to order: make the following using the resources available to you. You will be awarded **5 points** for each of the shapes that you make. Write your team name on each completed shape. All items must be submitted to the session leader for checking **two minutes** before the end of the round.

- An orange square, sides of length 10cm.
- A yellow rectangle, 15cm by 5cm, with a 5cm equilateral triangle on one end.
- An orange equilateral triangle, sides of length 10cm.
- A green right-angled triangle, sides of length 9cm, 12cm, 15cm.
- A pink equilateral triangle, sides of length 15cm.
- A yellow right-angled triangle, sides of length 12cm, 16cm, 20cm.
- A pink rectangle, 10cm by 5cm.
- A green square, sides of length 12cm.
- A yellow rectangle, 2cm by 22cm.
- A pink pentagon, all sides 6cm.

Note: the other team has different resources and objectives.

# **NonZeroSum Participant Answer Sheets and Task Resources**

**Cards for 20 Questions Task**

<b>Barack Obama</b>	<b>Luke Skywalker</b>
<b>Sherlock Holmes</b>	<b>Matt Damon</b>
<b>William Shakespeare</b>	<b>Charles Dickens</b>
<b>The Queen</b>	<b>Angelina Jolie</b>
<b>Kylie Minogue</b>	<b>J.K. Rowling</b>

# Team 1, Round 2

40 Points

## The Deal

Using the clues on the other sheet, fill in this grid to show the arrangement of the cards that have been dealt. Use the notation A♥ to represent the Ace of Hearts, J♣ to represent Jack of Clubs, 9♦ to represent the 9 of Diamonds, etc.


**40 points** for a complete table; incomplete or incorrect tables get **2 points** for every correctly placed card.

## Team 2, Round 2

40 Points

### The Deal

Using the clues on the other sheet, fill in this grid to show the arrangement of the cards that have been dealt. Use the notation A♥ to represent the Ace of Hearts, J♣ to represent Jack of Clubs, 9♦ to represent the 9 of Diamonds, etc.


**40 points** for a complete table; incomplete or incorrect tables get **2 points** for every correctly placed card.

# Team 1, Round 3

# Up to 56\* Points

## Mastermind

Attach the slips with your answers to the table below using Blu-tack.

1)	4)
2)	5)
3a)	6)
3b)	7)
3c)	8)

Remember that correct answers on red paper will receive **10 points**, **5 points** if on yellow paper, **2 points** if on blue paper.

## Team 2, Round 3

Up to 56\* Points

### Mastermind

Attach the slips with your answers to the table below using Blu-tack.

1)	4)
2)	5)
3a)	6)
3b)	7)
3c)	8)

Remember that correct answers on blue paper will receive **10 points**, **5 points** if on yellow paper, **2 points** if on red paper.

# **NonZeroSum Facilitator Cheat Sheets**

## Round 1 Answers

Up to 40 Points

# Who Are You?

Mark each team's poster, which must have the following information for each person

- Name
- Where they're from
- What they research and why they like research
- One thing that makes them the “odd one out” in the team (a hobby, a life experience, etc)

It should also have a team name, a quick sketch of each person and a picture that represents each person's “odd one out”.

Give points for the following:

- **5 points** for everyone on poster and a team name
- **5 points** for more than six coloured pens used
- **10 points** for all the information requested
- **10 points** for a sketch of each person
- **10 points** for pictures that represents each person's “odd one out”

If more than 40 words are used on the poster, deduct **10 points**.

## Round 1 Answers

-5 to 15 points

### Participants' Dilemma

Award marks according to the following:

- If Team 1 writes **ANT** on their card and Team 2 writes **ANT** on their card award each team **10 points**.
- If Team 1 writes **ANT** on their card and Team 2 writes **CAT** on their card award Team 1 **0 points**, and award Team 2 **15 points**.
- If Team 1 writes **CAT** on their card and Team 2 writes **ANT** on their card award Team 1 **15 points**, and award Team 2 **0 points**.
- If Team 1 writes **CAT** on their card and Team 2 writes **CAT** on their card award each team **-5 points**.

## Round 1 Answers

20 points

### The PIN

The correct answer, deduced from the clues, is **40597**.  
This is the only answer.

## Round 2 Answers

40 Points

### The Deal

Both teams submit a sheet similar to this with their answers, using the notation A♥ to represent the Ace of Hearts, J♣ to represent Jack of Clubs, 9♦ to represent the 9 of Diamonds, etc.

For Team 1

- all of the cards in the top row are Clubs
- all of the cards on the bottom row are Diamonds

For Team 2

- all of the cards in the top row are Hearts
- all of the cards in the bottom row are Spades

The numbers across the rows are as follows:

3	5	10	6	2	4	7	9	A	8
A	9	4	8	6	3	7	2	5	10

**40 points** for a complete table; incomplete or incorrect tables get **2 points** for every correctly placed card.

## Round 2 Answers

Up to 50 points

## 20 Questions

Teams police themselves in the scoring of this exercise and report back how many questions they used. If they correctly deduce which famous person the opposing team has selected they are awarded **5 points for every question that you have left**, up to a **maximum of 50 points**.

Both teams must complete this task by the end of the round, or **both** automatically score **0 points** for this task.

## Round 2 Answers

See below

## Why Did The Chicken Cross The Road?

Teams submit **numbered lists** of their ideas, and receive **5 points** for each idea, plus a bonus of **5 points** for each idea that the other team don't have.

Lists must be submitted **at least 5 minutes before the end** of the round to allow points to be calculated. If there are any doubts as to points that should be awarded enforce the line that “All decisions of the session leader are final!”

## Round 3 Answers

Up to 100 points

# Mastermind

Teams answer using slips of coloured paper and stick them to their answer boards with Blu-tack.

1. Where would you find the Ministries of Love, Peace, Truth and Plenty?

**The novel Nineteen Eighty-Four by George Orwell.**

2. Which of these words is the odd one out?

PART PINT FLOW LIVE

**The others, when their letters are reversed, still form words (TRAP, WOLF, EVIL).**

3. Which three countries have the largest surface area?

**Russia, Canada, People's Republic of China**

4. Compared to the Earth, how many times greater is the diameter of the Sun?

19 109 1009

5. Here are the first nine numbers in a sequence:

3 3 5 4 4 3 5 5 4

What is the next number in the sequence? **3, the sequence is the number of letters in the numbers, i.e., “one (3), two (3), three (5), ..., nine (4), ten (3).”**

6. True or false: the closest translation from Japanese to English of the word “sushi” is “raw fish.” **FALSE**

7. What word connects the following words?

BOXING, TELEPHONE, WEDDING = **RING**

8. What is the sum of the integers from 1 to 100?

**5050**

Team 1 receives, for correct answers, **10 points** if written on red paper, **5 points** if on yellow paper, **2 points** if on blue paper. Team 2 receives **10 points** if written on blue paper, **5 points** if on yellow paper, **2 points** if on red paper. Teams score highly by trading coloured paper, answers (possibly) and by re-cutting paper.

## Round 3 Answers

Up to 65 points

# Collaboration's DNA

Teams submit a series of descriptors on a sheet of A4 paper, listed as the letters in **COLLABORATION**, and are awarded **5 points** for each descriptor/word, up to a maximum of **65 points**.

If it helps, think about the project management acronym SMART (Specific, Measurable, Achievable, Relevant, Time-bound) as a starting point for what they might submit. Award marks for anything sensible. These words make great discussion starters after the final round.

## Round 3 Answers

Up to 50 points

# Making Shapes

Teams submit shapes cut from coloured paper **two minutes** before the end of the round. They are awarded **5 points** for each shape from their list that they make, with a **maximum of 50 points** for all 10 shapes.

The teams have different shapes to make.

Team 1	Team 2
<ul style="list-style-type: none"><li>• An orange square, sides of length 10cm.</li><li>• A pink rectangle, 15cm by 5cm, with a 5cm equilateral triangle on one end.</li><li>• An orange equilateral triangle, sides of length 10cm.</li><li>• A green right-angled triangle, sides of length 9cm, 12cm, 15cm.</li><li>• A yellow equilateral triangle, sides of length 15cm.</li><li>• A pink right-angled triangle, sides of length 12cm, 16cm, 20cm.</li><li>• A yellow rectangle, 10cm by 5cm.</li><li>• A green square, sides of length 12cm.</li><li>• A pink rectangle, 2cm by 22cm.</li><li>• A yellow pentagon, all sides 6cm.</li></ul>	<ul style="list-style-type: none"><li>• An orange square, sides of length 10cm.</li><li>• A yellow rectangle, 15cm by 5cm, with a 5cm equilateral triangle on one end.</li><li>• An orange equilateral triangle, sides of length 10cm.</li><li>• A green right-angled triangle, sides of length 9cm, 12cm, 15cm.</li><li>• A pink equilateral triangle, sides of length 15cm.</li><li>• A yellow right-angled triangle, sides of length 12cm, 16cm, 20cm.</li><li>• A pink rectangle, 10cm by 5cm.</li><li>• A green square, sides of length 12cm.</li><li>• A yellow rectangle, 2cm by 22cm.</li><li>• A pink pentagon, all sides 6cm.</li></ul>

# **NonZeroSum Future Development**

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If you decide to develop or modify these resources – and I would encourage you to do so – then you should acknowledge my work on the second page of the document, add your own name (after all, you should get credit for what you've done) and make sure that the Creative Commons BY-NC-SA License is still displayed.

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This should be in a legible font, and if your adaptation is based on work by others then their names should be credited in the second line as “This work adapted by ... following modifications by ...”

It would be nice to hear from you if you have made some cool changes to NonZeroSum, or found some novel uses for it; this just adds to the ongoing conversation and collaboration of the resources, plus it is always nice to hear that people are using it. Feel free to get in touch with me via my website, <http://www.nathanryder.co.uk>

## **Suggestions for Adaptation and Modification**

During the piloting of these resources I asked for lots of feedback. Some was to gauge how interesting and challenging the tasks were while they were only recently completed. This helped me to fine tune some of the tasks, especially The Deal.

The qualitative feedback that I sourced from participants and observers was very interesting. Requests for support resources mostly went beyond the scope of what I could provide with NonZeroSum at the piloting stage, and I present these suggestions here as they might be useful to when you come to plan a session based around NonZeroSum. Through feedback from participants and observers I got some great suggestions for further adaptations of the resources, which I present here with some thoughts of my own.

I'm tempted to have a go at them myself at some point.

One university has told me that they intend to translate the resources for a Welsh language audience, an adaptation that I had not foreseen but that I am happy is happening.

## **Support Resources**

Participants asked for resources ranging from websites to slides, takeaway handouts, examples and models of collaboration. NonZeroSum was designed to be adapted further, but it was also designed to be what it is currently, and so many of these things that participants thought would be good were beyond the scope of the materials at this point. However, in future adaptations they might be very useful to have.

## **Ideas for Further Adaptations**

- Changing part of the structure
  - Having longer breaks between rounds and giving specific discussion activities that have to be reported on.
  - Having a formal break in between some of the rounds to allow for networking.
- Changing the dynamic
  - Appointing observers to feedback to teams in between rounds.
  - Appointing team leaders for rounds, or asking teams to appoint a leader/coordinator.
- New tasks
  - Creative tasks: making a picture, sculpture, presentation, short document.
  - Puzzles: crosswords, word searches, logic problems, quizzes.
  - Managing Resources: building models, completing jigsaws – with the other team in possession of vital piece.
- Using the session as a basis for something else
  - Having an afternoon or day of tasks that people can attempt, either in rounds or as an ongoing activity.
  - Use as an icebreaker to introduce people to one another, to realise early on in a larger event strengths that people have.

As with the Welsh language adaptation, there are many more possible adaptations that could be made, and I'll never think of them all. Collaboration is crucially about making something with others: what will you do with NonZeroSum, and who will you adapt it with?