



## Volunteer Handbook

Number Partners is a volunteering scheme designed to support people with their number skills in schools





Number Partners is a volunteering scheme designed to support young people with their number skills in schools. Volunteers from business and the community play specially designed numeracy games with young people, providing a great confidence boost. Number Partners provides the materials, expertise and support to sustain high quality relationships at a local level. As a national organisation, it works with local partners in over 60 locations in the United Kingdom.

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## Congratulations on becoming a Number Partner

**Welcome to the new Number Partners Handbook**, which will provide you with all of the essential information you need to get started as a volunteer in schools.

The Handbook contains:

- Facts about the programme and the teaching of numeracy skills in schools.
- Activities to support your initial training.
- Essential documentation to use within your sessions.

The Number Partners scheme, set up in 1998, by Tower Hamlets EBP to provide schools with individual maths support for pupils, was launched nationally in 2001. Evidence indicates that not only do volunteers help in supporting young people's maths, but are also vitally important in the development of their personal and social skills.

Number Partners volunteers are highly valued in schools and they are in great demand. To support their learning, young people need interaction with caring adults who give them this support and encouragement. It is generally agreed that a committed adult can be a crucial factor in encouraging pupils to see maths as fun and exciting. Support, praise for their efforts and patience are key ingredients in a young person's progress. This is what a Number Partners volunteer – you – can provide.

Developed with:



**The aims of the programme are to:**

- Support schools in raising achievement in numeracy.
- Improve young people's number skills.
- Support the development of interpersonal skills for targeted pupils.
- Enhance young people's mental skills in numeracy
- develop young people's confidence and motivation to learn.
- Give young people a positive insight into the business world.

The very special thing about Number Partners is the time that the individual pupils spend with an adult. At school there is often very little opportunity for pupils to receive this individual attention and for some, it isn't always possible to get this support at home for a variety of reasons.



# Section 1

## Being a Number Partners volunteer

Being a volunteer on this scheme is a very rewarding experience. As well as giving a lot to the pupils you will be supporting, you will gain from this experience personally. Not only do current volunteers talk positively about their input to the local community, but they also report feeling more confident to address a range of audiences and feeling more motivated at work.

**“What are the benefits of the scheme?”**

● **To the school pupils?**

- Meeting interested and committed adults.
- Getting more individual maths support and attention.
- Having regular opportunities for practising maths skills, for example counting, adding, subtracting, multiplying.
- Having regular opportunities for one-to-one discussion to improve confidence with numbers.

● **To me, as a volunteer?**

- Contributing to the achievements of young people.
- Collaborating with colleagues on a worthwhile project.
- Opportunity to do voluntary work with young people.
- Doing something positive in the lunch hour.
- Developing interpersonal and communication skills.

● **To my employer?**

- Raising motivation and morale among employees.
- Providing opportunities for self-development.
- Promoting team building.
- Building a positive company image both internally and externally.
- Developing time management skills.
- Fulfilling responsibilities to the local community.

## The scheme in action

**“How much time will I need to commit to the scheme?”**

- Up to an hour, once a week.
- Usually during the school lunchtime. However, other times can also be suitable.
- One term (12 weeks) commitment – in the first instance.

**“How are the pupils selected?”**

Schools choose which pupils to target. These may be pupils who:

- Are not confident at contributing in class.
- Have difficulty in working with others – especially at turn taking.
- Require additional time and support to develop their numeracy skills.
- Are particularly confident in maths and need time to stretch their knowledge and understanding.

**“What happens in a typical visit to a school?”**

### A typical Number Partners session in school

“I usually arrive at the school five or ten minutes before my session starts, so I can have a quick chat with the teacher and catch up on what’s been going on with my kids. Pamela and Abdul collect me from the main corridor and we go along to the library with the other Number Partners. It usually takes a while to get them going, so we have a chat about what they’ve been doing in class in the past week. Then we choose a game which we play together for about 20 minutes. I try to get them to tell me how they arrive at their answers, and they’re sometimes not very confident, but now that I’ve been working with them for three months, they’re getting better. At the end of the session, we fill in the diaries which I leave for their teacher, before heading back to the office.”

*A current volunteer*

**What do I need to find out on my initial visit to the school?**

## Being prepared

(See Appendix 1 for a checklist to take into the school on your initial visit).

**You will need to find out:**

- How and where to enter the building.
- Where to report to and sign in;
- Where key facilities are – toilets, staff room, fire exits;
- Where to meet your Number Partners;
- Where the session will take place;
- Where the pupils’ logbooks are kept.

**In addition, you will need to find out about:**

- Dress code (it is important to accord with the dress code for the teaching staff in your school);
- Name systems – find out how the school would prefer you to be addressed, i.e. by first name or last name and title;
- How the pupils are used to working in class (for example, if pupils are not used to talking in class, they may take some time to get used to the idea of explaining their number strategies);
- Behaviour rules – e.g., going to the toilet, eating, getting a drink, dealing with disruptive behaviour (behaviour is nonetheless not usually a problem in the Number Partners context);
- The names of the pupils you will be supporting. It is useful to see this written down. Check pronunciation of names you are unfamiliar with.

Key Stage	Years	Ages
<b>Primary schools:</b>		
1	1, 2	5–7
2	3, 4, 5, 6	7–11
<b>Secondary schools:</b>		
3	7, 8, 9	11–14
4	10, 11	15–16

# Section 2 Number strategies

## Mental maths

Number Partners is about developing **mental maths**. Teachers help young people develop standard written methods for adding, subtracting, multiplying and dividing, so the Number Partners volunteer should not worry about this. What young people need most of all is practice and confidence working number problems out **in their heads**. The volunteer's task is to create and sustain conversations about numbers. The games will create most of the number problems anyway. Feel free to develop the problems in the game and make them harder (or easier).

### However, don't let it end up as a test!

The volunteer keeps the conversation going by always asking:

#### “How did you do that?”

Young people will give you intriguing and unexpected answers. Never suggest a different method if their method works! The opportunity to explain a method is the route by which learners translate number strategies into algebra. If the young person is stuck, prompt them to try some useful number strategies which are taught in schools. These strategies and the questions to ask are in the following section.



### Why mental maths?

- Maths is about thinking problems through. Young people need opportunities to develop their maths thinking skills.
- Often it is helpful to write things down to keep track of a process. However, the maths takes place in your head.
- Pupils learn lots of mental methods of calculating; they need opportunities to practice them.
- Efficient mental methods make working things out much quicker and easier than written methods.
- Talking about maths helps pupils to make sense of what they are doing and to develop their understanding of maths and numbers.

### Key methods for supporting mental numeracy

- Make sure the young people work things out in their heads – never use a standard written method.
- Young people can use paper to jot down key numbers or parts of the calculation to support their thinking (but only if they need to).
- Young people can use a *number line* to support their thinking. There are examples on the next page.
- Young people should be encouraged and supported to explain their thinking out loud.
- Support young people to use a strategy that makes use of their existing knowledge.

## Glossary

There are many special words for number strategies. Don't worry about them as school pupils know them well!

**Partitioning:** breaking a number into parts to support mental calculation. E.g. 24 partitions into 20 and 4.

**Jotting:** jotting something down to keep the thinking on track.

**Number line:** nothing more than a line with numbers on it!

### Inverse operations:

● + and -  
●  $\times$  and  $\div$   
are useful pairs of inverse operations.

**Addition and subtraction facts:** pupils should know all the + and - calculations up to 20 e.g.  $14 + ? = 20$   
Answer 6. Extend to higher numbers e.g.  $35 + ? = 50$  Answer 15.

## Developing number strategies

Here are some different strategies that young people (and adults!) use in solving number problems. These are the same strategies being taught in schools.

### ● $148 + 148 [= 296]$

Rounding up to nearest 10s  
 $148 + 148$  is  $150 + 150 - 4$

### ● $79 + 52 [= 131]$

You can partition:

$$70 + 50 = 120$$

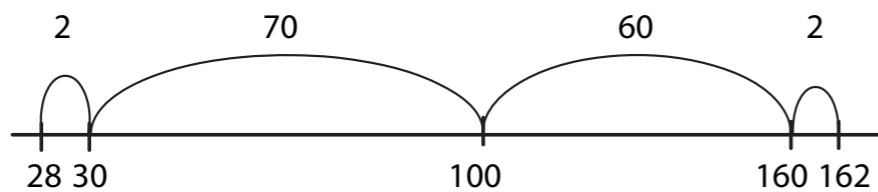
$$9 + 2 = 11$$

$$120 + 11 = 131$$

Or round to the nearest 10:

$$79 + 52 = 80 + 52 - 1 = 132 - 1 = 131$$

### ● $162 - 28 [= 134]$



Use a number line and count up to find the difference.

Start at 28: add 2 then 70 (getting to 100 is easier) then add 60, then add 2

Many people find counting up a useful way of taking away. ("How much do I have to add on to get my target?")

### ● $8 \times 7 [= 56]$

Pupils do learn their multiplication facts. But they can use the strategies to help them if they get stuck.

### ● $224 \div 4 [= 56]$

Doubling/halving (pupils practice doubling and halving different numbers)

Half 224 to make 112, then halve it again to get 56.

### Here are two ways to do $8 \times 7$ :

- 7 double (14), double (28), double (56)
- Start from a known fact e.g.  $7 \times 7 = 49$ , add one more 7 = 56

Amazingly, most people remember that  $7 \times 8$  is 56 and they remember that  $7 \times 8$  is the same as  $8 \times 7$ .

Often a number problem (adding or multiplying only!) is easier the other way round.

## Additional strategies for Secondary school students (11-14)

### Fractions and Percentages

$$\frac{3}{4} \text{ of } 32$$

$\frac{1}{4}$  of 32 is 8 so  $\frac{3}{4}$  must be  $3 \times 8$ , that's **24**.

Or ...it's  $32 \div 4 \times 3$  which is  $8 \times 3$ , which is **24**.

$$35\% \text{ of } 80$$

10% of 80 is  $\frac{1}{10}$  of 80, which is 8.

So, 30% is  $3 \times 8$  which is 24.

5% is  $\frac{1}{2}$  of 8 which is 4.

So, 35 % is  $24 + 4 = 28$ .

### Power and Roots

"Three squared"

$$3^2 = 3 \times 3 = 9$$

"Five cubed"

$$5^3 = 5 \times 5 \times 5 = 25 \times 5 = 125$$

"Two to the power five"

$$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 4 \times 4 \times 2 = 16 \times 2 = 32$$

"The square root of 16"

$$\sqrt{16} = 4 \text{ because } 4^2 = 4 \times 4 = 16$$

"The cube root of 8"

$$\sqrt[3]{8} = 2 \text{ because } 2^3 = 2 \times 2 \times 2 = 4 \times 2 = 8$$

### Factors, multiples and primes

- **Multiples** are numbers multiplied by a given number.

For example: The multiples of 7 are  $1 \times 7 = 7$

$$2 \times 7 = 14$$

$$3 \times 7 = 21$$

$$4 \times 7 = 28, \dots \text{etc.}$$

The multiples of 7 are **7, 14, 21, 28 ...**

- **Factors** are numbers which divide exactly into a given number.

For example: I can divide 15 exactly by 5.  $15 \div 5 = 3$   
 I can divide 15 exactly by 3.  $15 \div 3 = 5$   
 I can divide 15 exactly by 15.  $15 \div 15 = 1$   
 I can divide 15 exactly by 1.  $15 \div 1 = 15$

So, the factors of **15** are **1, 3, 5** and **15**.

- **Prime Numbers** are numbers which have two different factors: themselves and one.

For example: 13 is a prime number.

The only numbers which I can divide 13 exactly by are **13** ( $13 \div 13 = 1$ ) and **1** ( $13 \div 1 = 13$ ).

It is important to know that 1 is **not** a prime number, because it does not have two **different** factors.

The first few prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23,...

## Asking questions

**This is the most important thing that you will do as a number partner!**

- Ask students to explain how they got to an answer.
- If a young person is stuck with a number problem, prompt them with a question to **keep the process going**. If the first prompt doesn't work, don't explain it, try another one. It is important to find out what the young person knows.
- Often silence is best! If a young person doesn't answer, it may be because they are thinking the problem through. Always leave them enough space to do this.
- Ask the others: *did anyone do it a different way?* Ask this even when young people have got the answer right. Sharing and comparing is great for developing new strategies.

**REMEMBER** always say: **"Tell me how you did that."**

Question to ask	Use when ...
"Can you see numbers close to these that would be easier to deal with?"	the problem involves numbers like 38 or 19 or 185. (Use 40 or 20 or 200).
"Could you break it up and work on the bits separately?"	part of the problem is easy to. E.g. $135 \div 5$ . Do $100 \div 5$ , that's 20 and $35 \div 5$ that's 7, answer is $20+7$ , 27.
"Could you use doubles or halves?"	you need to multiply (or divide) by 2 or 4 or even 8 or 16!
"Would it be easier the other way round?"	starting close to the answer makes it easier. E.g. to do $25+138$ turn it round and do $138+25$ ... much easier!
"Would it help to jot down a number half way?"	someone gets that glazed look and grinds to a halt! Jotting the number down keeps the process going.
"Would it help to use a number line?"	the pupils are having trouble getting started. Young people will use the line to organise the process and keep it going.
"Can you see an easier problem with the same answer as this one?"	the students are really confident e.g. $79 + 82$ is the same as $80 + 81$ ...much easier!

**Which kind of questions should I be asking?**

**Closed questions:** A closed question has an answer that is either right or wrong. There is just one answer.

**Open questions:** An open question is a question that can have several different answers. The answers can all be correct, or else perfectly acceptable in the context. When you use open questions, you are encouraging pupils to think things through.

# Section 3 Number Partners sessions in schools

## Games for primary pupils

### The games

There is a range of games that you can use in your sessions with the pupils. These will be made available through your business or broker.

### Primary schools

Number Partners developed a set of Number Challenge board games in partnership with BEAM Education. There is now a second set of Number Challenge games which deal with different number concepts. These are most suitable for pupils aged 7–9.



In addition, volunteers can now access for boxes of games for 5–7 and for 7–11 year old pupils. These are produced by the national Number Partners office and, together with the BEAM games, are available through your broker or from [www.numberpartners.org](http://www.numberpartners.org).

This handbook also contains examples of many other games that can be used during your sessions and website addresses where you will be able to find similar games.

There are many other commercially produced games that would be useful, such as the '24 Game' available from Education Interactive.

Our volunteers are fantastic! They are business-like, approachable and reliable. They are a breath of fresh air every Tuesday pm.  
Headteacher

## Playing the games

### How do I get the games started?

#### You might consider strategies such as...

- The one with a birthday this month
- The most attentive and ready

You have probably used many other strategies yourself. Agree rules before you start, such as 'play goes clockwise'.

### How long do the games last?

- They usually last between 10 and 20 minutes.
- The game will end sooner than this if players don't think through the strategies of the game. Also, you should always be asking: "How did you do that?"
- Encourage pupils to think about playing the game strategically, using their number skills.

### Some issues to consider

#### What if a pupil needs help?

- Use the rules booklet for suggestions for things to say to pupils, and questions to ask.
- Don't forget that the games are designed to be challenging, so pupils are motivated to work out the solutions.
- Many of the game boards include information, such as lists of halves and doubles, multiplication facts, or a number line. These are helpful to prompt and support pupils. However, they can be covered up when no longer needed.





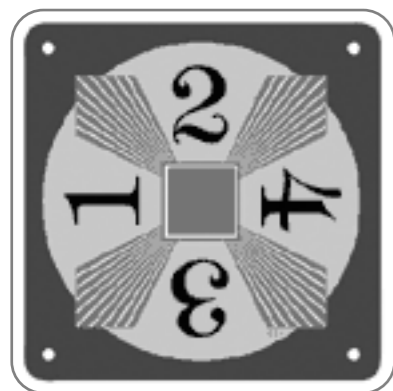
## Games for lower secondary students ages 11–14

Number Partners has produced a box of games for use in secondary schools. These are available through your Number Partners broker or from [www.numberpartners.org](http://www.numberpartners.org).

The majority of these games involve basic arithmetic. However, unlike the primary games, the number problems will be much more varied and larger numbers will be involved. Some of the games also include the additional strategies we looked at earlier.

### Examples of some of the games in the secondary games 3 box

#### The 24 Game



This is a card game. Players compete to solve the puzzle on a card to claim it. The aim is to combine the four numbers on the card to make 24. You must use all of the numbers once each and you can add, subtract, multiply or divide.

#### The solution to this card is:

$2 \times 3$  makes 6. Then  $4 \times 1$  makes 4. Finally  $6 \times 4$  makes 24.

Players will quickly start to get better at finding useful combinations out of pairs of the number to get closer to the solution. For example, getting 23 using two of the numbers means you just need to make 1 out of the other two.

Equally, if I can make 8 with two of the number, then I need 3 with the other two, so I get  $8 \times 3 = 24$ .

#### Nubble

In this board game, players compete to make different numbers using the 4 numbers rolled with 4 dice. They claim the number by placing a counter on it.

You can make any number from 1 to 100. There are more points for larger numbers. However, there are bonus points for making sets of 3 counters in a triangle. Also, players must build a chain across the board to finish the game. Hence, it is important to develop strategies to find numbers of different sizes.

*Here are some examples:*

I roll **2, 2, 5** and **6**.

I can make:  $2 \times 5 = 10$  then  $\times 2 = 20$  then  $+ 6 = 26$

Or:  $5 - 2 = 3$  then  $3 \times 2 = 6$  then  $6 \times 6 = 36$

Or:  $6 \times 5 = 30$  then  $30 \times 2 = 60$  then  $60 + 2 = 62$

## Financial literacy games for upper secondary students ages 14–16

### Getting started activity

Share your anecdotes:

- Where I made a good financial decision and how that came about.
- Where I made a poor financial decision and how I could have avoided it.

### The Purpose of the Games

Young people need support in making financial decisions in an increasingly complex and highly competitive world. Good financial decisions support security and prosperity. Poor financial decisions can lead to debt, insecurity, trouble with the law, homelessness ... The purpose of the games is to help young people understand how to make good financial decisions, by placing them in a realistic scenario where the effect of their decisions can (safely) be seen.

The rules booklet with each of the games has a detailed summary of the purpose of the game. It is useful to be familiar with it. However, the messages of financial planning, prudence and security come out of playing the games. The winner should always be the player who has made the best financial decisions. Share your concerns and thoughts with students as the game progresses e.g. "Are you sure you want to keep so much of your money in cash?" or "Which sets are you collecting? Have you seen how much they'll be worth?"



<b>The Savings Game</b>	To compare security and flexibility between using cash and a bank account. Using a savings account as a clear way of assigning money to a purpose and seeing the returns on interest as the savings grow.
<b>Web Wheeler Dealer</b>	Developing a basic business sense in affordable speculation. Making sensible choices in what to buy and sell to maximise profits.
<b>On Budget</b>	Keeping a sense of future needs and planning and spending accordingly. Structuring spending over the medium term.
<b>Invest!</b>	Choosing investment opportunities according to their likely return, based on a knowledge of market trends. Balancing risk and return.



### Tips for playing the Financial Literacy games

- The rules are necessarily complicated. Read through them together carefully. You may need to gloss over some details the first time you play. If you find anything you cannot understand or a situation where you do not know what to do, make a local agreement and stick with it. Develop your understanding of the games over time.
- Keep control of the components – make sure players take reasonable care of them. Take them out and pack them away with care.
- A complete game should run over two sessions (say 2 × 1/2 an hour). Check the rules for how to keep the game position for the second session. (You will need some envelopes).
- Play the games more than once. Successive sessions will develop strategies and deeper understanding of the key financial ideas.

**REMEMBER All sophisticated board games take a little while to work out.**

**Expect at least 10 minutes of uncertainty, confusion and frustration. Keep going, keep talking and start playing.**

## Specific issues for working with secondary school students

- Naming conventions. Using your first name helps to break down the expected teacher/student relationship. This will help you avoid being seen as the teacher. Check that the school is okay with this.
- Students will generate conversation away from the game – they are very likely to be really interested in you. This is reasonable and shouldn't be discouraged. However, beware of becoming too personal. Keep topics of conversation away from areas that you feel uncomfortable about. Simply say, "That's not what we're here for!" and get quickly back to the game.
- Keep everyone involved at all times as far as you can. If someone is not doing something, ask them a question about the game or ask their opinion about their strategy.
- Always keep the language within bounds. Don't allow yourself to slip into the vernacular! Students should never use swear words or say anything offensive to or about anyone. They can easily lapse into this when the situation feels informal. All you need to do is say, "That's not appropriate", look serious for a brief moment and then quickly get back to the game.
- Organisational rules will apply to the session. Generally no food, no wandering off, etc. You should explain that these are school rules, say "I'm really sorry, I've been told that I mustn't let you ..."
- Older students are very aware of becoming young adults. Use words which recognise this.

Don't Say	Do Say
Girl/Boy	Young person or young man/woman
Pupil	Student

- Avoid working with friendship groups. Mixed groups of students who know each other less well are always best. Established groups bring an external dynamic which can sometimes be tricky to keep in control.

**DON'T FORGET you are not the teacher. If something happens that you feel uncomfortable about and you cannot deal with it simply in a friendly way, then go to the teacher and ask them to help. That's always fine!**

# Section 4 Beyond the games

## Record keeping

### What record keeping should I be doing?

- Some people like to keep a record of the games that they have played.
- Note down any interesting things that happened.
- Record anything a student does for the first time or has newly mastered.
- It is particularly helpful for the students to see their efforts recorded.

### Number Partners diary

You will be given a Number Partners diary. This is an informal document, in which you can record the games you have played. There are spaces to record key events in the session. Students can write their own comments and you can keep track of any changes that happen.

Use 2 or 3 minutes at the end of each session to summarise what has been done. This can be done through asking the pupils:

- What they enjoyed best today.
- What did they find easiest.
- What made them think the most.
- What they practised today.

### Number Partners Evaluation

All participants in the scheme are asked to fill in a questionnaire as part of the evaluation process. Comments are valued and form part of the development of the scheme. The results of the evaluations are kept as reports and are available on the Number Partners web site [www.numberpartners.org](http://www.numberpartners.org).

## Working with young people: issues to consider

As a Number Partner, we know you share our concerns for the welfare of pupils in schools. Number Partners who adhere to the expectations below are much more likely to have a positive experience in their school, with staff and pupils looking forward to each session.

- All volunteers are expected to deal with one another, school staff and pupils in a courteous and polite manner.
- In the event of absence, late arrival or change of session times, it is important for all concerned to inform the coordinator and the school.
- Any exchange of gifts or presents (e.g. birthday, Eid, Christmas or leaving) must be agreed with the Headteacher or school coordinator at the beginning of the scheme.
- If a volunteer wishes to leave the scheme, they should give at least one month's notice to the coordinators, as well as letting the pupils know about their imminent departure.
- Volunteers will be required to complete a short evaluation, which will include an assessment of the scheme. These records are used to measure the effectiveness of the partnership at a local and national level.

As a Number Partners volunteer, you are already checked by the Criminal Records Bureau and are working in a room with other students and volunteers. This makes it a secure and trouble free environment.

**However, there are 3 important things to be clear about:**

- Volunteers will treat any information that they receive regarding pupils or the school as CONFIDENTIAL. Students will sometimes tell you things from their home life which you may recognise as sensitive. You must not promise to keep anything a secret. Instead you should encourage the student to take this information to their teacher/form tutor or the designated Child Protection officer in the school. In addition, you must tell a member of staff from the school on the day of the disclosure. It is always better that a student does not disclose information to a volunteer.
- All volunteers must comply with the school's Equal Opportunities Policy. Volunteers must not discriminate against other volunteers, pupils or school staff on the basis of their age, race, culture, religion, caste, disability, gender or sexuality.
- Volunteers need to protect their professional integrity in every practicable way and must never be left alone in a room with a pupil or group of pupils. There must be at least one other adult present in the room at all times. In addition, volunteers should not touch young people in any way. It may be quite appropriate in other settings and be very reasonable, but in a school setting this should be avoided.

## Top Tips for being a successful volunteer

**Ask questions**

Ask lots of open questions. "How did you do that?" "Would it help to break it down a little" etc. Encourage students to keep going with their thinking.

**Be positive**

The pupils being supported may not be used to success in maths and may find it a bit of a struggle. The games are their opportunity to try things out in a safe environment. It doesn't matter if they get things wrong. You have time to talk things through. The games provide the opportunity for building self-esteem and developing positive attitudes to learning.

**Give lots of praise**

We all enjoy and thrive on praise. Give lots to the pupils. This will help to develop their confidence and motivation. They will begin to feel more positive about themselves and their abilities in maths. This will have a knock-on effect on other areas of learning for them.

**Set guidelines**

Children like to know the rules and boundaries. Be consistent, fair, funny, helpful, at times firm (children respond well to a sense of security and a sense of humour from an adult).

**Be interested**

Children love to talk and may not get as much opportunity as they would like to do this in class. You may find that you are spending the first 5 minutes or so listening to them tell you about things that have happened. This is not time wasting. It is part of their building up a relationship with you.

**Have fun**

Numeracy and maths can be fun and this time should be enjoyable for all of you. Pupils will respond well to your enthusiasm. The session should be relaxed.

**We wish you well with your Number Partners volunteering!**

## Appendix 1: The initial visit checklist

Use this to record important information about the school, its systems and the pupils.

School	Session day / time
How and where to enter the building.	
Where to report to and sign in.	
Where key facilities are – toilets, staff room, fire exits.	
Where to meet your Number Partners.	
Where the session will take place.	
Where the games and pupils' diaries are kept.	
Dress code (it is important to accord with the dress code for the teaching staff in your school).	
Name systems – find out how the school would prefer you to be addressed, e.g. by first name or last name and title.	
How the pupils are used to working in class (for example, if pupils are not used to talking in class, they may take some time to get used to the idea of explaining their number strategies).	
Behaviour rules – e.g., going to the toilet, eating, getting a drink, dealing with disruptive behaviour	
The names of the pupils you will be supporting. It is useful to see this written down. Check pronunciation of names you are unfamiliar with.	

## Appendix 2: extra resources

### The Number Partners web site

**www.numberpartners.co.uk** up-to-date news and information about the Number Partners scheme. The resources section has a downloadable 12 page booklet of extra games to play with easy to make equipment.

### Suppliers of Games and Puzzles

**www.education-interactive.co.uk** for maths games and puzzles ideally suited to Number Partners sessions, notably including the 24 Game and the Number Partners games boxes.

**www.beam.co.uk** the makers of the original Number Partners number challenge games. They have a wide range of other games and activities.

**www.math24.com** the US makers of the 24 Game. Practise on-line and play the card game in Number Partners sessions.

**www.smilemathematics.co.uk** for nice books and puzzle type games.

**www.ATM.org.uk** the association of teachers of mathematics or ATM games and books.

**www.happypuzzle.co.uk** contains a good selection of games and puzzles many including numeracy.

### On-line activities for games ideas

**www.counton.org** contains a good range of fun maths games.

**www.mazeworks.com** contains on-line versions of traditional games and puzzles.

### Recommended Books of Games and Puzzles

● *Calculations In Their Hands* by Fran Mosley

● *Cards On The Table* by Fran Mosley

● *Casting The Dice* by Fran Mosley

● *Numbers In Your Head* by John Spooner

All books published by BEAM ([www.beam.co.uk](http://www.beam.co.uk))

● *Eight Days a Week: Puzzles, Problems and Questions to activate the mind.* Published by the ATM ([www.atm.org.uk](http://www.atm.org.uk))

## Appendix 3: Additional games

Use these when you need a change or you have a little time to fill. All of the games are suitable for all ages. With number games make the numbers smaller or larger according to age.

### Paper, pencil and spoken number games

**1. Fizz Buzz** Players take turns to see how far they can count up. However any multiple of 3 is buzz. Any multiple of 7 is fizz. Any multiple of both is fizz buzz. The winner gets the furthest.

Its starts like this: "1, 2, buzz, 4, 5, buzz, fizz, 8, buzz, 10, 11, buzz, 13, fizz, buzz, 16, 17, buzz, 19, 20, fizzbuzz, 22, ..." (Added spice for later: multiples of 5 are wizz).

**2. Fifty Up** Two players take turns to add a number between 1 and 9 to the total. The first player to say 50 wins. For example: first player starts and says "7", second player adds 9 and says "16", first player adds 8 and says "24", second players says "33", first player says "40", second players says "42", first player says "50" and wins the round! Variation: play to 20 adding only 1, 2 or 3.

**3. Twenty Questions** Players take turns to think of a number. The other players can ask questions in turn, but the answer will only be "yes" or "no". Players have 20 questions to find the number. As players get more experienced they can try more and more unusual numbers!

**4. Target Number** Take turns to write down a target number, put a circle round it, then write down 4 smaller numbers. All players have one minute to use the 4 different smaller numbers to make a number as close as possible to the target number. The numbers can be added, subtracted, multiplied or divided, but you must use all 4 numbers. In each round there are 5 points for the closest and ten points to anyone who can make the target number exactly. Use different rules for different levels, for example:

Level	Target number between	Other numbers between
1	11 and 20	5 and 9
2	11 and 20	3 and 5 3
3	1 and 50	5 and 9
4	51 and 100	3 and 6
5	101 and 200	11 and 20

### Games with a 10 sided Dice

All of these games are suitable for primary school Number Partners. They can also be used as starting points in secondary schools.

The free Number Partners game Power Up comes with a dice marked from 1 up to 10. Contact the Number Partners office for more copies.

**1. Bingo** Use  $2 \times 1-10$  dice.

Each player draws a 3x3 grid and writes a different number between 2 and 20 into each square. Take it in turns to roll the dice. Each player adds the numbers together, if they have the answer on their grid they cross it out. The winner is the first player to cross out all their numbers. Encourage children to work out the answers quickly!

**2. Multiplication version** Play as above but in the grid write any multiples of the numbers 1-10. When the dice are rolled, multiply the numbers together. If children write numbers that are not multiples discuss why they will not be able to win the game.

*Make it harder or easier:* Using 1-6 dice will make the game easier and a 1-20 dice will make it harder!

**3. Make the highest number** Use a 1-10 dice. On a piece of paper write down Th H T U Take it in turns to roll the dice. You are aiming to make the highest 4-digit number. Look at the digit on the dice to decide whether to write it in the thousands, hundreds, tens or units place. Once it is written you cannot change it! When both players have filled in all four spaces, see who has written the highest number. You must be able to read your number to win.

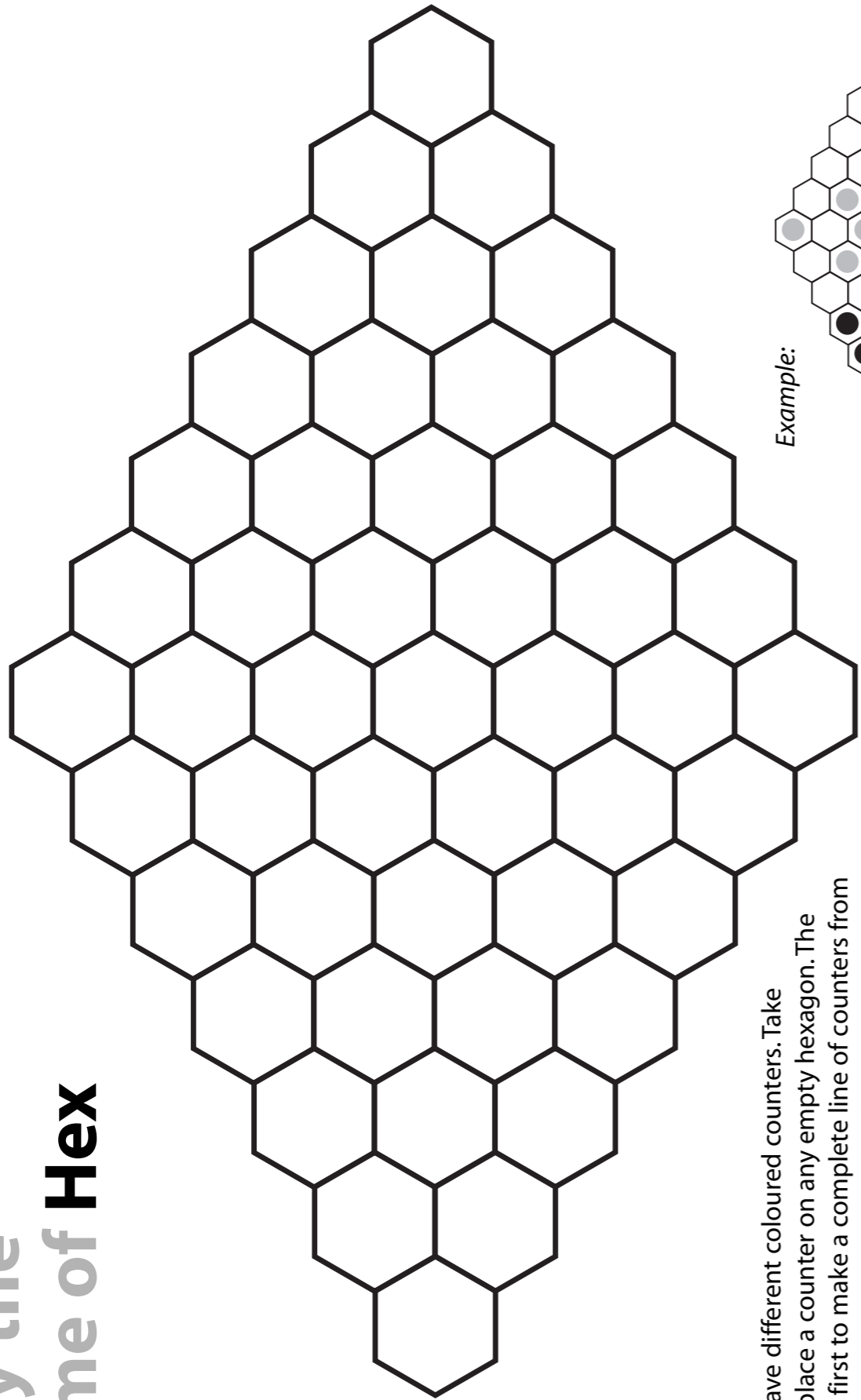
*Make it harder or easier:* Make 5 digit or 3 digit numbers.

**4. Race to the end of the line** Use a 1-10 dice. Draw an empty number line. Put 0 at one end and 100 at the other. Take it in turns to roll the dice. Add the number on your dice to your position on the number line draw a loop up to your new total and write the number. The winner is the first person to get past 100.

*Make it harder or easier:* You can change the game by putting different starting and finishing numbers on the number line or count each digit on the dice as a multiple of 10 and jump on it multiples of 10.

In all of the games volunteers should feel free to modify and extend the rules. Also, ask extra questions such as; "Do you know the number that is 1 more, 10 more or 100 more than your number?"

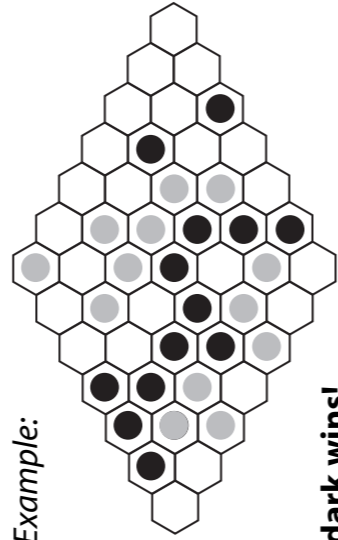
# Play the game of Hex



Players have different coloured counters. Take turns to place a counter on any empty hexagon. The winner is first to make a complete line of counters from one side to the opposite side. The player who starts must not use the centre hexagon. They make their line from the bottom left side to the top right side. The other player makes their line from top right to bottom left.

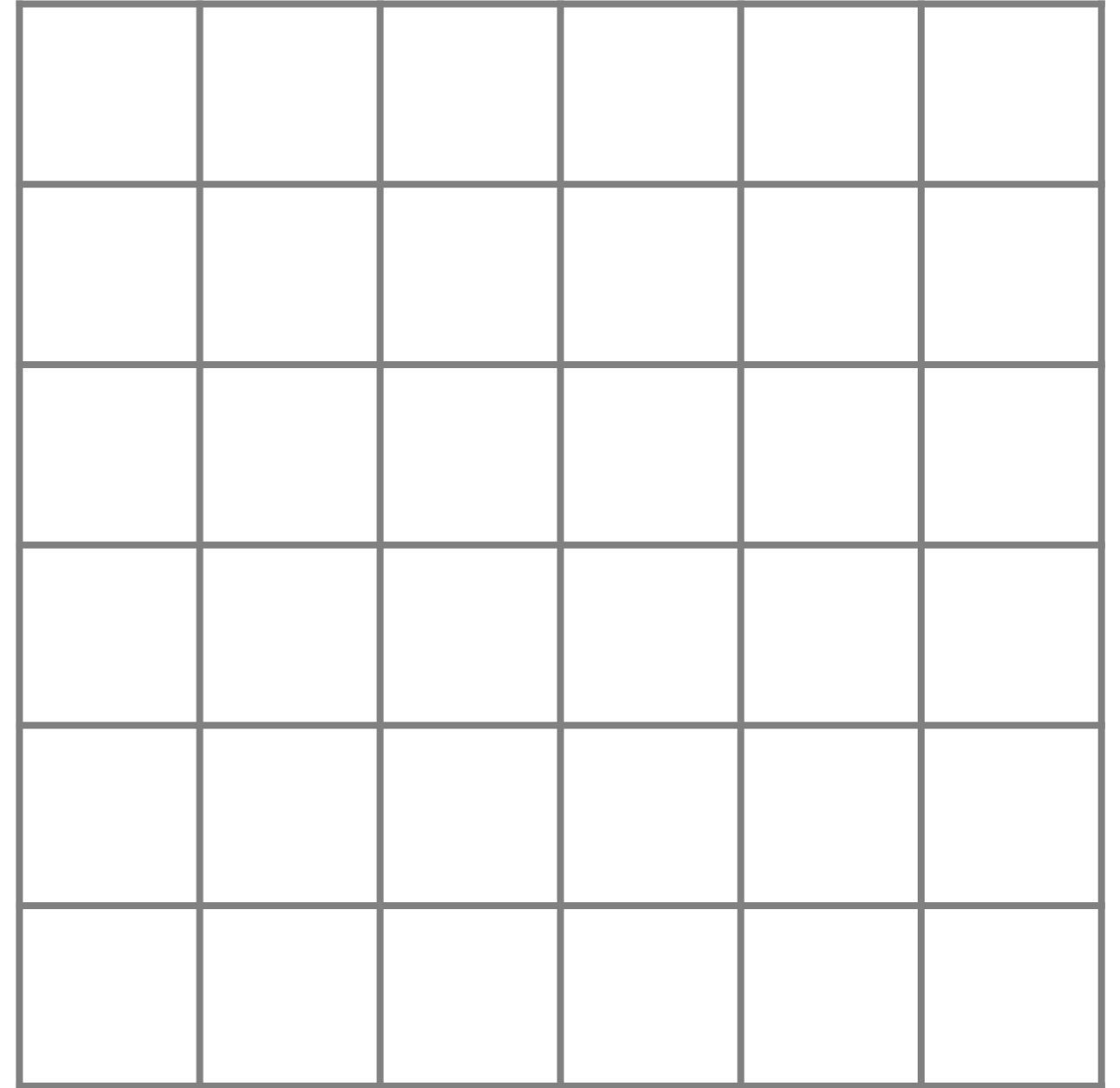
An A4 board is available to download at [www.numberpartners.org](http://www.numberpartners.org)

Example:

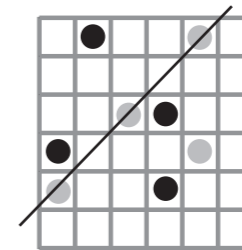


dark wins!

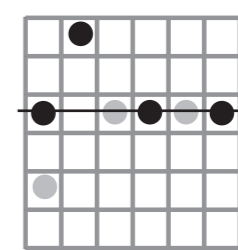
## Triplets



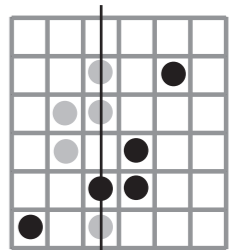
Players have different coloured counters. Take turns to place a counter on the board. The winner is first to make a line of three counters. The line can be vertical, horizontal or diagonal. *For example:*



light wins



dark wins



light wins

# Notes

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Deringer, HSBC, KPMG LLP (UK), The Moody's Foundation, Tower Hamlets Education  
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