# Making the most of Numbershark

## Tips on 'tables' topics and on fractions

### Tables topics

Multiplication tables go up to 10 or to 12.

Under Also there is a choice of which way round to present each table e.g. 1x7 or 7x1

To practise a table in order, select the order button. De-select the button when you want to mix it up.

| 1 x 7 table | | | |
|---|---|---|---|
| 1 | × 7 | = | 7 |
| 2 | × 7 | = | 14 |
| 3 | × 7 | = | 21 |
| 4 | × 7 | = | 28 |
| 5 | × 7 | = | 35 |
| 6 | × 7 | = | 42 |
| 7 | × 7 | = | 49 |
| 8 | × 7 | = | 56 |
| 9 | × 7 | = | 63 |
| 10 | × 7 | = | 70 |

| 7 x 1 table | | | |
|---|---|---|---|
| 7 | × 1 | = | 7 |
| 7 | × 2 | = | 14 |
| 7 | × 3 | = | 21 |
| 7 | × 4 | = | 28 |
| 7 | × 5 | = | 35 |
| 7 | × 6 | = | 42 |
| 7 | × 7 | = | 49 |
| 7 | × 8 | = | 56 |
| 7 | × 9 | = | 63 |
| 7 | × 10 | = | 70 |

There is a structured sequence of topics to ease the learning of tables for those who find it difficult.

Tables in order
- Tables to 10 in order
- Tables to 12 in order
- Tables linked by doubling
- More challenging tables questions
- A structured course for learning tables to 10
  - Easy multiplication tables
    - 1 x 10 table
    - First half of 5 times table
    - 1 x 5 table
    - First half of 2 times table
    - 1 x 2 table
    - Revise 2, 5 and 10 times tables
  - Harder multiplication tables
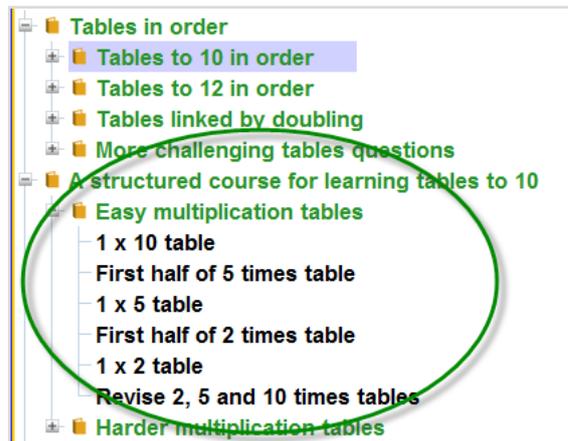
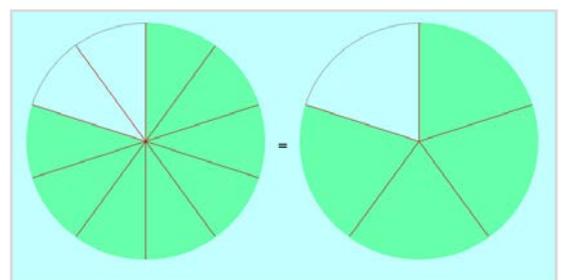### Fractions topics

The fractions topics are finely graded and seek to include the underlying concepts.
*Recommended games* are useful.

Fractions
- Recognition and equivalence
  - Recognition
  - Equivalence
  - Improper fractions & Mixed numbers
- Counting and ordering fractions
- Addition and subtraction
  - Making up wholes
  - Adding & subtracting - same denominator
  - Adding & subtracting - different denominators
  - Adding & subtracting - with mixed numbers
- Multiplication and division
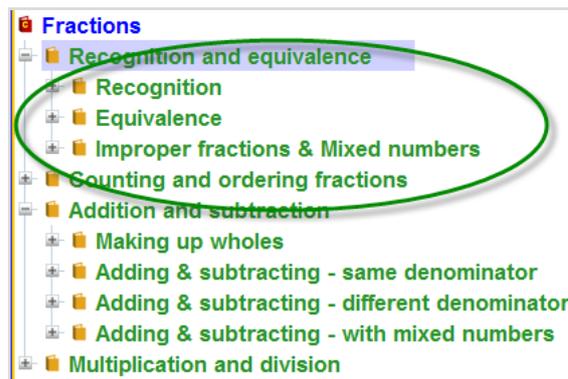
Click on examples for demos.

$$\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$$

Demo of 8/10 = 4/5

Click on the spanner (and again for the default) if you wish to experiment with different ways in which fractions can be displayed.

You also have a choice of *denominators*.

The game *Match* will be a good way to see the changes.

The changes will not be saved when you leave the topic/log out.

Bear in mind some choices will work better than others.

# FOR SCHOOLS – educational tips

## Learning concepts

Learning number bonds, tables and formal
written methods need a sound conceptual
base. Below are some suggestions.

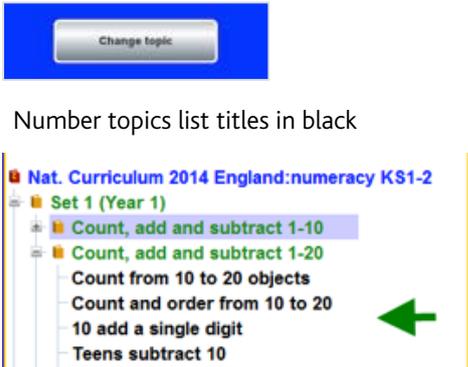| Practice and understanding in: | Topics & Games |
|---|---|
| **100 square** | **Topics:** Section under *Special topics – Easy adds or subtracts in the 100 square* also topics for tables<br>**Games:** *Sum demo*, *Match sum* with *10x10 grid* games option ticked, *Treasure*, *Grid* |
| **Adding 9**<br>(Round to 10 then adjust<br>+10 -1) | **Topics:** Topics under heading *Special topics\Rounding and adjustment* (adding 10 has to be secure first however)<br>**Games:** *Crocodiles*, *Numberline*, *Safe cracker* |
| **Bonds of 10** | **Topics:** *PAIRS of numbers that TOTAL 10*<br>**Games:** Those under the 'Recommended games' tab<br>*Grab coins* – with game option to *Collect coins to make up 10*<br>*Fill gaps* also shows the relative size of the numbers involve*d* |
| **Bridging through 10s boundaries**<br>(Making mental addition and subtraction easier eg 26+7 could be 26+4=30 then 30+3=33) | **Topics:** Any topic with *carrying* or *exchanging* in its title – type 'carrying' or 'exchanging' into *Search*<br>**Games:** *Crocodiles* |
| **'Carrying' in addition** | **Topics:** Any topic with *carrying* in the title – type 'carrying' into *Search* in the menu<br>**Games:** *Formal sums, Calc rods, 3 or more, recommended games, Grab coins* |
| **Conservation**<br>(The number of objects doesn't change even if rearranged) | **Topics:** *Addition with answers up to 5, to 10, to 20, to 100*<br>**Games:** *Conserve* |
| **Counting**<br>(In 2s 3s etc) | **Topics:** The section of topics under *Counting and Sequencing*<br>**Games:** Under the *Counting & ordering* tab |
| **Counting on, counting back, seeing a small difference** | **Topics:** *Finding a small difference (by counting on), TU*<br>*Taking off a small amount, TU*<br>*Finding a small difference (by counting on), HTU*<br>*HTU – Units (counting back)*<br>**Games:** *Grid, Numberline* |
| **Decimals**<br>The concept | **Topics:** The sections under headings for *Recognition*<br>**Games:** Those under the 'Recommended games' tab |
| **Fractions**<br>The concept | **Demo:** Bring the topic on screen and click on any of the samples in the right hand panel for a demo, then use the recommended games |
| **Fractions**<br>Equivalence | **Topics:** Those under headings for *Recognition and equivalence* with 'Equivalent' in their title<br>**Demo:** Bring the topic on screen and click on any of the samples in the right hand panel for a demo, then use the recommended games |

| Practice and understanding in: | Topics & Games |
|---|---|
| **Linking new facts with old** | **Topics:** Any topic with *Link* in the title – type 'link' into *Search* in the menu<br>**Games:** *Sharks, Maze, Salvage, Fill gaps* |
| **Long division**<br>(When concept is understood) | **Topics:** Topics under the headings *Single-digit division* and<br>*Two-digit and three-digit division*<br>**Games:** *Formal sums* |
| **Maths vocabulary for + – x ÷** | **Topics:** All topics in each operation suitable for mental arithmetic<br>**Games:** *Pick listen, Numberline*<br>Also the *Worded problems – Arithmetic with Quiz, Greening* |
| **Missing numbers** | **Topics:** Ones with *Missing numbers* in the title – type 'missing' into *Search* in the menu<br>**Games:** Those under the 'Recommended games' tab |
| **Partition**<br>Method of adding /multiplying eg 256 stands for 200+50+6 | **Topics:** Topics for adding or multiplying up to 3 digits<br>**Games:** *Partition*<br>*Calc rods* |
| **Place value**<br>(eg in the number 62 the 6 digit stands for 60 and the 2 for 2 units) | **Topics:** *Easy adds to 100* with the topics in the drop-down 'Also' menu<br>*Adding 1or 10 answers to 100*<br>*Adding 1, 10, 100 answers to 1000*<br>*Easy adds and subtracts in the 100 square* with the 'Also' menu<br>*Easy addition and subtraction facts to 1000* with the 'Also' menu<br>Decimal topics under *Recognition*<br>**Games:** *Match, Calc rods, Which, Fit in, Pick*<br>*Number build* – use *Options* for changing number size<br>*Safe cracker* – use *Options* for changing number size<br>*Grab coins* and *Spend coins* – both with any topic |
| **Quick recall of + and – facts** | **Topics:** Any that need quick recall<br>**Games:** Those under the 'Mental maths' tab also under 'Recommended games' and some 'Understanding and practice' |
| **Quick recall of x and ÷ facts** | **Topics:** Any that need quick recall<br>**Games:** Those under the 'Mental maths' tab and under 'Recommended games' and some 'Understanding and practice'<br>Also *Crocodiles, Count, Bombs, Rolling* |
| **Reversals**<br>(e.g.reading 81 for 18) | **Topics:** Any which involve *TU* and *HTU*<br>**Games:** *Match*<br>*Number build* (reading from left to right)<br>*Safecracker* (linking place value and digit order)<br>*Calc rods* (setting up numbers correctly)<br>*Formal sums* |
| **Rounding** | **Topics:** Ones with *Rounding* in the title – type 'rounding' into *Search* in the menu<br>Any which involve numbers above 100 (for rounding to nearest 10)<br>Any which involve numbers above 1000 (rounding to the nearest 100)<br>**Games:** *Knock down* (with the game option for rounding) |
| **Understanding division**<br>The concept | **Topics:** *Division by 2 up to Division by 10*<br>**Games:** *Surround, Numberline, Crocodiles, Sum demo, Fill gaps,*<br>*Running man, Jump, Calc rods, Grid*<br>Use *Demo options* at the bottom of the screen to tailor it to your needs |

| Practice and understanding in: | Topics & Games |
|---|---|
| **Understanding exchanging**<br>A popular method (decomposition) in subtraction – needed in vertical sums, when the bottom digit is larger than the top digit you are taking it from) | **Games:** *Grab coins* and *Spend coins* – with any topic<br> *Calc rods* and *Sum demo* – with any topic with *exchanging* in its title – use the *Search* to find them by typing in 'exchanging'<br><br>When concept is understood; *Formal sums* is useful |
| **Understanding multiplication**<br>The concept | **Topics:** *Tables topics*<br> *TU x U*<br>**Games:** *Surround, Calc rods, Crocodiles, Sum demo, Fill gaps, Running man, Jump, Snails*<br> When concept is understood; *Formal sums* is useful<br> Use *Demo options* at the bottom of the screen to tailor it to your need |

# FOR HOME – tips for use

By 'parent' we mean any responsible person who is helping a student to use *Numbershark* at home.

## Setting up – a very brief summary

**1** Make sure you are a Numbershark administrator.

(A list of administrators is available under *Users*. If a child has become the administrator and has forgotten his/her password, contact White Space support if you have problems.)

**5** Find a group of topics at the right level and work from there.

Change topic

Number topics list titles in black

Nat. Curriculum 2014 England:numeracy KS1-2
Set 1 (Year 1)
Count, add and subtract 1-10
Count, add and subtract 1-20
Count from 10 to 20 objects
Count and order from 10 to 20
10 add a single digit
Teens subtract 10

**2** Add your students/children using *Admin* in the menu by clicking on:

Add new:
Student

**6** Switch to the games screen and start with the first of the recommended games. Select Help for the instructions.

Choose game

**3** Use the *National Curriculum* **course** as a graded course if you are not sure what to choose.

**7** Move to the next topic when the current one is mastered.

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**4** Click on *Help* in the menu if you need:
• videos in the drop down menu
• instructions that come up with each game.

**10-15 minutes 2-3 times a week should be effective. Younger children may need more frequent but shorter sessions.**

## Finding the right number topics

- The blue course headings are described briefly on screen. The topics they contain are finely graded – often having different sections for mental maths and for written calculations. It may be necessary to discuss with your child's teacher a good place to start – especially if your child is experiencing difficulties.

- Try to use the recommended games in the order presented. You will probably only need to work on one or two green headings before switching to – or interweaving with – the reverse operation e.g. moving from *General addition* with answers to 10 to *General subtraction* from 10 or less.

- Alternatively , the *National Curriculum course* is a graded course that your child could work through. As a rough guide, Set 1 is for year 1 (aged -6) and so on but many children who have missed out on earlier foundations in maths could gain considerably from starting at a set maybe 2 or 3 years below their age group and catch up gradually. This applies equally to the worded problems.

- You can click on any example on the right of your screen, for most topics, for a demo.

- Fractions need a very thorough understanding of the topics under *Recognition* and *equivalence* before later topics are selected.

- Always remember to include some of the graded *Worded problems*, both *Real life* and *Arithmetic* ones. They can be read aloud if clicked on.
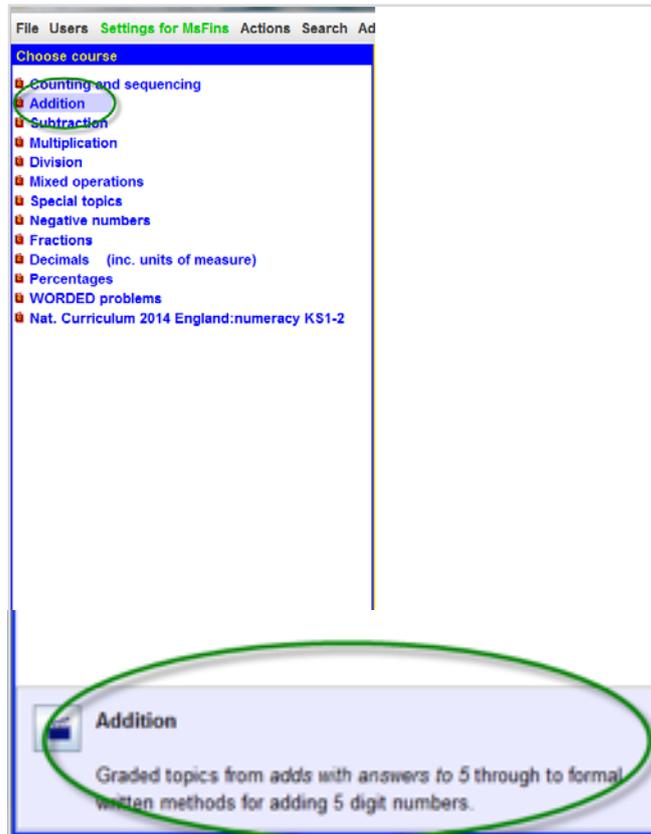
## Working through a course

- Once you have found a sensible starting point, it is important to keep up a good pace. Move to the next topic in each section when making only one or two mistakes on an activity such as *Sum test* (or *Formal sums* for the higher numbers).

- If your child comes to topics that are too easy then move on straight away. Stop if the topics suddenly get far too difficult.

- Use any teaching notes (bottom middle panel) to help with what to watch out for.
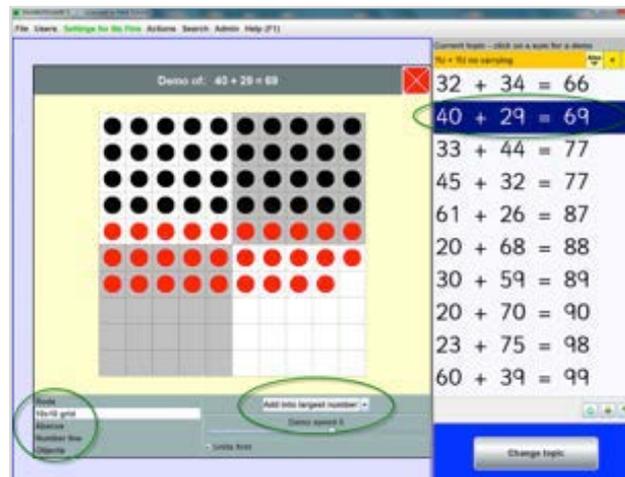
## Keeping the program interesting

A good guide is to keep sessions simple at first then add new things:
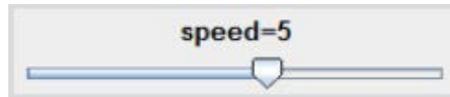
- Start with the first of the recommended games then gradually extend along the row

- Change the sprite under personal *Settings for (name)* in the menu – the sprite is 'you' in the games

- Change Options – for example change from rods to digits in the *Balance* game – an *Options* button is found top left of screen in many games
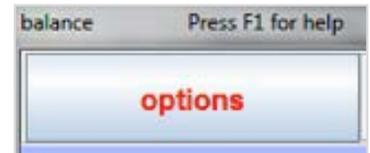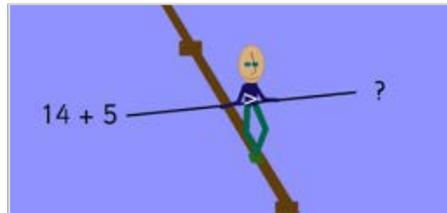
- Don't forget about adjusting the speed

- Add your own icon under personal *Settings for (name)* – for when you sign

- Change other personal *Settings for (name)* for example choosing favourite reward games

- Try *Shared play* where 2 users are signed on and take turns (see PDF 'Shared play' in this section) – particularly in games like *Bingo*. Have 2 users signed on (one could be an adult if you wish. Select *Users* in the menu and then *Share with*.
Tick the box for the person you wish to share with. You will be given alternate goes, and will share scores.
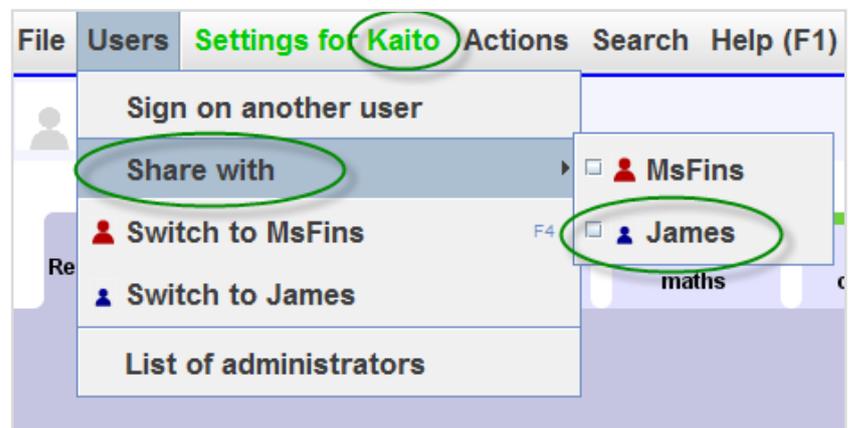
Look under the previous PDF 'Tailoring the program' if you want to get the best from the program for individuals and particular groups of children. This includes tips for use with younger children, for teenagers, for those with dysalculia, dyslexia, dyspraxia, ASD, ADHD or sensitivity to certain colour backgrounds.

It would also be very useful to read through the PDF 'FOR SCHOOLS – educational tips' in this section as this gives extra information on subjects and concepts that could benefit your child.

**If you ever need to exclude certain games,** go to *Admin\Universal settings*. Click on the *Exclude games* icon.

Choose *Games* or *Reward games* in blue on the left.
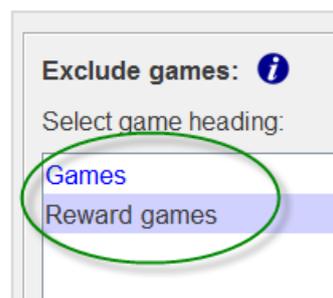
Open up the menu in the middle column and select games individually and click on the arrow. The reverse arrow can also be used to put the games back into circulation.

## Checking what your child has worked on

If you want to see a record of your child's use of the program (including any errors and any incomplete games), click on *Admin\Add and manage students and staff* then select your child's name and click on *View*. Alternatively with younger children – sit with your child from time to time and both sign on and tick to share play and play some games together e .g . Bingo – then your child can share with you what he/she has achieved.

## Maintaining progress

Keep an eye on progress. When left alone, some children could make little gains from the program because they may go back to a very simple topic, and play favourite games too much. They need to be encouraged to try a variety of games. If this becomes a real issue, you can sign on as a Numbershark administrator and explore how you can set work for your child from time to time.

Generally, a supportive and interested adult can encourage a very constructive use of the program, with a choice of topics and games which will support and yet challenge your child.
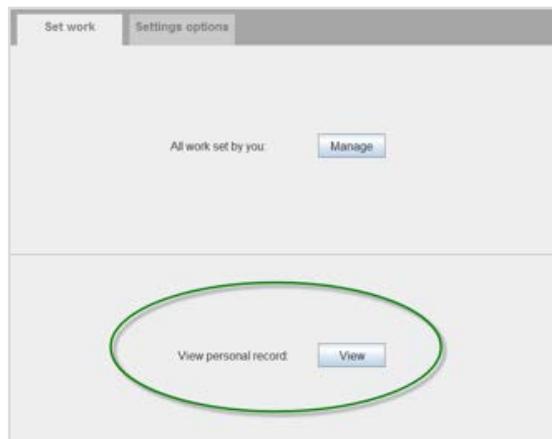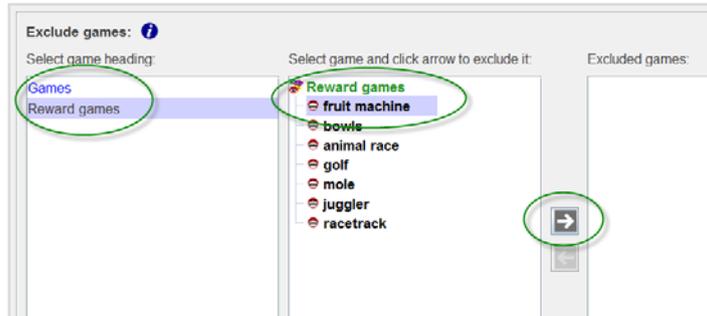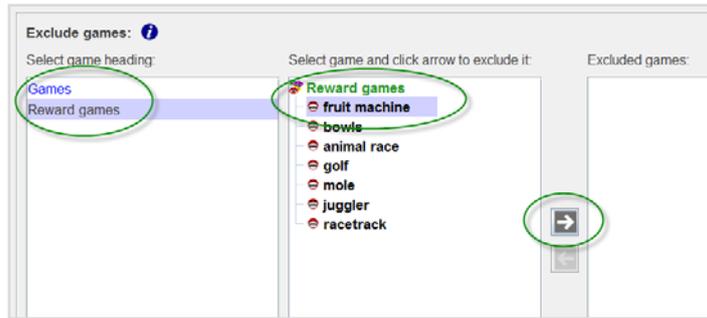
# Shared play

Two students can play collaboratively together. One person signs on, followed by a second user via *Users/Sign on another user*. Select *Users\ Share with*, which allows them to choose the person they want to share with. Both students work on the same topic and game. Bingo works well for this.
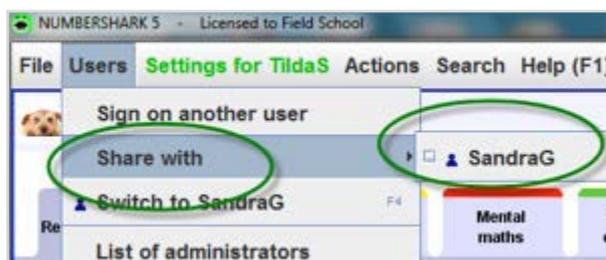
The program provides alternate turn taking – noted in the top bar, and adds to both scores. (This is different to signing on additional users, each with their own work, and switching manually between them by clicking on *Switch to*.)
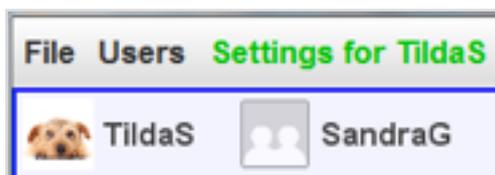
Un-tick the box when you want the sharing to end.

# Tailoring the program, maintaining progress, revision

## Customising the program to meet individual needs

In addition to the points below, you can find other useful ways to tailor the program in the menu under *Settings for (name)*.

**Higher achievers** can move more rapidly through the topics if few mistakes are being made.

Some games may include more challenges under *Options* when available (top left of the games screen). Speeds can be turned up. Some of the topics for written calculation can be played with mental arithmetic games like *Pick*, using estimation skills. A higher year group can be used in the *Worded problems*.

**Lower achievers** – The topics are finely graded to help master each small step. Make full use of demos by clicking on any 'sum'. Students – under *Settings for (name)* – may like to turn down, or turn off, the *Groans and beeps* that you hear when a mistake is made – in any case your sprite will tell you any errors because it reacts visually.

Lowering speeds to give 'thinking time', and using games which impose no time limit can help give success.

Worded problems can be read aloud when clicked on.

**Younger children** – will benefit from frequent quality supervision from an adult to get the most out of the program. It is best to work through the recommended games first for any topic guided by the order shown.
Some games may include simpler versions under *Options* when available (top left of the games screen).

Lower the speeds of games when necessary. Consider giving each child an icon which will help at sign-on.

**Secondary school use** – The Numbershark *National Curriculum* course provides a graded course but does not include the year group in the topic titles ( apart from year 1). This is helpful as these topics can be set for older students who are experiencing difficulties, without reference to a particular year group. Alternatively pick topics from other Numbershark courses which address specific requirements.

Consider excluding any games which, in your opinion, might appear too 'young'. Go to *Admin\Universal settings* to do this.

See also under the PDF 'National Curriculum, KS3 Revision'.

**Dyslexia** – Make full use of games which do not impose a time limit, to give thinking time e.g. *Pick, Pairs, Bingo* etc (even though the clock is still running).

Games instructions and worded problems can be read aloud if you click on them. Headphones may be useful.

The game *Formal sums* moves through algorithms for written procedures, reducing the load on short term memory.

**Dyscalculia** – the whole of Numbershark is tailored to accommodate dyscalculia. The finely graded topics are essential.
Consider deferring the games under the *Mental maths tab* until concepts have been mastered in each topic area.

The game *Which?* is useful for judging the size of groups (with the option only ticked for *objects*) and possibly *Conserve* played with the speed turned up.

**Dyspraxia** – Consider turning speeds down. For *Sharks* -tick the box for *Automatic shark catching* under Options (top left of the screen). For *Maze* – reduce the complexity of the maze under *Options*.
Games that do not impose a time limit will also be easier to play.

**ASD and ADHD** – Consider ticking the box for *Static games icons* under *Settings for (name)*. Set work with a restricted number of topics and games so as to reduce stimulus. Headphones will be useful.

**Meares-Irlen Syndrome/Scotopic Sensitivity** – Adjust the *Background colour* in games under *Settings for (name)*.

## Maintaining progress
When left unsupervised, some students could make little gains from the program because they may revert to a very simple topic and/or play their favourite game(s) repetitively.

Check that the topics and games that they are playing are relevant. Also, by viewing their records, you can check they are playing each game all the way through. We suggest when a student is down to only 1 error in a topic– move to the next. If the next topic is really too easy – miss it out.

**Revision**

Revision is available two ways:

1. Once a student has completed a block of topics under a green heading, select the green heading itself, for *Automatic Progression*. The program will automatically move through all the topics under this heading. Any repeated errors will result in extra practice in the relevant topic(s).

2. Use lists with the word *General* in the title e.g. *General addition with answers to 20,* or with *Mixed* in the title e.g. *Mixed tables to 12.*