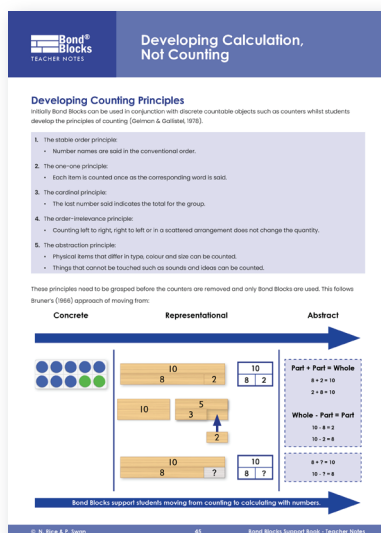


A significant strength of Bond Blocks is that it has been designed to cater for students who experience learning difficulties. These Teacher Notes outline the features of the Bond Blocks System and Activity Boards that can support students with a range of learning difficulties.

For information to support students with Specific Learning Difficulties in Mathematics (Dyscalculia) please read the **Teacher Notes** “*Developing Calculation Not Counting*”.

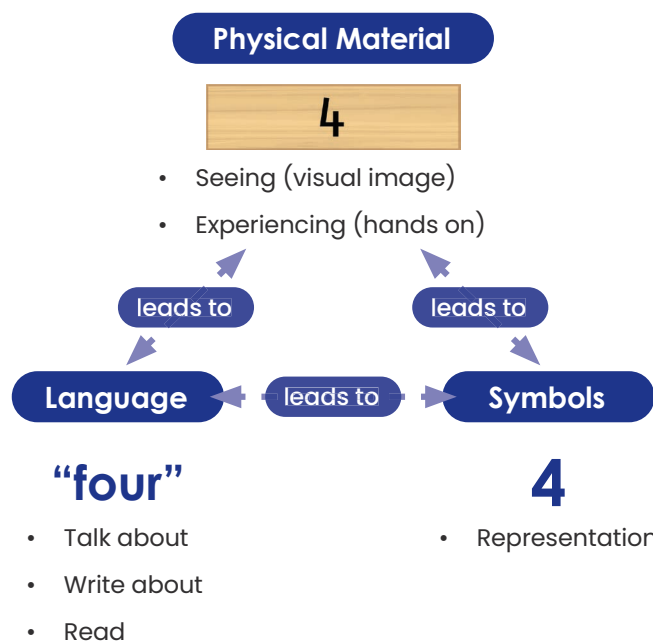


Bond Block System Features:

These features have been built into the Bond Block System to support students with learning difficulties:

Explicit Connections

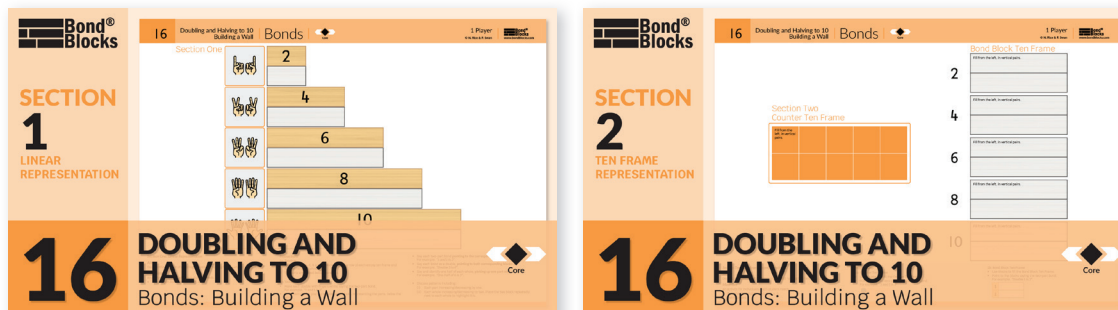
Bond Blocks are explicitly linked to the appropriate mathematical language and symbols.



Video Modelled Teaching

Every activity is modelled in a video. These videos model **how to complete the activity**, but more importantly they model **connecting the mathematical manipulatives, language and symbols** to help students develop a robust understanding of the mathematical concept.

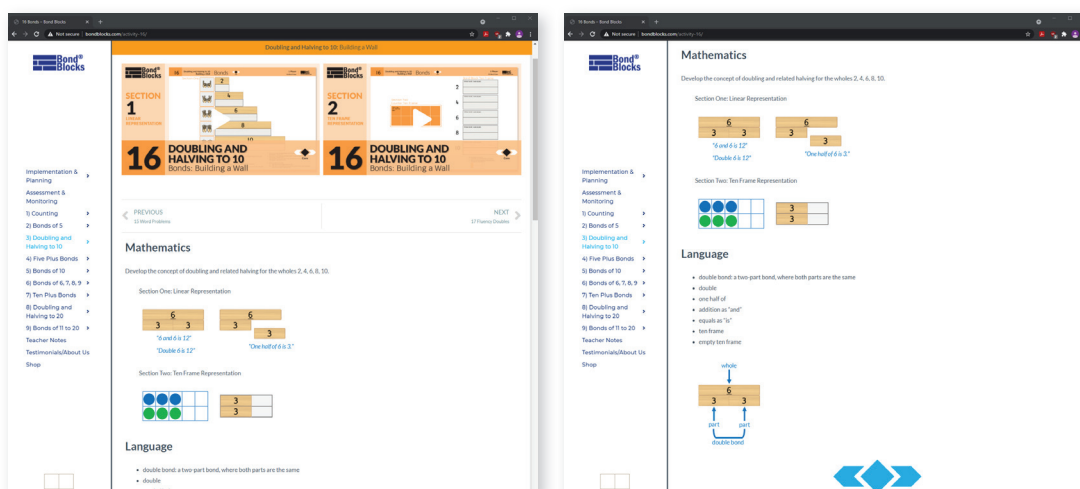
The videos are short, give clear direct instructions and are free from distracting visuals.



They can be:

- Used by teachers to introduce the activity to students.
- Used by teachers when instructing Education Assistants about the activity. Teachers introduce the activity in the first session of the week. Education Assistants can oversee students repeat the activity, the same week, to develop fluency.
- Watched independently by students. Some students like to watch the video to begin the second session of the week, as a reminder of what to do, before repeating the activity to develop fluency. Students who are anxious or find change difficult can find it helpful to watch the video independently before seeing the teacher introduce the activity for the first time that week.
- Watched by parents who may oversee fluency practice when their children bring activities home. Children with learning difficulties benefit from coordinated, consistent support through strong partnerships between home and school.

The website outlines the specific mathematics and language needed for every activity, supporting teachers to give clear, correct mathematical instruction.



The sequence and type of activities are repeated in each chapter. For example, the first activity in each chapter is building bond a wall. There are a minimal number of different types of activities. Most activities are based on Building a Wall or Tic-Tac-Toe. Developing procedural fluency with the activity enables students to focus on engaging in the mathematics.

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Ten Plus Bonds of 20
Tic-Tac-Toe

Subtraction

© 2012 Holt Rinehart & Winston

2 Player

100% **Skills**
100% **Meets**

Set A

| Player 1: | | Set B | |
|--------------|--------------|--------------|--------------|
| 20 - 16 = __ | 20 - 11 = __ | 20 - __ = 14 | 20 - __ = 13 |
| 20 - 10 = __ | 20 - 15 = __ | 20 - __ = 12 | 20 - __ = 11 |
| 20 - 17 = __ | 20 - 14 = __ | 20 - __ = 17 | 20 - __ = 20 |
| 20 - 20 = __ | 20 - 19 = __ | 20 - __ = 10 | 20 - __ = 19 |
| 20 - 18 = __ | 20 - 17 = __ | 20 - __ = 16 | 20 - __ = 14 |
| 20 - 12 = __ | 20 - 13 = __ | 20 - __ = 15 | 20 - 18 = 18 |

Set A

| Player 2: | | Set B | |
|--------------|--------------|--------------|--------------|
| 20 - 16 = __ | 20 - 11 = __ | 20 - __ = 14 | 20 - __ = 13 |
| 20 - 10 = __ | 20 - 15 = __ | 20 - __ = 12 | 20 - __ = 11 |
| 20 - 17 = __ | 20 - 14 = __ | 20 - __ = 17 | 20 - __ = 20 |
| 20 - 20 = __ | 20 - 19 = __ | 20 - __ = 10 | 20 - __ = 19 |
| 20 - 18 = __ | 20 - 17 = __ | 20 - __ = 16 | 20 - __ = 14 |
| 20 - 12 = __ | 20 - 13 = __ | 20 - __ = 15 | 20 - 18 = 18 |

Section One

Rules

Click the first player to place three counters consecutively in a row, column or diagonal.

Materials

- 1 spinner for pairs. (See page inside.)
- Appropriate ten-frames for each player.

Instructions

The number on the spinner matches the missing number (empty line) in each equation.

Player One:

- Click the spinner.
- Think "What **plus** number equals (number spin) twenty!"
- Look for the **number that plus** with the number spin will build the whole.
- Place that number on the ten-frame to complete the equation.
- Tap the **minus** equation.
- Tap the **number** equation.

Player Two: It's their turn.

If a player spins a number they have already filled in they skip the board. For example, "17" and "20" is already in the board.

Whole

| | |
|------|------|
| Part | Part |
|------|------|

Part + Part = Whole

Whole - Part = Part

Assist students by pointing to the answer part of the equation. Ask, "What plus with this is the number?" Then number (the unknown part) is what the student wants to learn.

Note: This activity can be played as three boards. Set A, Set B and Set C.
www.holtbrink.com

A8 Section 1 Subtraction Tic-Tac-Toe

Subtraction

Player 1

| | | | |
|--------------|--------------|--------------|--------------|
| 20 - 16 = __ | 20 - 11 = __ | 20 - __ = 14 | 20 - __ = 13 |
| 20 - 10 = __ | 20 - 15 = __ | 20 - __ = 11 | |
| 20 - 17 = __ | | 20 - __ = 17 | 20 - __ = 20 |
| 20 - __ = 19 | | 20 - __ = 10 | 20 - __ = 19 |
| 20 - 11 = __ | | 20 - __ = 16 | 20 - __ = 14 |
| 20 - 12 = __ | | 20 - __ = 15 | 20 - __ = 18 |

Player 2

| | | | |
|--------------|--------------|--------------|--------------|
| 20 - 16 = __ | 20 - 11 = __ | 20 - __ = 14 | 20 - __ = 13 |
| 20 - 10 = __ | 20 - 15 = __ | 20 - __ = 12 | 20 - __ = 11 |
| 20 - 17 = __ | 20 - 14 = __ | 20 - __ = 17 | 20 - __ = 20 |
| 20 - 20 = __ | 20 - 19 = __ | 20 - __ = 10 | 20 - __ = 19 |
| 20 - 18 = __ | 20 - 17 = __ | 20 - __ = 16 | 20 - __ = 14 |
| 20 - 12 = __ | 20 - 13 = __ | 20 - __ = 15 | 20 - __ = 18 |

Anchor Chart:

- Whole = Part + Part
- Part = Whole - Part
- Part = Part

Tic-Tac-Toe Activity



Gradual increases in difficulty

The mathematics within the Bond Block system has been broken down into carefully sequenced steps. Each activity increases in difficulty by one step and builds on the mathematics in prior activities.

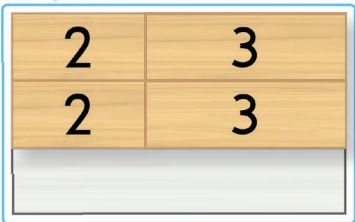
Please note, that whilst activities appear the same from chapter to chapter they **change subtly** to increase the level of difficulty. These key changes are pointed out in the video and written on the activity board in bold. Please look out for these changes and highlight them to students.

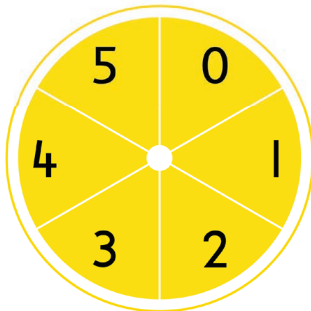
For example, the first-time students Build a Wall as a 2 Player game they:

- Have to fill their wall but can use any combination of blocks that make five. This means they can repeat bonds in their wall. Such as placing a row of 2 and 3 twice.
- They have to pick up both blocks that make the bond.

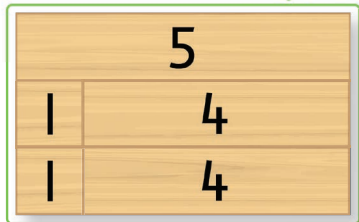
| | | | | | |
|----------|------------------------------|----------------|---|--|--|
| 7 | Bonds of 5 Filling a Wall | Fluency |  Core | 2 Player <small>© N. Rice & P. Swan</small> |  <small>www.bondblocks.com</small> |
|----------|------------------------------|----------------|---|--|--|

Player 1





Player 2



Aim
To be the first player to fill their wall with Bond Blocks.

Materials
A game for pairs. Each pair needs:

- Two of each Bond Blocks 1, 2, 3, 4, 5 in a jumbled pile within reach of both players.

Instructions

Player One:

- Flick the spinner.
- Hold up this many of fingers.
- Say the two-part bond that makes 5.
 - (i) "Fingers up [known part spun],
 - (ii) and fingers down [previously unknown part]
 - (iii) is 5 [whole hand]."
 For example, "2 and 3 is 5".
- **Pick up both blocks** that join to make the two-part bond of five.
- Place these blocks on their wall.

Player Two has their turn.

If a player spins a number and there are no blocks left to collect, they say the bond, but do not collect any blocks.

Students will need to use the commutative property of addition. For example, spinning 2 and 3 counts as 3 and 2. The same blocks are collected for each spin.

The Commutative Property of Addition: swapping the position of the parts does not alter the size of the whole.

When the spinner lands on a line, the player who flicked it chooses the side of the line on which the spinner finishes.

However, when this Build a Wall game appears for the second time it is slightly harder. They:

- Have to build every bond of five. That is zero and five, one and four, two and three. They are not allowed to repeat a bond such as placing two and three twice.
- Only place one block, the answer to the equation, because this is the emphasis of the addition activity. Whereas in the earlier game they had to place both blocks because the emphasis was on the two-part bond.

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Bonds of 5

Building a Wall

Addition

Core

2 Player

© N. Rice & P. Swan

Bond®
Blocks
www.bondblocks.com

Player 1

Player 2

Aim
To be the first player to fill their mat with **EVERY** two-part bond of 5, that is, 0 and 5, 1 and 4, 2 and 3.

Materials
A game for pairs. Each pair needs:

- Two of each Bond Blocks 1, 2, 3, 4, 5 in a jumbled pile within reach of both players.

Instructions

Player One:

- Flick the spinner and **collect the block that joins** with the number spun to make 5. For example, spin 2, collect the 3 block.
- Place the block on the frame saying the bond as an addition equation. For example, "2 **add** 3 **equals** 5".
- When placing additional blocks in the frame place them to build 5. Place 2 and 3 in the same row, 1 and 4 in another, and 0 and 5 in another row.
- If a player spins a number they have already spun, they say the equation, but do not collect any blocks.

Player Two has their turn.

Note: Teach the commutative property by identifying different ways players build their bonds. For example, the bond of 2 add 3 is equal to 3 add 2. It doesn't matter in which order the blocks that represent parts are placed.

The Commutative Property of Addition: *swapping the position of the parts does not alter the size of the whole.*

Whole

Part

Part

Part + Part = Whole

To be the first player to fill their mat with **EVERY** two-part bond of 5, that is, 0 and 5, 1 and 4, 2 and 3.

Flick the spinner and **collect the block that joins** with the number spun to make 5. For example, spin 2, collect the 3 block.

A multisensory approach.

Activities involving doing, seeing, saying, and hearing. Students do the activity with their blocks hands, see the visual representation, say the bond aloud and hear others say it. Actions and statements to be said are specifically *stated on the activity boards in **bolded italics***. The aim is to increase neurological connections, understanding and memory retention.

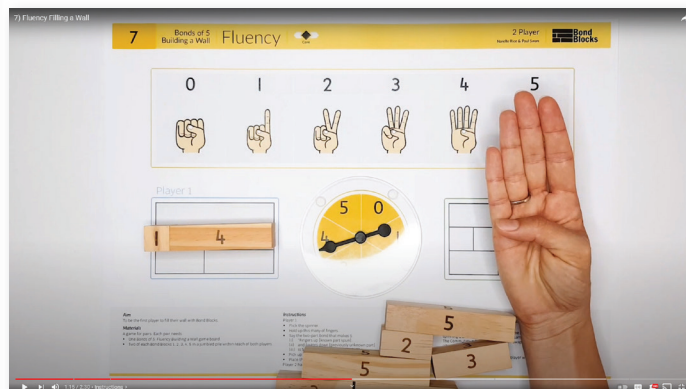
7 Bonds of 5 Filling a Wall | Fluency | 2 Player

Aim: To be the first player to fill their wall with Bond Blocks.

Materials: A game for pairs. Each pair needs:
• Two of each Bond Block 1, 2, 3, 4, 5 in a jumbled pile within reach of both players.

Instructions:
Player One:
• Flick the spinner.
• Hold up the many of fingers.
• Say the two part bond that makes 5.
• (i) "Fingers up (known part equal)"
• (ii) "Fingers down (previously unknown part)"
• (iii) "It's 5 bonds made!"
• For example: "Bond 3 is 2".
Player Two: Make the 2 parts to make the two part bond of five.
• Place 5 bond blocks on their wall.
• Player Two has their turn.

Notes: If a player spins a number they have already filled, they may the bond, but do not collect any blocks. Students will need to use the commutative property of addition. For example, spinning 2 and 3 leads to 3 and 2. The same blocks are collected for each spin. **The Commutative Property of Addition: swapping the position of the parts does not alter the size of the whole.** When the spinner lands on a line, the player who rolled it chooses the side of the line on which the spinner lands.



Additional support activities.

Every activity is differentiated. See the Bond Block's activity web page for adjustment suggestions and ready-to-go download activities to make the activity a little easier.

41 Ten Plus Bonds Three In A Row | Bonds | 2 Player

Scoring Track

| | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|----|----|----|----|----|----|----|----|----|----|

Player 1: Counter Ten Frame

Player 2: Bond Block Ten Frame

Aim: To be the player who places the third counter in a row consecutive order on the scoring track.

Instructions:
Player One: Counter Ten Frame
• Flick the spinner.
• Say the addition equation.
• Represent this with counters.
• Place a counter on the matching number on the scoring track.
• Do not clear the ten frame after each turn. Instead add or subtract counters to make the new number.

Player Two: Bond Block Ten Frame
• Flick the spinner.
• Say the addition equation.
• Represent this number with Bond Blocks.
• Place a counter on the matching number on the scoring track.
• Do not clear the frame after each turn. Instead replace blocks to make the new number.
• Players swap roles to use the alternate manipulative (counters or blocks) after each game.

Materials: A game for pairs. Each pair needs:
• Twenty counters.
• Bond Blocks 1, 2, 3, 4.
• Two 5 Bond Blocks.

Notes: If a number is spun that the player has already made, they make this amount with the counters and blocks, but do NOT place a counter on the scoring track. Players swap roles to use the alternate manipulative (counters or blocks) after each game.

Activity 41 additional support activities.

Web page Differentiation for Activity 41

Differentiation

A little easier

Sequencing cards:
Download Ten Plus Bonds Sequencing Numbers to 20 Cards from the top of the page.
Cut out the cards. Randomise the order within each set of cards (hands, empty ten frames, numbers) to complete the following activities.


Comparison Language Chart

41 Ten Plus Bonds Sequencing Numbers to 20 Cards

Downloads for Activity 41

Supportive of students with memory difficulties.

Students who have difficulty remembering bonds can be supported by downloading part-part-whole visuals. Students use these when playing games. Using the visual support frees the student's working memory and allows them to engage in the higher order mathematic thinking, such a developing calculation strategies and problem solving.



DOWNLOAD

Bonds of 6, 7, 8, 9

Part-Part-Whole: Desk Visual

| | |
|---|---|
| 6 | |
| 0 | 6 |

| | |
|---|---|
| 6 | |
| 1 | 5 |

| | |
|---|---|
| 6 | |
| 2 | 4 |

| | |
|---|---|
| 6 | |
| 3 | 3 |

| | |
|---|---|
| 7 | |
| 0 | 7 |

| | |
|---|---|
| 7 | |
| 1 | 6 |

| | |
|---|---|
| 7 | |
| 2 | 5 |

| | |
|---|---|
| 7 | |
| 3 | 4 |

| | |
|---|---|
| 8 | |
| 0 | 8 |

| | |
|---|---|
| 8 | |
| 1 | 7 |

| | |
|---|---|
| 8 | |
| 2 | 6 |

| | |
|---|---|
| 8 | |
| 3 | 5 |

| | |
|---|---|
| 8 | |
| 4 | 4 |

| | |
|---|---|
| 9 | |
| 0 | 9 |

| | |
|---|---|
| 9 | |
| 1 | 8 |

| | |
|---|---|
| 9 | |
| 2 | 7 |

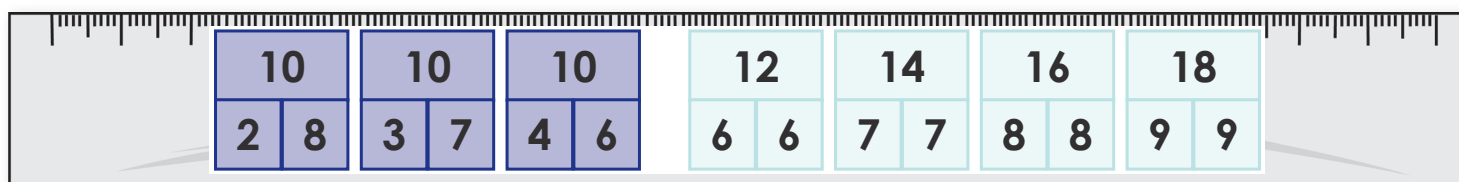
| | |
|---|---|
| 9 | |
| 3 | 6 |

| | |
|---|---|
| 9 | |
| 4 | 5 |

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Bond Blocks Support Book - Differentiation

Desk Visual Download for Two-Part Bonds of 6, 7, 8, 9

Small sized, part-part-whole visual strip for difficult to remember bonds of 10 and doubles. Download and tape this to the back of a ruler for discrete use by older or self-conscious students.



For more information about how to use desk visuals read the **Teacher Notes** "Using Part-Part-Whole Desk Visuals".

Activity Board Features

These features have been built into the Bond Block Activity Boards to support students with learning difficulties:

Free of visual distraction

This supports students with visual discrimination difficulties. The aesthetics of the game boards have been designed to be sensitive of older students using them for Wave 3 intervention.

Played in pairs

This increases the amount of time spend practising the skill and reduces the amount of time available for the student to become distracted.

Embedded with student accountability measures for:

- i) correct practice of mathematics.
Bond blocks are self-checking. Frames on the boards ensure correct placement of blocks.
- ii) correct use of mathematical language.
The correct mathematical language to be used is written on the activity board.
- iii) students' cognitive participation.
Accountability measures are built into games. Each player has a role. For example, if the watching player identifies an incorrect calculation they move forward 3 spaces and the player in error moves back 2 spaces.

Always orientated correctly

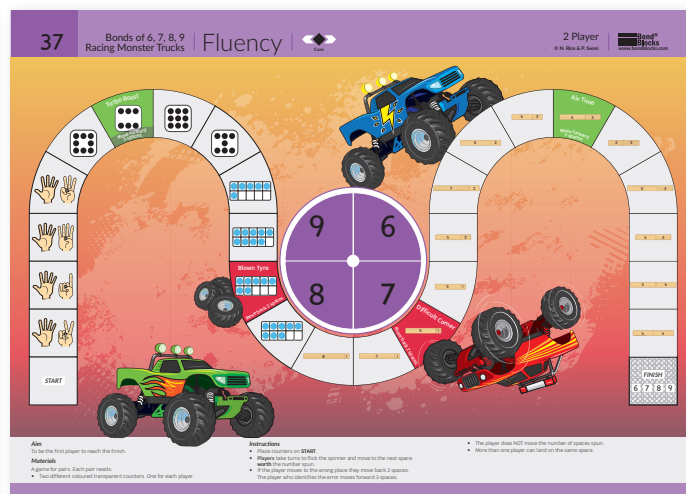
- Students engage in activities students sitting side by side.
- The A3 game board and blocks are positioned directly in front of each student.
- Player One is always coloured blue and positioned on the left. Player Two is green and on the right.

These measures help to reduce visual tracking and physical coordination difficulties.

Sitting side by side is non-confrontational for students with autism spectrum disorders.



- **Player One** is always blue, sits on the left and goes first. **Player Two** is always green, sits on the right and goes second. The boards and counters are colour coded blue and green.
- On track-based activity boards landing on a **green space** means move forward 3 spaces. Landing on a **red space** means move back 2 spaces. This supports students with reading difficulties.



When activities or games require a concrete representation counters are used.

- Counters with a 25 millimetre diameter were chosen because they are easier to manipulate. The counters are blue and green to match the blue and green player colours.

[illegible]

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