How The Game Works

There are two play modes in NumBots that serve different purposes.

1. Story Mode for Understanding

In Story Mode, the emphasis is on mathematical concepts and is underpinned by a mastery approach to teaching. Story Mode features visual representations, procedural variation, exposure to different calculation strategies and interleaved material all in very carefully sequenced order.

Unlocking Levels

Story Mode is set out as a series of Stages (Rust, Tin, Iron, etc) containing levels, a bit like Angry Birds. Rust is the first Stage and level 1 is unlocked, so this is the place for *everyone* to start.

To unlock the next level, players need to earn two stars by showing sufficient proficiency.

The levels in Story Mode follow a natural mathematical progression and move the pupil through the game automatically,

Mental Strategies Defined

Compensation – when you add or subtract too much and then adjust, e.g. to add numbers like 19/29/39, etc you might add 20/30/40 and then subtract 1.

Bridging to a multiple of 10 – when you split the second addend so that count up to the nearest multiple of 10 and then count on the remainder, e.g. to add 27 and 5 you might add 3 then add 2. The same principle applies in reverse when subtracting, e.g. for 23 – 5.

Partitioning – when you split (partition) the 10s and 1s and add/subtract them separately before recombining, e.g. to add 27 and 32 you might add 20 and 30, 7 and 2 and then combine the totals.

Different Sessions, Different Aims

Story and Challenge modes both have their place. We recommend that pupils are encouraged to "help Rusty to shine" (play in Story mode) for the most part and then to "beat your own high score" (play in Challenge mode) at the end of each session or week.

Game Types

1. Story Mode – the emphasis is on learning the ideas and concepts behind addition and subtraction so it features more diagrams, shapes and question styles.
2. Challenge Mode – the emphasis is more on speed of recall of key facts, like number bonds to 10, doubling small numbers or adding & taking away in your head.

Different Sessions, Different Aims

Story and Challenge modes both have their place. We recommend that pupils are encouraged to "help Rusty to shine" (play in Story mode) for the most part and then to "beat your own high score" (play in Challenge mode) at the end of each session or week.

2. Challenge Mode for Recall

In Challenge Mode, the emphasis is on rapid responses to essential facts and simple sums, against the clock.

Unlocking Challenges

Challenge Mode is locked for new users and is unlocked once players reach a certain level on Story Mode. It's currently set to unlock part way through Tin stage.

There are 20 Challenge levels and only the first is unlocked to begin with. To unlock the next Challenge, players must correctly answer 12 questions in a minute.

Key Skills

Each Challenge focuses on a key skill, as follows:

No,	Key Skill	Example
1	Adding and subtracting 1 or 2 within 10	$1 + 3, 8 - 2$
2	Number bonds to 5	$3 + ? = 5$
3	Doubles within 10 (i.e. up to 5+5)	$4 + 4$
4	Adding and subtracting 1 and 2 within 20	$17 + 2, 11 - 1$
5	Number bonds to 10	$3 + ? = 10$
6	Adding and subtracting 10 within 20	$3 + 10, 16 - 10$
7	Doubles within 20 (i.e. up to 10+10)	$8 + 8$
8	Adding two 1-digit numbers	$5 + 7$
9	Number Bonds to 20	$8 + ? = 20$
10	Subtracting 1-digit numbers within 20	$14 - 6$
11	Adding and subtracting 1, 2 and 10 within 100	$1 + 74, 51 - 2, 38 + 10$
12	Adding and subtracting 2-digit numbers to/from multiples of 10	$20 + 64, 83 - 20$
13	Addition by bridging a multiple of 10	$25 + 6, 47 + 5$
14	Subtraction by bridging a multiple of 10	$25 - 6, 42 - 5$
15	Number bonds to 100	$52 + ? = 100$
16	Using compensation to add and subtract within 100	$35 + 19, 35 - 19$
17	Adding by partitioning two 2-digit numbers	$64 + 25, 10 + 64$
18	Subtracting by partitioning two 2-digit numbers	$64 - 23, 47 - 31$
19	Adding any two 2-digit numbers	$63 + 56, 63 + 58$
20	Subtracting any two 2-digit numbers	$76 - 43, 76 - 47$