Calabash Guide for Teachers (Version 1.0)

https://gotectonic.org/c

Contents

Develop student number-fluency through daily ten-minute practice

Overview

The challenge in teaching mathematics is that most students don't naturally develop good number-fluency, so they struggle to add, subtract, multiply and divide. That leads to two major problems:

1) Slow mathematics learning because students can't practice new concepts (e.g. you need multiplication to calculate the area of a rectangle)
2) Difficulty problem solving in the real world (e.g. thinking through the distances, timing and costs involved in an upcoming trip)

Calabash is a web app that sequentially develops student number-fluency through daily ten-minute practice. Some of the benefits are:

- Animated training when students make a mistake to help them visualise and understand the question
- Almost no barrier to entry as Level 1 teaches counting to 5
- A lot of room for growth because students who have mastered the four operations (+ - x ÷) move on to place-value operations (e.g. 40 x 60 =) and then fractions
- A design that allows students to practice independently, so it can be used as a whole-class activity or as part of rotations

The original inspiration for Calabash came from peer-reviewed research. After conducting a review into the most effective method for teaching multiplication, I created an app. To have a solution that is ready to share it has taken:

- 12 years of development
- Three prior apps: Banufa, Number Mine, and Numble
- Countless paper-based systems

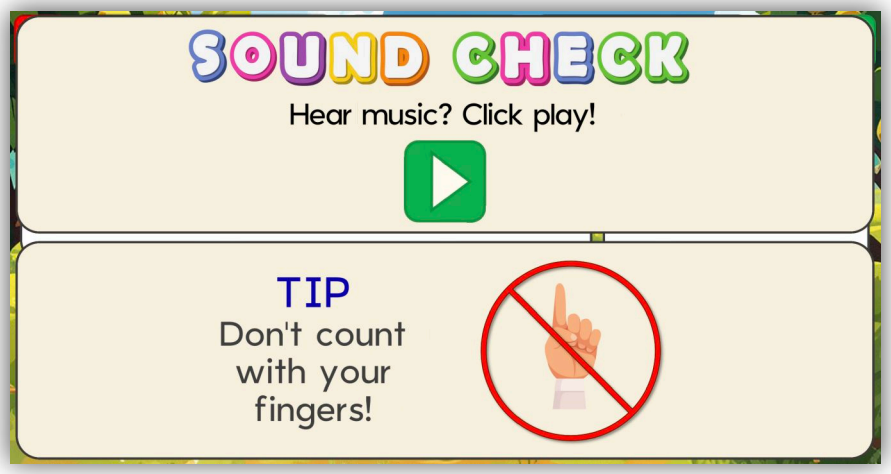
Calabash is available now because I'm confident it can support a wide variety of learners. It has been trialled in several classrooms, including a special education setting.

Features

Operations (+ - x ÷)

To start from Level 1, students launch the app and tap on the lemon character, Calabash. Alternatively, pressing the 'Operations' button will bring up three options:

- **Start** is the same as tapping the lemon character, Calabash.
- **Boost Start** is for students who have reached the first multiplication level, Level 26. Boost Start has an addition question to check students are ready and begins at Level 22.
- **Practice Mode** has no timer and allows you to jump to any level. It allows for one-to-one support with a specific level.



When students begin practice, a Sound Check will come up and start playing music to ensure that sound is working. If you're using an iPad or iPhone and can't hear, make sure

Silent Mode is switched off. There's also a reminder not to count with fingers to encourage students to visualise the questions.
Students always start from Level 1 but can move through a level they are confident with in just a few seconds. Starting from Level 1 prevents a problem where students advance to new levels and then forget what they learned in previous levels. Supporting consolidation is a key reason that Calabash works for such a wide range of students.

The training is specific to each level and question. There are three ways to trigger the training:

1) Making a mistake
2) Taking too long
3) Pressing the '?' button

Each question stays up until the student has correctly answered it even if they initially made a mistake. The tick that comes up and the 'Responses' dots at the top of the display can be one of three different colours:

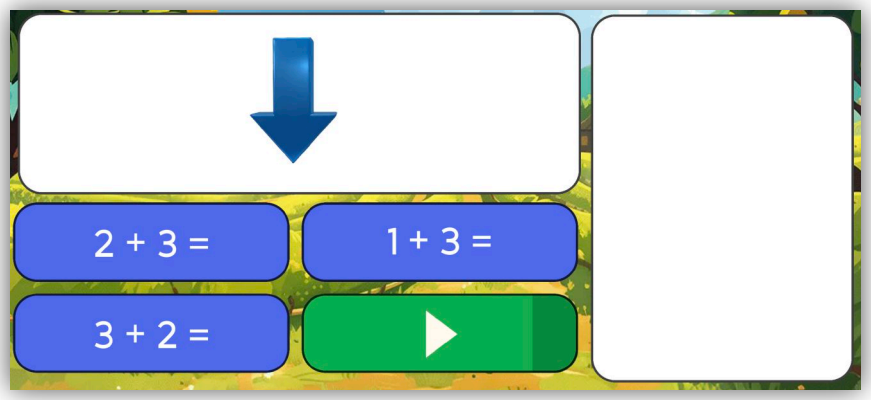
Green (1 point): Correct and quick

Light green (1 point): Correct but not very quick

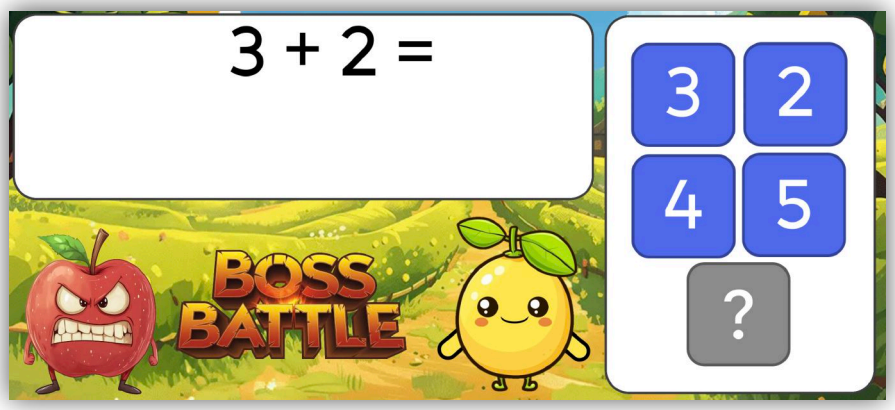
White (0 points): Made a mistake, requested training, or responded slowly

If you get three green dots in a row, or two dots at the start of the level, you move to the next level. If you get three white dots in a row you enter a Boss Battle.

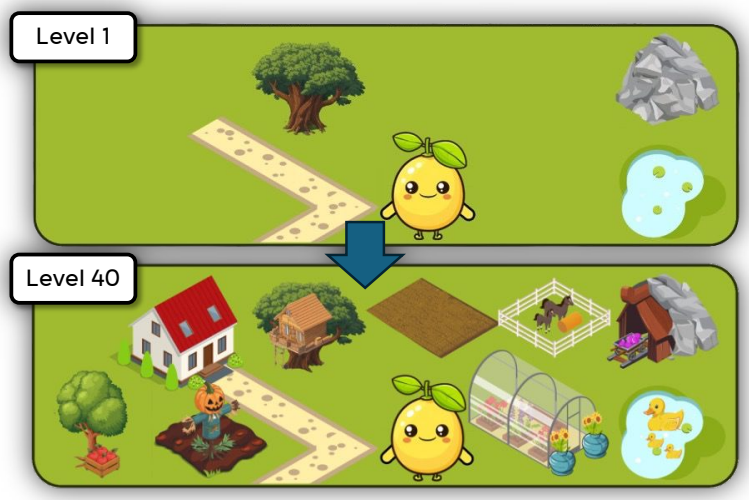
Boss Battles



A Boss Battle is designed to give students focussed practice on three questions they need to master. In the first stage, they have the opportunity to practice by clicking on the questions. When they are ready, they click the green play button.



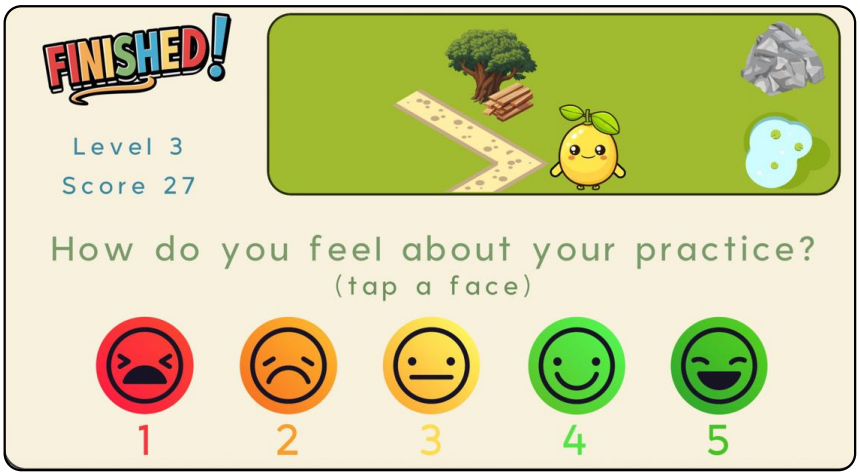
If they answer the three questions quickly and correctly, they win the Boss Battle and return to the level they were on. Otherwise, they go back to preparing for the Boss Battle.



As students pass each level, Calabash develops his farm.

Finishing

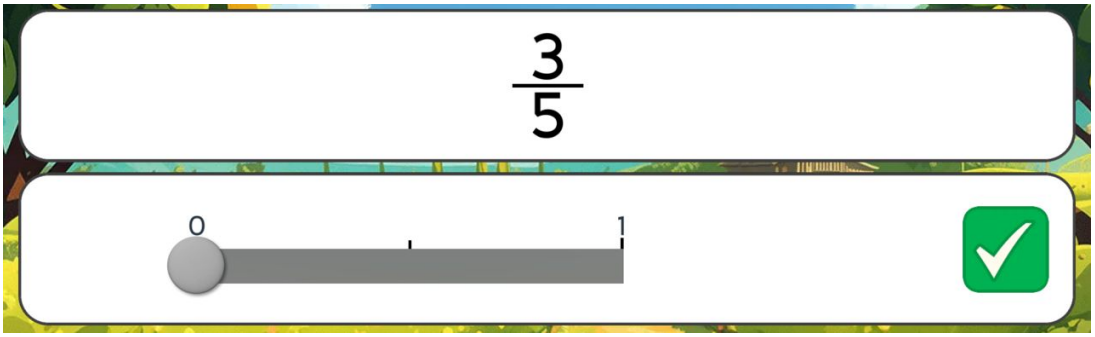
The timer at the top of the screen runs for ten minutes and then the Finished screen comes up.



Students finish by rating how they are feeling about their practice. The results will also show in the log at the bottom of the screen and should remain even after a device restart.

Once a student can complete all 40 levels within the time, start recording the time they take and challenge them to get it down to under five minutes. Even after they can do that, occasional practice will help to maintain their skill level. Once students no longer need daily practice, they can begin the Fractions challenge.

Fractions



The Fractions feature is very similar to Operations. It covers:

- Fractions (proper, improper and mixed)
- Decimals (between zero and two with up to three decimal places)
- Percents (0%-200%).

Levels A-K (1-11) involve moving a slider (the answer is correct if any part of the slider head covers the correct answer). Levels L-O (12-15) involve picking the largest value from four options.

Guides

If you need to download this guide or find any related documents, such as the class tracker, just click on Guide from the main menu.

Implementation

Accessing

To make it easy to share and to set up, Calabash is free and does not require a login. It is a web-app and can be run through any browser, meaning it can be used on an iPad, PC, or Chromebook. The app can be used with a touch screen or a mouse. Students will need headphones. If the sound is not working on an iPad, make sure Silent Mode is disabled.

Calabash can be installed as a web-app on an iPad:

1. Load it in Safari
2. Click the share button
3. Select 'Add to Home Screen'

Scheduling

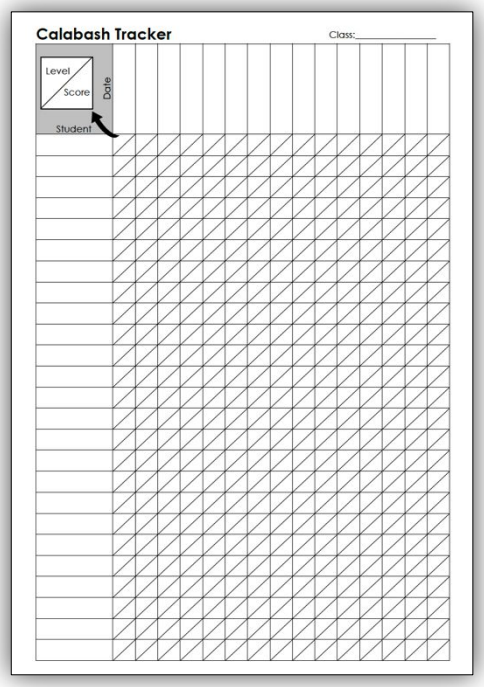
Calabash can be completed by the whole class at the same time if you have enough devices. It also works well with rotations since students can do it independently once they are familiar with the process. The practice takes ten minutes to complete and has a timer. However, allow at least 15 minutes for it to be started and completed during rotations.

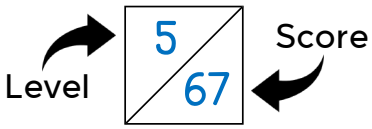
There are two important reasons for having students complete Calabash every day:

1. They will make much quicker progress
2. If it is not a daily habit, students may become reluctant to complete the practice

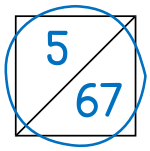
Record keeping

At the end of each practice session, the level and score that the student achieved is displayed. Print the class tracker with student names and complete one column each session.

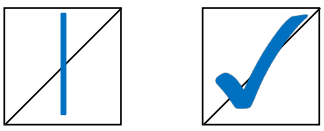




This is how the level and score are recorded in a single box.



If the student achieves a personal high score, the result is circled. Ask students not to talk about their level as it can make other students jealous. However, praise or reward students who achieve a personal high score.



If a student is absent, put a vertical line through the box. This ensures results aren't written in the wrong column. If a student claims to have finished but no score is displayed in the log, put a tick the first time. The second time they should complete the practice later.

If you're a classroom teacher without an assistant, recording this information during rotations can take some thought. Some apps record results and make them available on a web portal. Calabash doesn't do this for two reasons:

1. To avoid requiring sign up and login (making implementation much simpler)
2. You, as the teacher, are better aware of student progress

Supporting Students

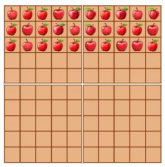
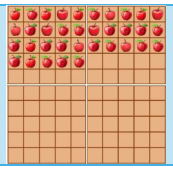
Though some Calabash levels take time to master, you can help students make steady progress by:

- Observing practice sessions to spot issues (e.g. finger-counting or not practising for Boss Battles).
- Using Practice Mode to jump straight to tough levels to work with a student. In Practice Mode you can pause and replay the training.
- For Levels 1-10 encourage them to visualise the addition or subtraction.
- For Levels 11-15 review the "make-ten" trick via the training animation (e.g. turning 8 + 4 into 10 + 2).
- For levels 29-30 (later multiplication) you can help them to memorise some of the solutions (e.g. 6 x 6 = 36).

Appendix

To see each level: Launch Calabash ➔ Click ‘Operations’ or ‘Fractions’ ➔ Click ‘Practice Mode’ ➔ Click the right-facing arrow to go to the desired level

Operations Levels

Level	Title	Example
1	Counting within 5	🍎🍎🍎
2	Adding within 5 (visual)	2 + 1 = 🍎🍎 + 🍎 =
3	Adding within 5	2 + 1 =
4	Subtracting within 5 (visual)	5 – 2 = 🍎🍎🍎🍎🍎 - 🐛🐛 =
5	Subtracting within 5	5 – 2 =
6	Counting within 10	🍎🍎🍎🍎🍎 🍎🍎🍎
7	Adding within 10 (visual)	4 + 3 = 🍎🍎🍎🍎 + 🍎🍎🍎 =
8	Adding within 10	4 + 3 =
9	Subtracting within 10 (visual)	8 – 2 = 🍎🍎🍎🍎🍎 🍎🍎🍎 - 🐛🐛 =
10	Subtracting within 10	8 – 2 =
11	Counting within 20	🍎🍎🍎🍎🍎 🍎🍎🍎🍎🍎 🍎🍎🍎
12	Adding within 20 (visual)	7 + 4 = 🍎🍎🍎🍎🍎 🍎🍎 + 🍎🍎🍎🍎 =
13	Adding within 20	7 + 4 =
14	Subtracting within 20 (visual)	12 – 3 = 🍎🍎🍎🍎🍎 🍎🍎🍎🍎🍎 - 🐛🐛🐛 = 🍎🍎
15	Subtracting within 20	12 - 3
16	Counting tens	
17	Adding tens	40 + 50 =
18	Subtracting tens	80 – 60 =
19	Counting within 100	
20	Adding ones	53 + 5 =
21	Subtracting ones	82 – 1 =
22	Adding by bridging through ten	34 + 8 =
23	Subtracting by bridging through ten	82 – 9 =

24	Adding tens & ones	63 + 32 =
25	Subtracting tens & ones	98 – 15 =
26	Multiplying by 1, 2 & 10	7 x 10 =
27	Multiplying by 5	5 x 8 =
28	Multiplying by 9	9 x 4 =
29	Multiplying by 3 & 4	3 x 6 =
30	Multiplying by 6, 7 & 8	7 x 6 =
31	Dividing basics	3 ÷ 1 =
32	Dividing by 2 & 3	6 ÷ 2 =
33	Dividing by 4 & 5	20 ÷ 5 =
34	Dividing by 6 & 7	54 ÷ 6 =
35	Dividing by 8 & 9	56 ÷ 8 =
36	Adding with place value	500 + 8 =
37	Subtracting with place value	620 – 600 =
38	Multiplying by 10 & 100	84 x 10 =
39	Dividing by 10 and 100	1100 ÷ 10 =
40	Multiplying with place value	4 x 600 =

Fractions Levels

Level	Title	Example
1	Fraction basics	1/2 (place on a number line)
2	Proper fractions	2/6 (place on a number line)
3	Decimal tenths	0.4 (place on a number line)
4	Decimal hundredths	0.55 (place on a number line)
5	Decimal thousandths	0.160 (place on a number line)
6	Percents (tens)	60% (place on a number line)
7	Percents (tens and ones)	72% (place on a number line)
8	Mixed numbers	1 3/5 (place on a number line)
9	Improper fractions	6/5 (place on a number line)
10	Decimals greater than 1	1.918 (place on a number line)
11	Percents above 100	101% (place on a number line)
12	Compare fractions	5/6 or 2/5 or 1/3 or 3/6 (pick the biggest)
13	Compare decimals	1.18 or 0.905 or 1.3 or 0.50 (pick the biggest)
14	Compare percents	78% or 53% or 171% or 190% (pick the biggest)
15	Compare all	7/6 or 23% or 2/5 or 1.80 (pick the biggest)