CUBE

learn the building blocks of math

TEACHER GUIDE

OWLET® MATH TOOLS

BY BIRDBRAIN INC. TECHNOLOGIES®

100% EMPLOYEE-OWNED

MEET CUBE

Cube is a sensor-enabled tower designed to develop knowledge of place value, including whole numbers, money, and decimals. Students work in pairs by stacking cubes in the 3 sensor-enabled tracks to create numbers and solve math problems.

An app offers math problems for students to solve, and Cube communicates to the app providing feedback to students in real-time.

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SETUP: POSITIONS

Cube can be folded and closed for easy storage alongside its pouch of 30 stacking cubes.

To set it up, pull down the tray from the end near the LEDs. Fold out the stand to tilt the columns.

Try placing cubes into the tower columns, and when you're ready to start fresh, press the buttons at the bottom of the tower to release! If it doesn't feel stable, be sure to pull the stand farther out.

SETUP: CHARGING

When you turn Cube on or off, it will display the battery status.

🟢🟢🟢	Fully charged
🟢🟢◯	Mostly charged
🟡🟡◯	Charge Cube soon
🔴◯◯	Charge Cube immediately

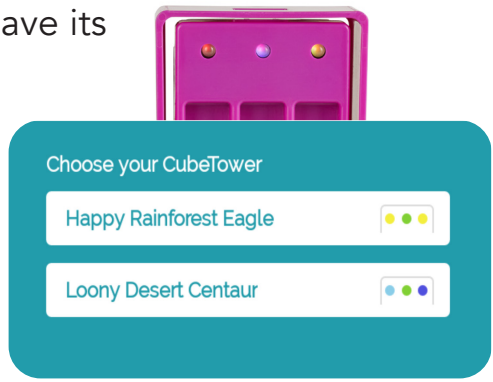
Use a micro USB cable (included) to charge Cube. You will see a small red/orange light by the plug. It will turn green when fully charged.

SETUP: CONNECTING TO A DEVICE

Download the Cube3 app. Turn on Cube by pressing the white power button at the top of Cube, near the three lights.

Scan to download apps >>

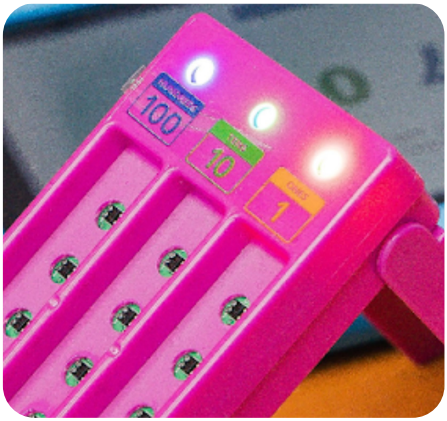
Open the Cube3 app and select the name with the sequence of colors that matches the three lights at the top of Cube. If you have multiple Cubes in the classroom, each will have its own unique name and color sequence!



OWLET MATH TOOLS

SETUP: ACCESSORIES

Cube comes with one optional accessory: labels! These sticker labels can be placed on Cube to remind students of the place value that each column represents.



	Hundreds 100	Tens 10	Ones 1	

	Dollars 1	Dimes 0.1	Cents 0.01	

	Tenths 0.1	Hundredths 0.01	Thousandths 0.001	

	Hundred Thousands 100,000	Ten Thousands 10,000	Thousands 1,000	

SETUP: TROUBLESHOOTING

If you run into any issues during setup or while using Cube, please go to our Help Desk to browse FAQs. If you don't find what you're looking for, please don't hesitate to contact us.

Help Desk

support.birdbraintechnologies.com

Contact Us

birdbraintechnologies.com/about-us/contact-us

OWLET MATH TOOLS

APP OVERVIEW

The Cube3 app generates math problems aligned to teachers' chosen category and activity mode. The app gives immediate feedback to students as they manipulate blocks to create numbers, whether they are exploring, practicing, or solving a math problem. The app will save students' work and generate teacher reports.

The Cube3 app has 5 categories:

Tens, **Hundreds**, **Money**, **Hundredths**, and **Thousandths**.

APP OVERVIEW: ACTIVITY MODES

Each category has 5 different activity modes. **Make**, **Build**, **Round**, and **Compare** randomly generate problems for students, while **Explore** is open-ended.

Explore: Place cubes to create numbers

Make: Make a target number by placing cubes

Build: Solve number puzzles

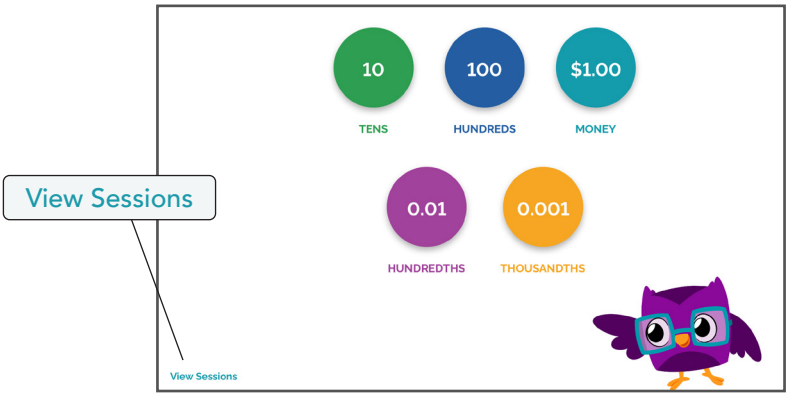
Compare: Create a number and then compare it to another number

Round: Round a number to a specified place

Because the math problems are randomly generated, different pairs of students will be given different problems.

APP OVERVIEW: TRACKING STUDENT WORK

The app automatically saves a summary of student work within a session. When a work period ends, teachers can check student work by clicking “View Sessions”.

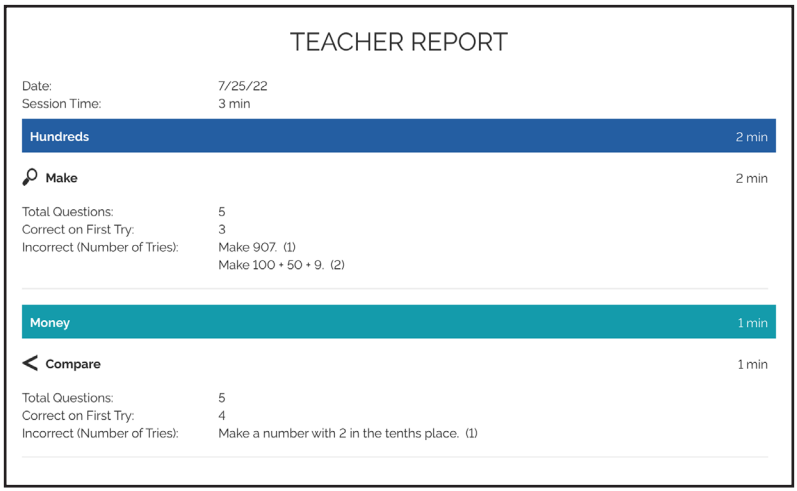


The “View Sessions” option can also be accessed during a work period via the number at the bottom right corner or from the app’s homescreen while disconnected from Cube.

APP OVERVIEW: TRACKING STUDENT WORK

The summary of students' work in each session includes how many problems they completed and how long they spent in each section. It also records how many incorrect attempts were made for each problem, and which problems were missed. Easily document student progress using one of our **free Student Performance Trackers (two versions)!**

NOTE:
Find these printables on our website!



TEACHER REPORT

Date:	7/25/22
Session Time:	3 min

Hundreds — 2 min

Make — 2 min

Total Questions:	5
Correct on First Try:	3
Incorrect (Number of Tries):	Make 907. (1) Make 100 + 50 + 9. (2)

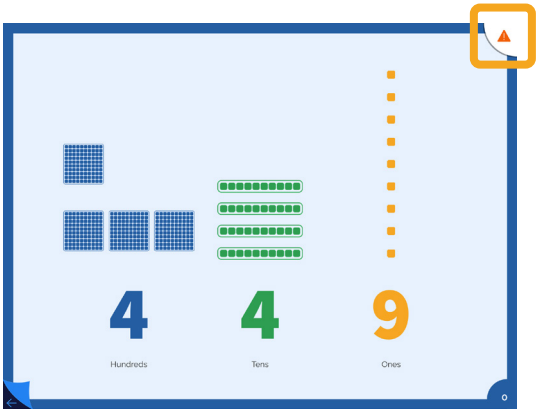
Money — 1 min

Compare — 1 min

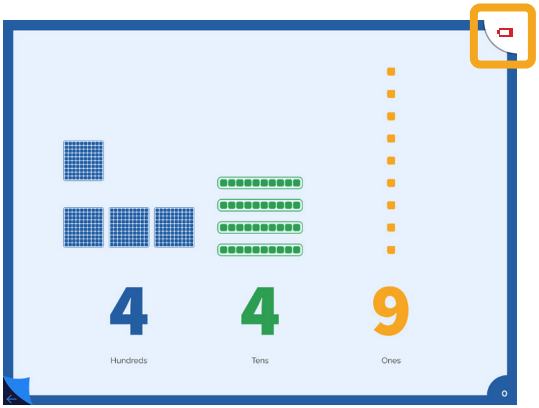
Total Questions:	5
Correct on First Try:	4
Incorrect (Number of Tries):	Make a number with 2 in the tenths place. (1)

APP OVERVIEW: ALERTS

If Cube becomes disconnected from the tablet/ computer, the app will show an alert. Click on the alert to bring up the 'scan for device' screen and reconnect.



A low battery alert will appear when Cube should be charged immediately.



CUBE6 APP

Cube6 is a clone of the Cube3 app that works with two towers, giving students six columns to create numbers with more digits.

Scan to go to apps >>

You can use all of the same teacher materials for Cube3 with Cube6. The only difference is that you must connect two towers to the app.

CUBE6 APP

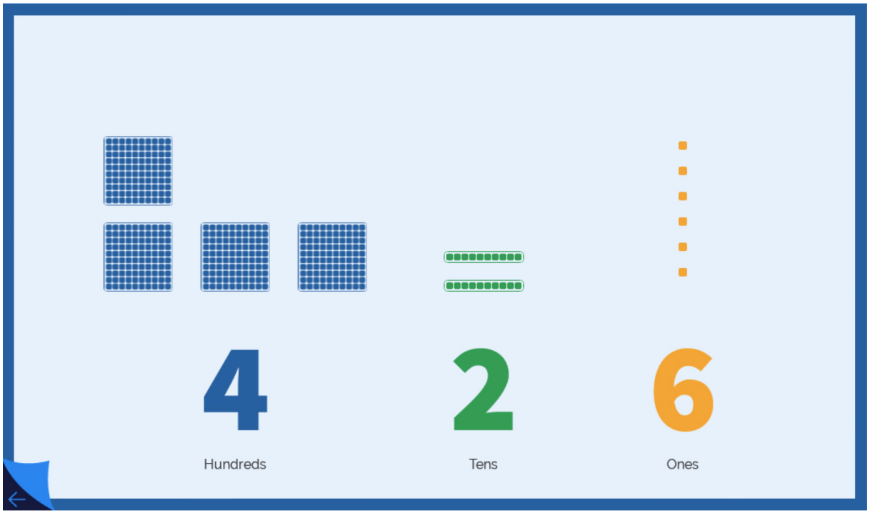
Turn on two Cubes and set them side by side. Open the Cube6 app and select the name with the sequence of lights that matches each tower; first the left, then the right.

EXPLORE: HOW IT WORKS

Choose your category. 10 100 $1.00 0.01 0.001

Tap the compass symbol for Explore mode.

Place cubes and see what happens in the app!



Do you notice anything about the color of Cube's LEDs and the values in the app?

EXPLORE: SAMPLE CLASSROOM INTRO

Learning Goal: Students will understand how to use the Explore activity mode

Key Terms: cubes, release button

Time: 5-20 min

Today we'll be exploring place value. You're going to create numbers by placing **cubes** in the columns of the tower. In the app, tap the (Tens/Hundreds/Money /Hundredths/Thousandths) category. Then tap the compass symbol for Explore mode. *Name the place value for each of Cube's columns.*

Take a few minutes to explore what happens when you put cubes in the tower. What do you notice? *Students will likely notice the biggest number they can make.* What is the smallest number you can make?

To release the cubes, you can gently push each **release button**. Give it a try.

Can you and your partner make the number ___? When you've made it, turn your tablet to me so I can see the number.

Consider leaving a post-it here with personal notes for your lesson.

EXPLORE: PROMPTS

1. The maker and the guesser: The maker holds the tablet and makes a number with Cube. The guesser looks at Cube and guesses the number without looking at the tablet. Then swap!

2. The writer and the modeler: The writer writes a number on paper or a small whiteboard, then the modeler has to use Cube to create the number. Then swap!

3. How many different numbers can you make with 3 cubes?

4. Make a number larger than ___ using 7 cubes. Do you think we will be able to make a lot of numbers that are larger or just a few?

5. Generate 10 numbers that round to ____. What is the largest possible number? What is the smallest?

EXPLORE: DISCUSSION

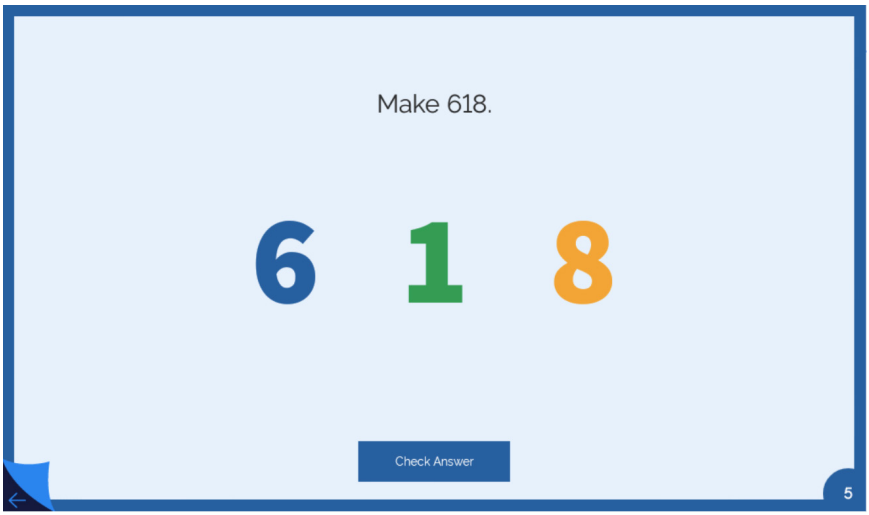
Can you find a number that you can't make with Cube? How do you think you could change the tower design to make this number?

MAKE: HOW IT WORKS

Choose your category. 10 100 $1.00 0.01 0.001

Tap the magnifying glass symbol for Make mode.

Place cubes to create numbers and solve challenges.



MAKE: SAMPLE CLASSROOM INTRO

Learning Goal: Students will understand how to use the Make activity mode

Key Terms: standard form, expanded form

Time: 5-20 min

Today we'll be using Cube to make numbers. In the app, tap the (Tens/Hundreds/Money/Hundredths/Thousandths) category. Then tap the magnifying glass symbol for Make mode.

The app will ask you to make a number in one of a few ways: in **standard form**, **expanded form**, or in words. *Discuss standard and expanded form.*

The app is asking me to make ___. How can I make that number with Cube?

MAKE: SAMPLE CLASSROOM INTRO

Have a student volunteer to add cubes to make the number. Ask the class to give a thumbs up or a thumbs down if they agree or disagree with the number. Once you place your cubes, tap "Check Answer."

Note: In the Tens and Hundreds modes, the number the student is making is shown in the app. In all other modes, the student sees question marks until they tap "Check Answer."

Your Notes

MAKE: PROMPTS

Work with a partner to make 9 different numbers. As you work, record all the numbers that you make. Then sort your list from largest to smallest.

- What is the largest number?
- What is the smallest number?
- What is the number in the middle?
- Which number required the most cubes to make?
- Which number required the fewest cubes?

MAKE: DISCUSSION

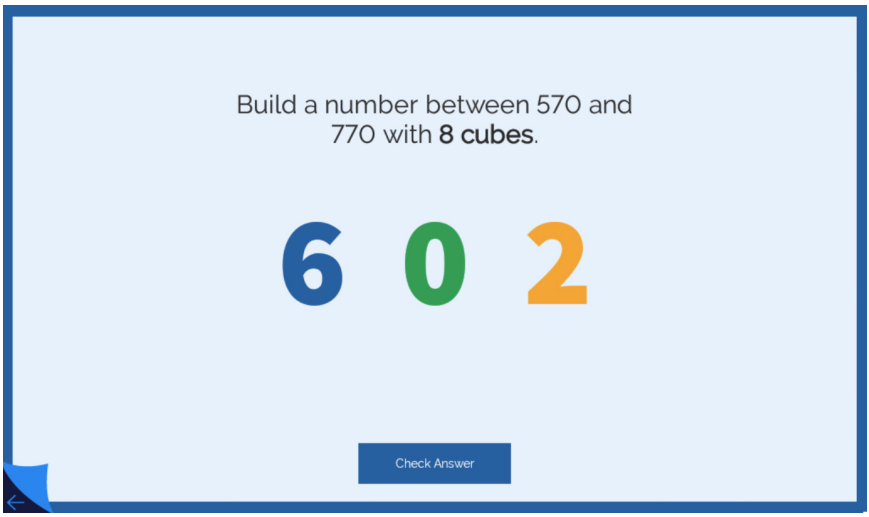
- What strategies did you use to make numbers?
- What math vocabulary did you hear [Partner Name] using as they described their strategy?
- Which of the numbers __ and __ requires more cubes to make?
- Suppose you just made the number __. Now the app asks you to make the number __. How can you change your 1st number to make the 2nd number?

BUILD: HOW IT WORKS

Choose your category. 10 100 $1.00 0.01 0.001

Tap the hammer symbol for Build mode.

Place cubes to create numbers and solve challenges.



BUILD: SAMPLE CLASSROOM INTRO

Learning Goal: Students will understand how to use the Build activity mode

Key Terms: number puzzles, challenge, limits

Time: 5-20 min

Today we'll be using Cube to solve **number puzzles**. You will make numbers that use a certain amount of cubes. For example, what number can I make with four cubes? *Have student volunteers create different numbers by placing cubes in the tower without using the app. Point out that there are multiple possible answers.*

In the app, tap the Tens/Hundreds/Money/ Hundredths/Thousandths) category. Then tap the hammer symbol for Build mode.

BUILD: SAMPLE CLASSROOM INTRO

You will see a **challenge** on the screen that tells you how many cubes to use. You might be asked to make the smallest possible number, the largest possible number, or to make a number between two **limits.** Give it a try with your partner. After you place your cubes, tap "Check Answer."

Your Notes

BUILD: PROMPTS & DISCUSSION

1. List all of the numbers you can make with five cubes.

2. List all of the numbers between __ and __ that you can make with five cubes.

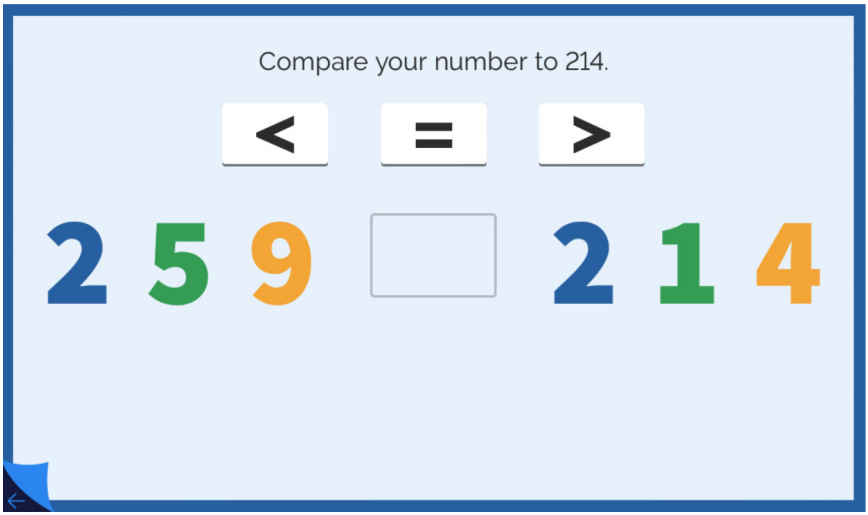
Do you notice anything about the color of Cube's LEDs and the values in the app?

< COMPARE: HOW IT WORKS

Choose your category. 10 100 $1.00 0.01 0.001

Tap the less than symbol < for Compare mode.

Place cubes to make one number, then compare to another number by choosing the correct symbol.



< COMPARE: SAMPLE CLASSROOM INTRO

Learning Goal: Students will understand how to use the Compare activity mode

Key Terms: less than, greater than, equal to

Time: 5-20 min

Today we'll be using Cube to compare numbers. In the app, tap the (Tens/Hundreds/Money/ Hundredths/ Thousandths) category. Then tap the **less than** sign for Compare mode.

First, you'll be asked to make a number. For example, the app is asking me to make a number with __ in the __ place. Have a student volunteer make a number. After you make a number, tap "Check Answer".

< COMPARE: SAMPLE CLASSROOM INTRO

Next, the app asks you to compare your number to another number. Let's compare our number to ____. We will drag in one of these symbols to show whether our number is less than, **greater than**, or **equal to** ___. Have students vote by giving a thumbs up for one of the options. Select the option chosen by most students. Once you have dragged a symbol into place, tap "Check Answer."

Your Notes

< COMPARE: PROMPTS

Work with a partner to make and compare numbers. As you compare numbers, fill out the table below.

Your Number	<, >, or =	App Number	Difference	Sum

List the differences and sums from least to greatest.

NOTE:
Find this printable on our website or ask students to recreate this table on paper or another work surface (mini whiteboard).

< COMPARE: DISCUSSION

- What strategy did you use to compare numbers? How can we combine all of our different strategies into one class strategy? Consider posting the class strategy in the room.

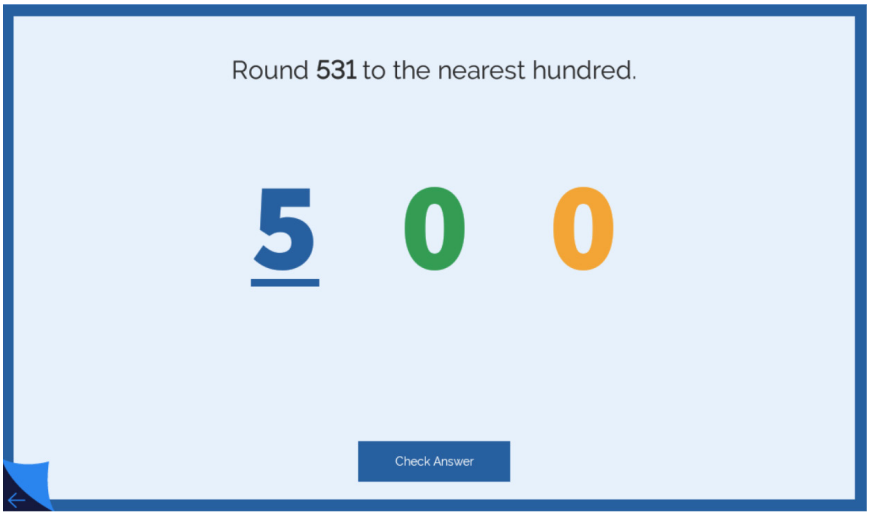
- Struggling students may find it useful to build the comparison number by stacking extra cubes beside the tower.

ROUND: HOW IT WORKS

Choose your category. 10 100 $1.00 0.01 0.001

Tap the round symbol for Round mode.

Place cubes to build the number, and then round the number by adding or removing cubes.



ROUND: SAMPLE CLASSROOM INTRO

Learning Goal: Students will understand how to use the Round activity mode

Key Terms: round

Time: 5-20 min

Today we'll use Cube to round numbers. In the app, tap the (Tens/Hundreds/Money/Hundredths/Thousandths) category. Then tap the symbol with two arrows for Round mode.

The app will ask you to **round** a number. Start by placing cubes to build the number shown. *Have a student volunteer build the number.*

Now we need to add or remove cubes to round this number. What are the two closest (tens/hundreds/etc.) to this number?

ROUND: SAMPLE CLASSROOM INTRO

You may want to draw a number line on the board. Is our number closer to ___ or ___? How can we tell? *The goal is to draw their attention to the place to start for forming their own strategy.*

Now that we've rounded our number, tap "Check Answer."

Your Notes

ROUND: DISCUSSION

- Bring the class together and have pairs share their rounding strategies. Then have students guide you in creating a class strategy on the board or a large sheet of paper.

- Remind students who are struggling to build the number given first, and then round it.

YOU DID IT!

We hope you enjoy bringing Cube into your classroom!

Cube is part of the Owlet Math Tools collection by BirdBrain Technologies. If you enjoy teaching with Cube, we think you'll love Cube's buddy, Glow! Glow complements Cube as a tool for addition, subtraction, multiplication, division, and fractions.

Learn more at www.birdbraintechnologies.com

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