



Cup Shake

Number Sense

Shake the cup, spill the chips, and find every way to decompose your total

 Grades K–1

 10–15 min

 Solo or small group

 Sets A & B

About this activity



What's involved

- Counting a set of chips and keeping the total in mind
- Decomposing a total into a red quantity and a yellow quantity
- Naming a hidden quantity when some of the chips are covered
- Finding every way to decompose a total
- Recording each way and checking for repeats



Why it matters

- Decomposing is a physical move here. Students shake, spill, and see the total decomposed two ways.
- The total never changes, so students learn that moving chips changes the quantities and not the total.
- Hiding some of the chips turns decomposing into a missing-quantity question, the structure behind subtraction.
- Finding every way builds the ordered list students later use for number facts.

The total never changes. Only the quantities change.

Materials & terms



Materials

- Red & yellow chips: 5 per player for Set A, 10 for Set B.
- A small plastic cup, one per group. It holds the chips for shaking and covers them for hiding.
- Recording sheets: Set A on page 10, Set B on page 11. Print one per player.
- A pencil. Snap cubes if you use the cube variation on page 14.

*The DMTI Math Pack includes **red & yellow chips** and **snap cubes** — mathsuccess.io/math-pack*



Terms

total

how many chips in all

quantities

the amounts that compose a total: the red chips and the yellow chips

compose

put quantities together to make a total

decompose

break a total into quantities

hidden quantity

the chips under the cup, named without seeing them

every way

all the decompositions of one total

Shake and spill — solo game



Solo

- 1 Count out the chips for your total and put them in the cup.
- 2 Shake the cup, then spill the chips in front of you.
- 3 Count the red chips and the yellow chips. Say both quantities and the total.
- 4 Record the way you found. If your sheet already shows it, spill again.
- 5 Stop when you have found every way. Check that every row shows your total.



SENTENCE FRAME

“_____ red and _____ yellow compose _____.”



TIP

The total never changes. Only the two quantities change.

Totals: 3, 4, or 5 chips for Set A. 6 to 10 chips for Set B.



What's hiding? — small group

 2–4 players

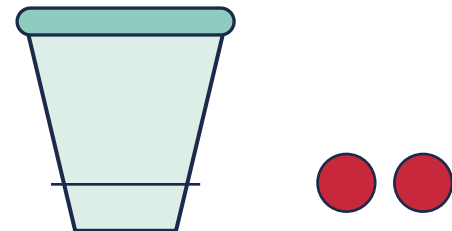
- 1 One player is the hider. Count out the total together and say it aloud.
- 2 The hider covers some chips with the cup and leaves the rest out.
- 3 The other players count the chips they can see, then say how many are hiding.
- 4 Lift the cup and count to check. A correct call scores one point.
- 5 Take turns as the hider. The first player to 5 points wins.

SAY IT

"I see _____.
So _____ are hiding,
because _____ and _____
compose _____."

ASK IT

If you see 3 and the total is 5, how many are hiding? How do you know?



Set A & Set B

Each total has one more way than the total itself, because a spill can land with 0 of one color.

Set A — totals to 5

Total	Ways to find
3	4
4	5
5	6

Start every player here. Five chips in the cup.

Set B — totals 6 to 10

Total	Ways to find
6	7
8	9
10	11

Ten chips in the cup. Totals 7 and 9 work the same way.

Moving between sets

Move a player to Set B once they name both quantities without recounting the entire spill, and once their sheet for 5 shows all six ways in order. Set B players keep the same two jobs: spill and record, then find what is missing.



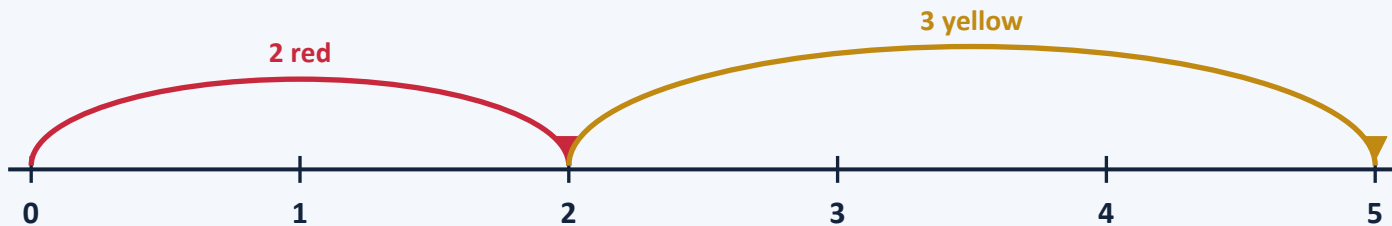
SENTENCE FRAME

"I spilled _____ red and _____ yellow. _____ and _____ compose _____."

See a spill on a number line

Jump the red quantity from 0, then jump the yellow quantity. You always land on the total.

A spill of 5: 2 red and 3 yellow



2 and 3 compose 5. The jumps always end on the total.

Your turn — total 6

Spill 6 chips. Draw your two jumps on this line, then write the numbers.



_____ and _____ compose 6.

See it on a number line

Start at the chips you can see. Count on to the total. The jump is the hidden quantity.

Total 5 — I see 3



I see 3. I counted on to 5. So 2 are hiding.

Total 8 — I see 5



I see _____. I counted on to _____. So _____ are hiding.

Print & play

The pages that follow are the printable components. Print, spill, and you're ready.



Recording sheets

Set A on page 11 and Set B on page 12. Print one per player.



Number line strips

Page 13. Print at actual size (100%) and cut the strips apart.



Cup, chips & tips

A 9 oz plastic cup works well: five chips for Set A, ten for Set B. Slide a sheet into a sleeve for a dry-erase marker.

All the ways — recording sheet

Print one per player. Each table has one row for each way. Record every way you spill.

Name: _____

Total 3

Red	Yellow	Total

Total 4

Red	Yellow	Total

Total 5

Red	Yellow	Total

Say each way as you write it: “_____ and _____ compose _____.” A spill can land with 0 of one color.

All the ways — recording sheet

Print one per player. Each table has one row for each way. For totals 7 and 9, use the rows for 8 and 10.

Name: _____

Total 6

Red	Yellow	Total

Total 8

Red	Yellow	Total

Total 10

Red	Yellow	Total

Say each way as you write it: “_____ and _____ compose _____.” A spill can land with 0 of one color.

Number line strips

Print at actual size (100%) and cut the strips apart. One strip per player.

The first strip counts 0 to 5 for Set A. The second counts 0 to 10 for Set B. The last two are blank, so players label their own. Each space between two ticks is one unit, the same size as one chip, and every jump starts at 0.



Answer key — every way

Teacher or self-check. Order the ways by the red quantity, from 0 up.

Total 3 · 4 ways

Red	Yellow	Total
0	3	3
1	2	3
2	1	3
3	0	3

Total 4 · 5 ways

Red	Yellow	Total
0	4	4
1	3	4
2	2	4
3	1	4
4	0	4

Total 5 · 6 ways

Red	Yellow	Total
0	5	5
1	4	5
2	3	5
3	2	5
4	1	5
5	0	5

Set B

6 has 7 ways · 7 has 8 ways · 8 has 9 ways · 9 has 10 ways · 10 has 11 ways.

Each list runs from 0 red and all yellow up to all red and 0 yellow.

Page 7, Your turn: answers vary. The two jumps must compose 6.

Page 8, Total 8: I see 5. I counted on to 8. So 3 are hiding.

Questions to push thinking

Ask these while students play. Each card names what to listen for.



How many chips are in the cup? How do you know without counting them again?

Listen for: the total named from memory, because no chips went into or out of the set.



You see 2 red. How many are yellow? Say it before you count.

Listen for: counting on from 2 up to the total.



Which way did you spill twice? What helped you spot it?

Listen for: students reading their own recording sheet before writing.



How is 2 red and 3 yellow different from 3 red and 2 yellow?

Listen for: the same total with the quantities traded.



Could you spill 5 chips and get 6 red? Why not?

Listen for: neither quantity can be larger than the total.



Have you found every way for your total? How do you know?

Listen for: an ordered list: 0 red, 1 red, 2 red, and so on up to the total.

Challenge yourself

Stretch the game.

Say it before you spill

Name a way you still need. Spill, and see whether you get it. Keep a tally of how many spills it takes.

Build it with cubes

SWAP THE MEDIUM

Swap the chips for snap cubes. Build the total as one cube train, break it into two trains, and hide one under the cup for a partner to name.

In order

Record the ways in order, from 0 red up to all red. Say what changes and what stays the same from row to row.

Explain the count

Find every way for 10. Tell a partner how you know there are 11 ways and no more.

Exit ticket

Ask each player these two questions at the end of the game, and check what they say.

1. What does decompose mean?

Teacher: check the answer the student says.

- ☐ **A** I do not know.
- ☐ **B** It means to take chips away.
- ☐ **C** It means to break a total apart.
- ☐ **D** It means to break a total into two quantities, like 5 into 2 and 3.

2. Decompose 5 two different ways.

Teacher: check the answer the student says.

- ☐ **A** No way yet.
- ☐ **B** One way: _____ and _____.
- ☐ **C** Two ways that trade the same quantities: 2 and 3, then 3 and 2.
- ☐ **D** Two different ways: _____ and _____, and _____ and _____.

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