

Binary Cards — Printable Set



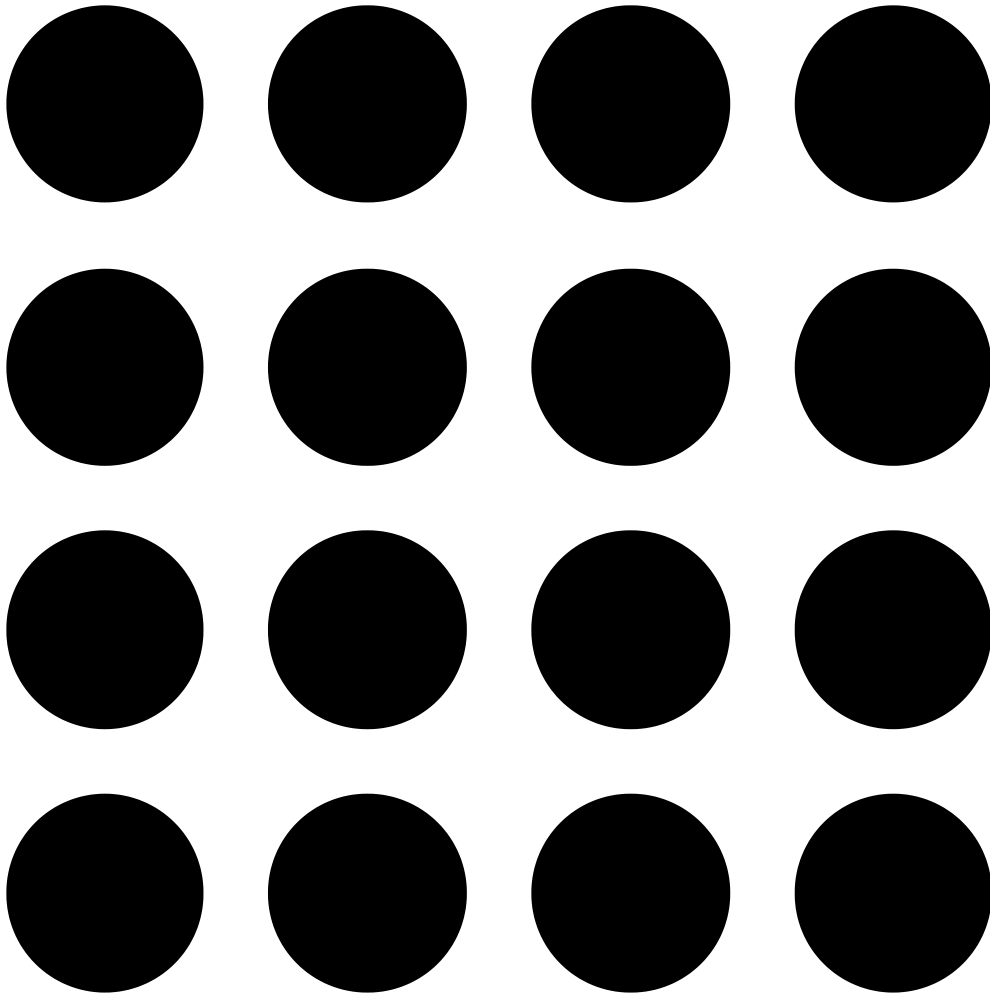
How to use these

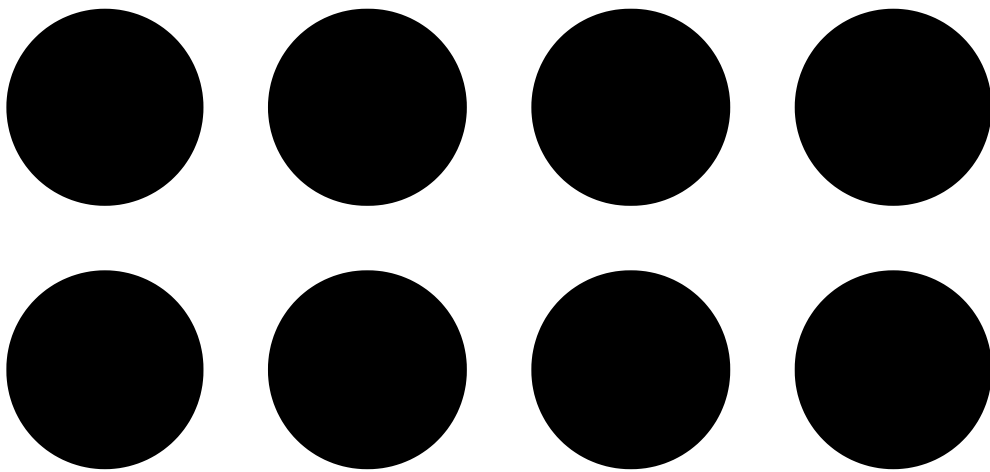
Print pages 1–5 and trim each card to the dashed line. One card per page, so they're big enough to read from the back of the room.

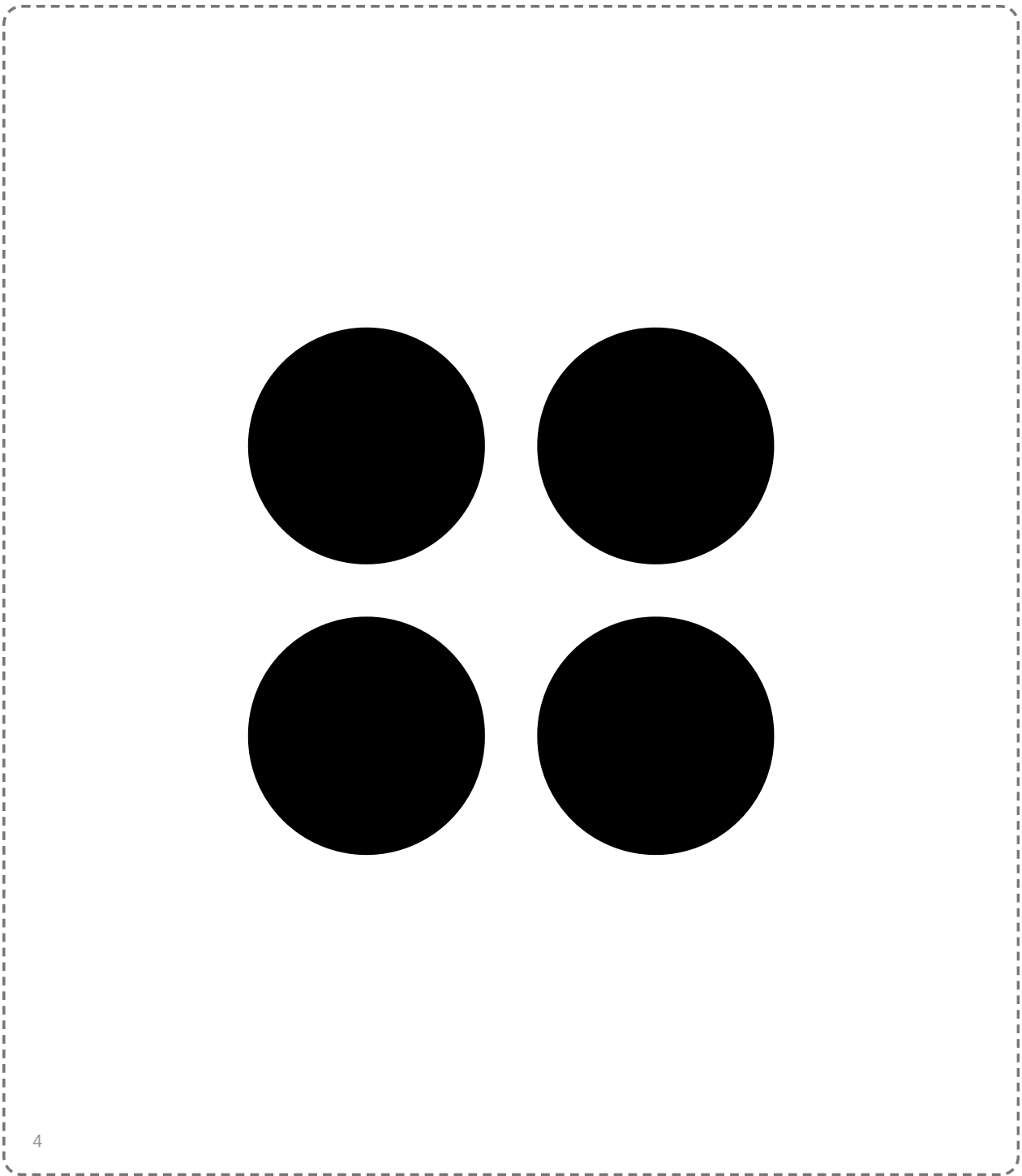
Each card has dots on **one side only** — the back stays blank. Hold them up facing the class; turn a card backward to "switch it off."

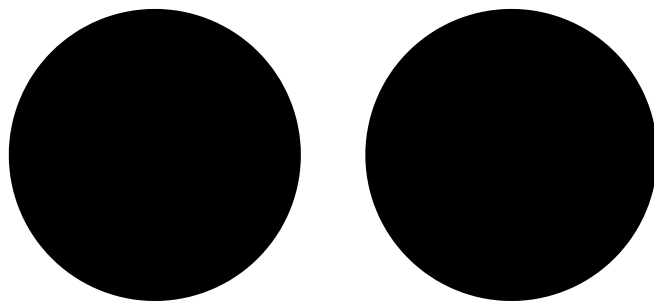
Print order, left to right as the class sees them: **16 · 8 · 4 · 2 · 1**

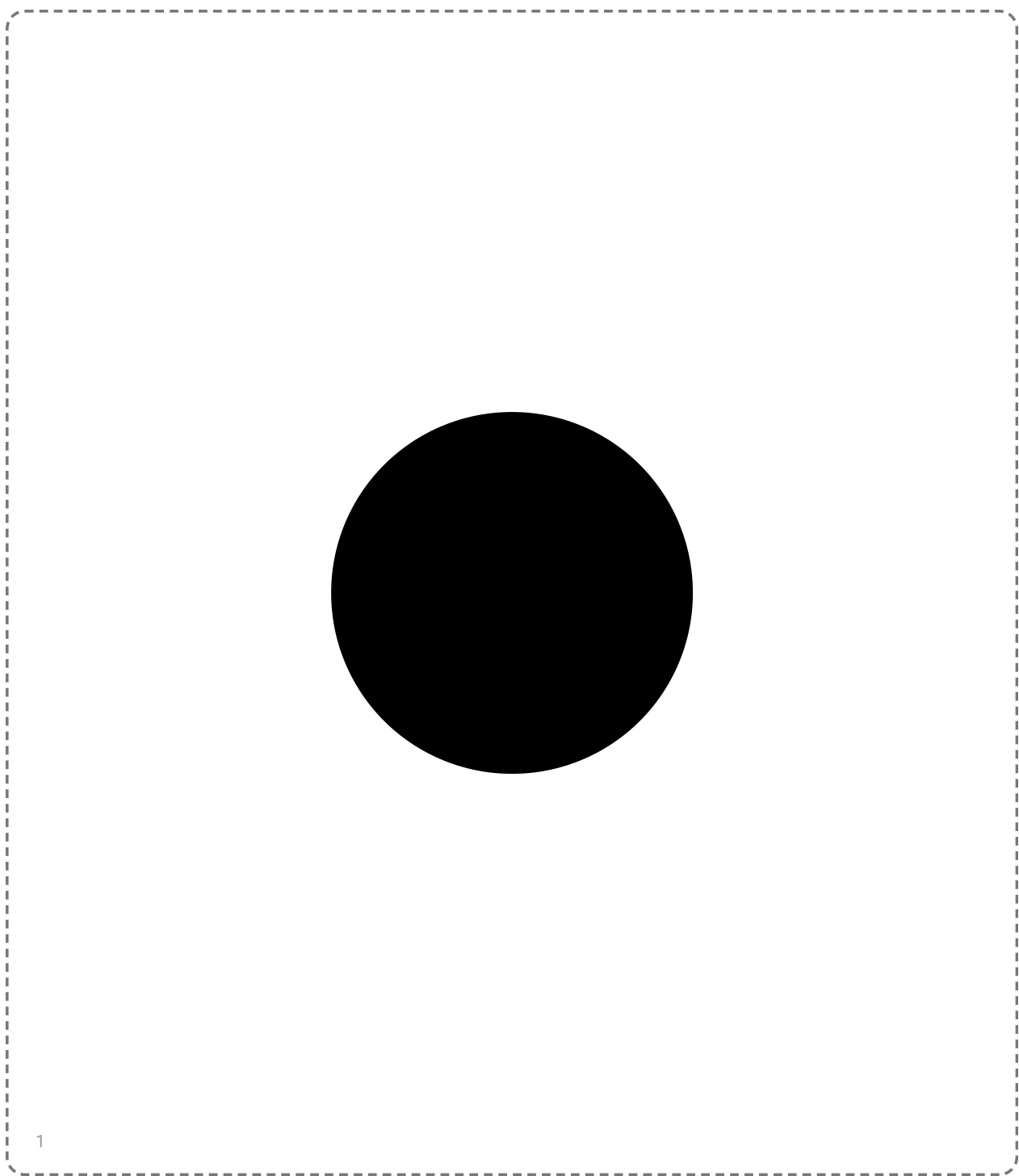
The small number in the corner is for you when sorting the pile — it's too small for students to read from their seats.











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Teacher cheat sheet

Card showing = **1**. Card hidden = **0**.

Number	16	8	4	2	1	Binary
0	X	X	X	X	X	00000
1	X	X	X	X	✓	00001
2	X	X	X	✓	X	00010
3	X	X	X	✓	✓	00011
4	X	X	✓	X	X	00100
5	X	X	✓	X	✓	00101
7	X	X	✓	✓	✓	00111
10	X	✓	X	✓	X	01010
21	✓	X	✓	X	✓	10101
31	✓	✓	✓	✓	✓	11111

Notice the pattern: each card is worth double the one to its right. That is the entire idea.

Questions to ask, in order of difficulty

● Starter (grades 5–6)

- Show me 1. Now 2. Now 3.
- What's the biggest number we can make? (31)
- What's the smallest? (0 – and zero counts!)

● Builder (grades 7–8)

- Show me 21 without counting up to it.
- Why is there no card worth 32 in our set? What would come next? (32, then 64 – each is double)
- How would you show 12? ($8 + 4 = 01100$)

● Extender (grades 9–10)

- How many cards would you need to represent all 26 letters of the alphabet? (5, because $32 > 26$ – this is essentially how ASCII works)
- With 8 cards, how many different values? (256 – that's one byte, and it's why so many things in computing stop at 255)
- Which card decides whether the number is odd or even? (the 1-card, and only the 1-card)

Extension — write your initials in binary

Use A=1, B=2, C=3 ... Z=26. Students write their initials in binary, then trade papers and decode each other's.

Letter	Number	Binary
A	1	00001
E	5	00101
J	10	01010
M	13	01101
S	19	10011
Z	26	11010

 If you want a student set too

Print a second copy of pages 1–5 at 2-up or 4-up so each pair gets a small set to work with at their table. The classroom-sized cards are only needed for the teacher's demonstration.