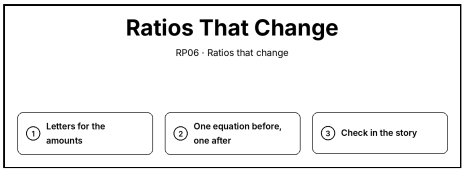
Ratios That Change: teacher script

RP06-V1 · RP06 Ratios that change · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 110 seconds as a video.

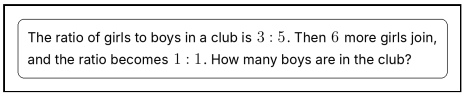
01



Say. Ratios that change. Use letters for the amounts. Write one equation for before and one for after. Then check your answer in the story.

Draw. Write the title “Ratios That Change” and the steps: 1. Letters for the amounts; 2. One equation before, one after; 3. Check in the story.

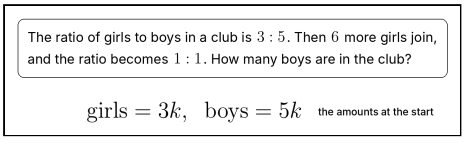
02



Say. The ratio of girls to boys in a club is 3 to 5. Then 6 more girls join, and the ratio becomes 1 to 1. How many boys are in the club?

Draw. Clear the board. Write “The ratio of girls to boys in a club is 3 : 5. Then 6 more girls join, and the ratio becomes 1 : 1. How many boys are in the club?” in a box at the top.

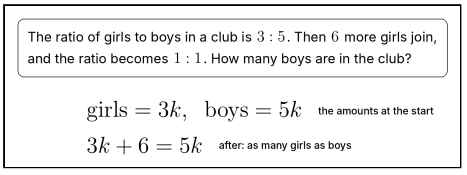
03



Say. Let the girls be 3 times k, and the boys 5 times k, for some number k.

Draw. Write girls = 3k, boys = 5k on the next line. Beside it, write “the amounts at the start”.

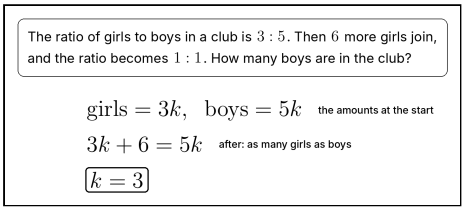
04



Say. After 6 girls join, there are as many girls as boys: 3k + 6 = 5k.

Draw. Write 3k + 6 = 5k on the next line. Beside it, write “after: as many girls as boys”.

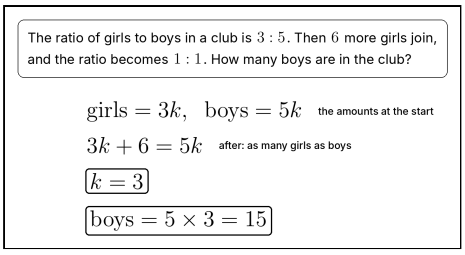
05



Say. So 2k = 6, and k = 3.

Draw. Write k = 3 and box it on the next line.

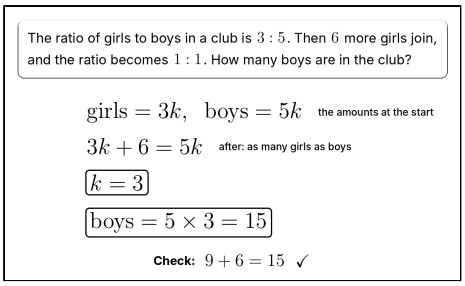
06



Say. The boys are 5 times 3, which is 15.

Draw. Write boys = 5 × 3 = 15 and box it on the next line.

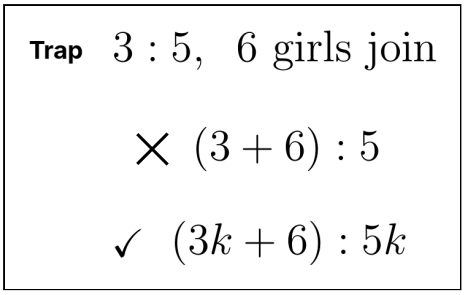
07



Say. Check: 9 girls and 6 more is 15 girls, as many as the boys.

Draw. Below, write “Check: 9 + 6 = 15” and tick it ✓.

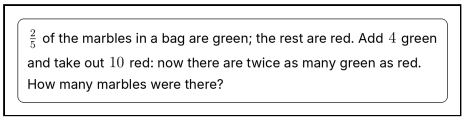
08



Say. Watch for the trap: changing the ratio numbers. 3 and 5 are not the numbers of girls and boys. Change the amounts: 3k + 6.

Draw. Clear the board. Write “Trap” and 3 : 5, 6 girls join. Below, write (3 + 6) : 5 and cross it out ×. Then write (3k + 6) : 5k with a tick ✓.

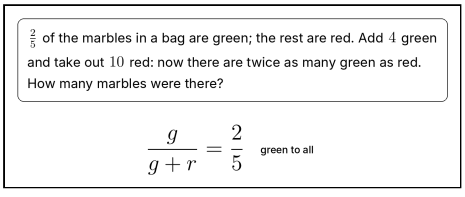
09



Say. Two fifths of the marbles in a bag are green, and the rest are red. Add 4 green and take out 10 red, and now there are twice as many green as red. How many marbles were there?

Draw. Clear the board. Write “2/5 of the marbles in a bag are green; the rest are red. Add 4 green and take out 10 red: now there are twice as many green as red. How many marbles were there?” in a box at the top.

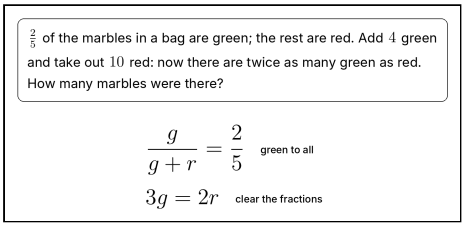
10



Say. Green to all the marbles is two fifths: g over g + r.

Draw. Write g/(g + r) = 2/5 on the next line. Beside it, write “green to all”.

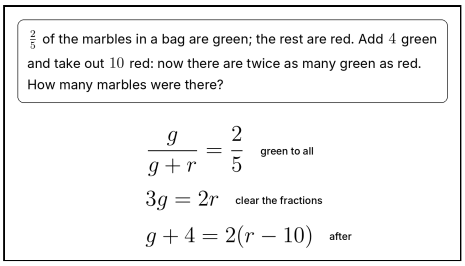
11



Say. Clear the fractions: 5g = 2g + 2r, so 3g = 2r.

Draw. Write 3g = 2r on the next line. Beside it, write “clear the fractions”.

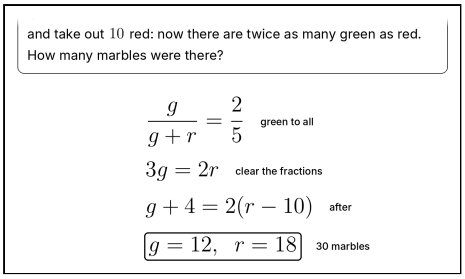
12



Say. After: g + 4 is twice r − 10.

Draw. Write g + 4 = 2(r − 10) on the next line. Beside it, write “after”.

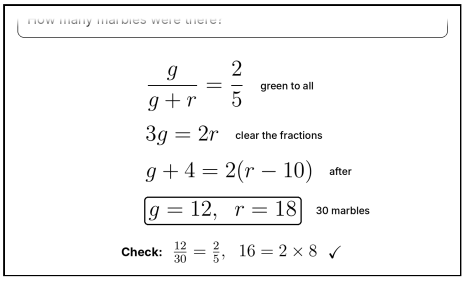
13



Say. Solve the system: 12 green and 18 red, 30 marbles.

Draw. Write g = 12, r = 18 and box it on the next line. Beside it, write “30 marbles”.

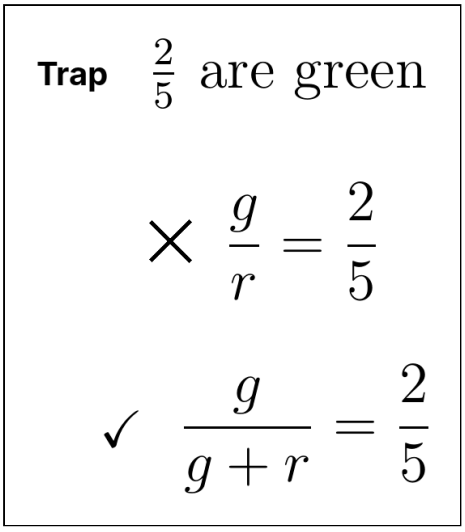
14



Say. Check in the story: 12 out of 30 is two fifths, and 16 is twice 8.

Draw. Below, write “Check: 12/30 = 2/5, 16 = 2 × 8” and tick it ✓.

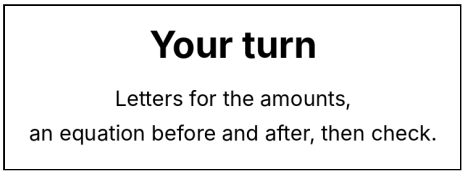
15



Say. Watch for the trap: writing part to whole as part to part. Two fifths compares the green marbles with all the marbles, not with the red ones.

Draw. Clear the board. Write “Trap” and 2/5 are green. Below, write g/r = 2/5 and cross it out ×. Then write g/(g + r) = 2/5 with a tick ✓.

16



Say. Now it is your turn. Use letters for the amounts, write an equation before and after, then check in the story.

Draw. Point to today’s activity: Letters for the amounts, an equation before and after, then check.