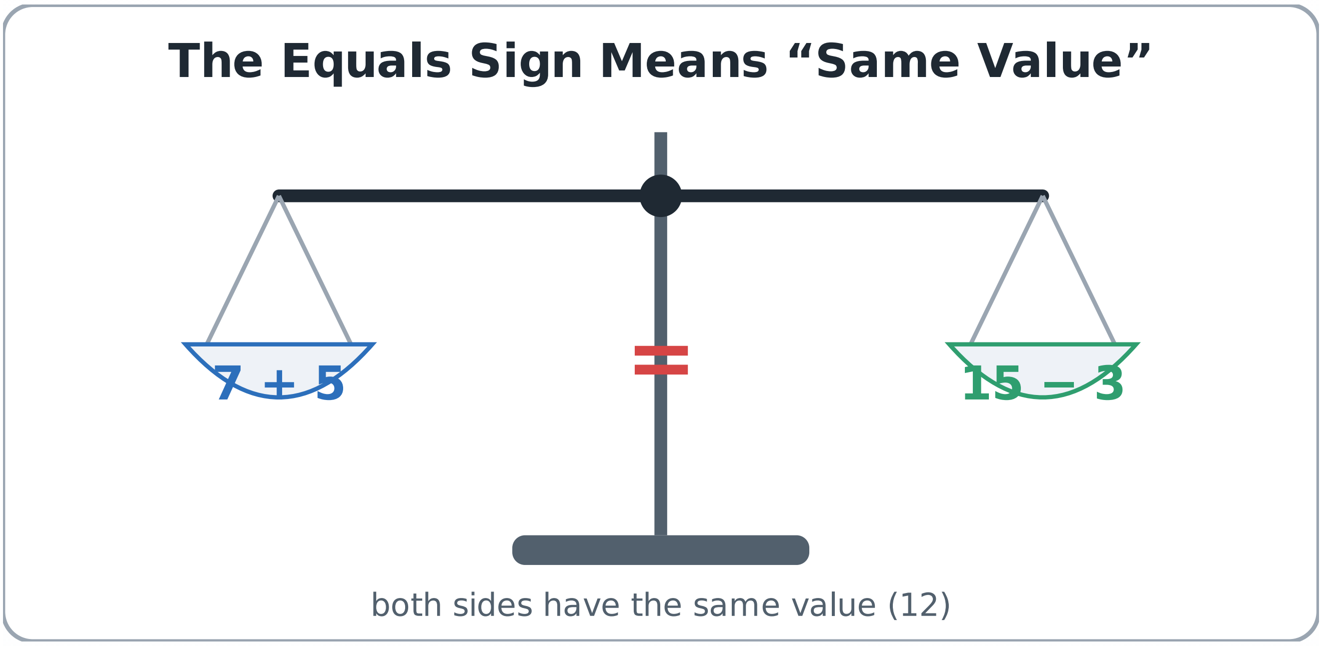
LESSON PLAN

Equalities & Inequalities: Balancing the Four Operations

Explicit teaching — I Do (~15 min)

The big idea of this lesson is that the equals sign expresses a **relationship**, not an instruction to "write the answer". Build everything on the balance model.

1. The equals sign means "the same value" WA6MNAUE1



Both pans hold a value of 12, so the statement $7 + 5 = 15 - 3$ is true.

Model that $7 + 5$ and $15 - 3$ both equal 12, so $7 + 5 = 15 - 3$ is a true statement. Stress that "=" is *not* "the answer comes next".

2. Inequalities

Introduce <, > and ≠. Model $6 \times 3 > 5 \times 3$ and explain why the open mouth of the symbol "points" at the larger side.

3. Order of operations & brackets

> **Worked example.** Compare $3 + 4 \times 2$ with $(3 + 4) \times 2$.
>
> - Without brackets, multiply first: $3 + 8 = 11$.
> - With brackets, do the bracket first: $7 \times 2 = 14$.

Build the convention step by step — brackets, then $\times$ and $\div$, then $+$ and $-$ — rather than just stating a mnemonic.

Guided practice — We Do (~20 min)

1. **True or false?** Display statements (e.g. $8 + 6 = 20 - 6$; $4 \times 5 = 25$; $9 + 3 \neq 15 - 2$). Students vote on whiteboards and justify each.
2. **Fill the gap.** Complete equalities such as $5 \times \square = 30 \div 2$ together.
3. **Brackets matter.** Compute $12 - 2 \times 3$ and $(12 - 2) \times 3$ as a class and discuss why the answers differ.
4. **Build your own.** Pairs construct one true equality and one true inequality, each using at least two operations.

Independent practice — You Do (~15 min)

Students complete the worksheet:

- label statements true or false, correcting the false ones;
- insert $=$, $<$ or $>$ to make statements true;
- evaluate expressions applying the order of operations, with and without brackets;
- construct two of their own true statements using brackets.

> **Exit ticket.** Make $2 + 3 \times 4$ equal 20 by adding one pair of brackets.

Teacher notes

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Curriculum link: WA6MNAUE1.

Materials: a balance scale (real or interactive), true/false statement cards, mini-whiteboards.

Common misconceptions

> - Reading "=" as "write the answer" — the source of running errors like $3 + 4 = 7 \times 2 = 14$. Address this directly with the balance model.
> - Evaluating strictly left to right and ignoring operation priority.
> - Confusing the direction of $<$ and $>$.

Assessment for learning: mini-whiteboard true/false votes give instant whole-class data on who still treats "=" as an operator.

Approaches

VISUAL · VISUAL BALANCE-MODEL APPROACH

Visual balance-model approach

Anchor the abstract "=" in a visual balance model throughout the lesson so that equality is something students can *see*.

Pan balance on the board. Each side holds an expression; the beam tips toward the larger side for an inequality and sits level for an equality.

Colour-code operations. Show multiplication in one colour and addition in another so students see which operation to evaluate first.

Order-of-operations flow. Display a flow diagram: brackets → ×/÷ → +/−, with arrows between stages.

Rearrangeable cards. Provide expression cards students physically place on each pan to test whether the two sides balance.

KINESTHETIC · KINESTHETIC: HUMAN BALANCE & EQUATION CARD SWAPS

Kinesthetic: Human Balance & Equation Card Swaps

This approach lets students *feel* equality and inequality with their bodies and with movable cards, which is powerful for learners who think best through physical action.

Human balance. Two students stand back-to-back linked by a length of rope over a chair (the “pivot”), or simply hold a metre ruler level between them. Hand each side small bean bags representing values. The class calls out which way it should tip and why, then the students lean to model <, = or >.

Equation card swaps. Give each pair a set of expression cards ($7+5$, $15-3$, 6×3, $20\ldots$) and three large symbol cards =, <, >. Students physically place a symbol card between two expressions, then swap one expression and re-test whether the symbol still holds.

Keep-it-fair challenge. Start with a balanced human balance. The teacher adds bean bags to one side; the pair must work out and physically add the matching amount to the other side to restore balance — modelling “do the same to both sides”.

Why it works. Tilting and re-balancing turns the symbols =, <, > into something students physically control, building the intuition that an equation stays true only if both sides change in the same way.