

Fact families: four facts from one picture

CURRICULUM ALIGNMENT

NUM.OPS.2

select, make use of and represent a range of addition and subtraction strategies.

INTERACTIVES

Number Bonds · display

Drag Sort · challenge, explore

WHAT THIS LESSON TEACHES

Two parts and one whole live together in a fact family. They make four number sentences: two adds and two take-aways.

→ 5, 2 and 7 make $5 + 2 = 7$, $2 + 5 = 7$, $7 - 2 = 5$ and $7 - 5 = 2$.

→ In the 5, 2 and 7 family, 7 is the whole.

MODEL THIS ON THE BOARD

THE 5, 2 AND 7 CLASSROOM FAMILY

- 1 The parts are 5 and 2. The whole is 7.
- 2 Add the parts one way: $5 + 2 = 7$.
- 3 Swap the parts: $2 + 5 = 7$.
- 4 Take one part from the whole: $7 - 2 = 5$.
- 5 Take the other part from the whole: $7 - 5 = 2$.

LESSON ARC

Open with the fact-family house on the IWB showing 5, 2 and 7; take three pupil guesses before any facts are written. Model two families live (5-2-7, then 3-6-9), writing the four sentences as the class names them — parts swap for two adds, whole first for two take-aways. Try It Together sorts loose sentences under the matching house. Pupils then write the 5-2-7 family in copybook. Class Challenge is odd-one-out sorting on two houses, checking each answer as they go.

TEACHING MOVES

1. **Getting Started.** Point at the house already showing 5, 2 and 7. Take three answers — listen for any add or take-away named aloud. Do not write the four facts yet; hold that for Watch and Notice.
2. **Watch and Notice.** Work 5 and 2 as parts, 7 as the whole. Write each fact only as the class names it: $5+2=7$, $2+5=7$, $7-2=5$, $7-5=2$. Pause and point: parts swap for two adds; each part comes off the whole for two take-aways. Repeat with 3, 6, 9 — hold out for someone spotting that the whole is written first on every take-away.
3. **Try It Together.** Rotate four pupils at the board. Before each sentence drops, ask the class ‘which house?’ and listen for someone naming the whole first. If a sentence lands under the wrong roof, ask ‘which three numbers does that sentence use?’ — that usually fixes it.
4. **Write the four facts in your copy.** IWB paused. Every pupil writes the four facts for 5, 2 and 7. Walk the rows glancing only at the take-aways — whole must go first. If a pupil stalls, point at the board scaffold (two adds, two take-aways, whole first); do not write the finished sentences for them.
5. **Class Challenge.** Keep it brisk practice: two houses only — 4, 2, 6 then 5, 3, 8. Before each Check, call out ‘which number is the whole — how can you tell?’ If a distractor is dragged in, bounce it and ask which three numbers that sentence really uses.

6. What Did We Notice?. Listen for two adds (parts swap) and two take-aways (each part comes off the whole). Revoice: 'one picture, four facts — because the parts and the whole can be written two ways each.' If someone only names the adds, ask 'what about the take-aways — who goes first on those?'

COMMON MISCONCEPTIONS

⚠ A pupil starts a take-away with a part — writing $5 - 7$ instead of $7 - 5$.

Stop and revoice: 'the whole goes first when we take away.' Point back at the house roof — 7 is biggest, so 7 leads both take-aways. Rebuild the two take-aways with the class naming the whole first each time.

⚠ A pupil drops a sentence under the wrong house because they match one shared number, not the full trio.

Ask: 'which three numbers does that sentence use?' Once they list them, the matching roof is obvious. Have the class say the family aloud before the next drop.

⚠ A pupil treats the whole as just 'the answer on the right' and cannot spot it when the sentence is jumbled or incomplete.

Ask 'which number is biggest?' on the house before any sentence is written. Anchor: the whole is the biggest number in the family — that test works even when the facts are not yet on the board.

DIFFERENTIATION

EMERGING

- Stay with the 5, 2, 7 family only through copybook; supply a blank four-line frame labelled 'add / add / take-away / take-away' so pupils place numbers rather than invent the layout.
- On Try It Together, pre-name the whole for each house out loud before the first sentence drops.

DEVELOPING

- After the copybook four facts, cover one number on the house and ask which fact-family sentences still fix the missing number.
- On Class Challenge, after both houses are clean, ask why a near-miss distractor (right digits, wrong whole-first order) cannot live in that house.

PROFICIENT

- Narrate a stretch house from the front — 6, 4, 10 — and have them write the four facts in copybook while the class finishes the main two houses.
- Pose: 'the whole is 12 and one part is 7 — build the full family.' They find the missing part, then write all four facts.

ANSWER KEY

Q1: $7 + 2 = 9$, $2 + 7 = 9$, $9 - 2 = 7$, $9 - 7 = 2$

Q2: $6 + 4 = 10$, $4 + 6 = 10$, $10 - 4 = 6$, $10 - 6 = 4$

Q3: $3 + 4 = 7$, $4 + 3 = 7$, $7 - 4 = 3$, $7 - 3 = 4$

Q4: $12 + 8 = 20$, $8 + 12 = 20$, $20 - 8 = 12$, $20 - 12 = 8$

Q5: $9 + 6 = 15$, $6 + 9 = 15$, $15 - 6 = 9$, $15 - 9 = 6$

Q6: $11 + 7 = 18$, $7 + 11 = 18$, $18 - 7 = 11$, $18 - 11 = 7$

a) Always : Two parts and one whole always make exactly four facts: two adds and two take-aways.

b) Always : The whole is always the largest number and is written first in each take-away.

c) Never : The whole must come first when we take away; a part never comes first.

d) Never : $5 - 2$ equals 3, not 7, so that sentence does not belong in the family.

EXTENSION SHEET · STRETCH ANSWERS

S1: 5

S2: 5

S3: 5

S4: 3