Early Additive Stage

Lisa solves the problem 9 + 6 by working out 10 + 5 = 15.
She also solves 7 + 48 by working out 5 + 50.

1. How would Lisa use the same strategy to solve these problems?

   5 + 8 37 + 6 8 + 299 996 + 456

2. Lisa knows that these equations are correct or incorrect without working out the answers. Which equations are correct?

   6 + 8 = 10 + 12 10 + 4 = 9 + 5

   78 + 8 = 80 + 10 100 + 24 = 97 + 27

   247 + 988 = 259 + 1000 348 + 52 = 350 + 50

3. Use Lisa's strategy to find the number that goes in each box:

   10 + 3 = ☐ + 7 30 + ☐ = 28 + 5

   87 + 24 = 90 + ☐ ☐ + 245 = 300 + 242

   789 + 94 = 800 + ☐ 5000 + ☐ = 4998 + 666

4. What numbers go in each shaped box to make these equations true?

   28 + ☐ = 30 + Δ ❍ + 749 = ◇ + 746

5. What is always true about the numbers that go in the different shapes?

   196 + ◆ = 200 + ✶ ♣ + 357 = 370 + ✡

6. Lisa uses letters instead of numbers. What goes in each empty box?
   m + 48 = ☐ + 50 296 + ☐ = p + 300 ☐ + 85 = 100 + w

Advanced Additive Stage

Kahu solves the problem 82 - 48 by working out 84 - 50 = 34.
He also solves 452 - 239 by working out 453 – 240 = 213.

1. How would Kahu use the same strategy to solve these problems?

   91 - 69 114 - 58 836 - 377

2. Kahu knows that these equations are correct or incorrect without working out the answers. Which equations are correct?

   74 - 28 = 76 - 30 92 - 56 = 88 - 60

   143 – 85 = 158 - 100 904 - 168 = 902 - 170

   417 - 195 = 422 - 200 1123 - 483 = 1140 - 500

3. Use Kahu's strategy to find the number that goes in each box:

   32 - 19 = ☐ - 20 73 - ☐ = 76 - 30

   262 - 128 = 264 - ☐ ☐ - 245 = 519 - 250

   2006 - 997 = 2009 - ☐ 3333 - ☐ = 3359 - 800

4. What numbers go in each shaped box to make these equations true?

   ❍ - 37 = ◇ - 50 832 - ☐ = 843 - Δ

5. What is always true about the numbers that go in the different shapes?
   ♣ - 57 = ✡ - 60 777 - ◆ = 800 - ✶

6. Kahu uses letters instead of numbers. What goes in each empty box?
   ☐ - 95 = j – 100 v - 284 = ☐ - 300 397 - p = 404 - ☐

Advanced Multiplicative Stage

Zane solves the problem 64 ÷ 4 by working out (64 ÷ 8) × 2 = 16.
He also solves 81 ÷ 3 by working out (81 ÷ 9) × 3 = 27.

1. How would Zane use the same strategy to solve these problems?

   56 ÷ 4 72 ÷ 3 330 ÷ 5 450 ÷ 25

2. Zane knows that these equations are correct or incorrect without working out the answers.
   Which equations are correct?

   56 ÷ 4 = (56 ÷ 8) × 2 (108 ÷ 9) × 3 = 108 ÷ 3

   (370 ÷ 10) × 2 = 370 ÷ 20 4700 ÷ 25 = (4700 ÷ 100) × 4

3. Use Zane's strategy to find the number that goes in each box:

   48 ÷ 3 = (48 ÷ 6) × ☐ (96 ÷ 12) × 3 = 96 ÷ ☐

   (228 ÷ ☐) × 3 = 228 ÷ 2 738 ÷ 3 = (738 ÷ 18) × ☐

4. What numbers go in each shaped box to make these equations true?

   (72 ÷ ☐) × 2 = 72 ÷ △ 1440 ÷ ❍ = (1440 ÷ 36) × ✡

5. What is always true about the numbers that go in the different shapes?

   (256 ÷ △) × 3 = 72 ÷ ❍ 504 ÷ ☐ = (1008 ÷ 4) × ✡

6. Zane uses letters instead of numbers. What goes in each empty box?

   (648 ÷ 6) × ☐ = 648 ÷ *k* 512 ÷ *n* = (512 ÷ ☐) × 8

   (625 ÷ *y*) × 5 = 625 ÷ ☐ 1000 ÷ 25 = (1000 ÷ ☐) × *z*

Advanced Proportional Stage

Pene simplifies $\frac{18}{24}$ and 18:24 by knowing that $\underline{3} \times 6 = 18$ and $\underline{4} \times 6 = 24$, so $\frac{18}{24} = \frac{3}{4}$ and 18:24 = 3:4.

She also simplifies $\frac{21}{30}$ to $\frac{7}{10}$, and 21:30 to 7:10.

1. How would Pene use the same strategy to simplify these fractions and ratios?

   15:40 $\frac{14}{21}$ $\frac{64}{72}$ 27:63

2. Pene uses her strategy to decide which of these equations are correct or incorrect. Which equations are correct?

   $\frac{20}{24} = \frac{5}{6}$ 16:27 = 5:9

   2:3 = 22:33 $\frac{5}{7} = \frac{15}{21}$

   $\frac{333}{1000} = \frac{1}{3}$ 42:36 = 7:6

3. Use Pene's strategy to find the number that goes in each box:

   4:9 = □:45 $\frac{\square}{18} = \frac{24}{9}$

   $\frac{63}{81} = \frac{7}{\square}$ 64:24 = 8:□

4. What numbers go in each shaped box to make these equations true?

   Δ : 49 = ❍ : 7 $\frac{7}{\hexagon} = \frac{28}{\triangleright}$

5. What is always true about the numbers that go in the different shapes?

   ❍ : 100 = ◇ : 25 $\frac{56}{\triangle} = \frac{8}{\pentagon}$

6. Pene has used letters instead of numbers. What goes in each empty box?

   □ : 51 = *b* : 17 $\frac{14}{f} = \frac{7}{\square}$ 6: □ = *j* : 15