Red

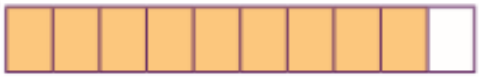
1) Children have been adding together 3 fractions.

$$\frac{4}{12} + \frac{3}{12} + \frac{2}{12}$$

Half of these representations show the correct answer.

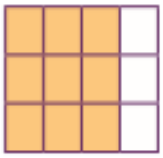
Ingrid

A



B $\frac{12}{9}$

C



D $\frac{9}{36}$

E

F $\frac{8}{12}$

Is Ingrid correct? For the representations that don't show the correct answer, explain what could have gone wrong.

2) 2 children are given tennis balls during sports practice. Each child is given an odd number of balls.

How many number sentences can you think of that show the number of tennis balls that each child was given?

$$\frac{\square}{\square} + \frac{\square}{\square} = \frac{12}{12}$$

3) Jim says it is impossible for both missing numerators to be even numbers.

Is Jim correct? Explain with reasoning.

$$\frac{1}{\square} + \frac{\square}{15} + \frac{5}{\square} + \frac{\square}{15} = \frac{13}{15}$$

1) Ingrid is incorrect as only C and E show the correct answer.

$\frac{4}{12} + \frac{3}{12} + \frac{2}{12} = \frac{9}{12}$

For explaining what went wrong, here are some possible answers:

A shows $\frac{9}{10}$ so the denominator is not big enough.

B shows $\frac{12}{9}$ so it is possible the numerator and denominator were written the wrong way round.

D shows $\frac{9}{36}$ so this child has added the denominators together when they didn't need to.

F shows $\frac{8}{12}$ so this child has miscalculated when adding the numerators together.

2) These are all the possible answers:

$\frac{1}{12} + \frac{11}{12} = \frac{12}{12}$

$\frac{3}{11} + \frac{9}{11} = \frac{12}{12}$

$\frac{5}{11} + \frac{7}{11} = \frac{12}{12}$

$\frac{7}{11} + \frac{5}{11} = \frac{12}{12}$

$\frac{9}{11} + \frac{3}{11} = \frac{12}{12}$

$\frac{11}{11} + \frac{1}{11} = \frac{12}{12}$

3) Jim is correct. In the number sentence, one of the missing numerators is an even number and one of them is an odd number.

$\frac{1}{\mathbf{15}} + \frac{\mathbf{1}}{15} + \frac{5}{\mathbf{15}} + \frac{\mathbf{6}}{15} = \frac{13}{15}$ $\qquad$ $\frac{1}{\mathbf{15}} + \frac{\mathbf{5}}{15} + \frac{5}{\mathbf{15}} + \frac{\mathbf{2}}{15} = \frac{13}{15}$

$\frac{1}{\mathbf{15}} + \frac{\mathbf{2}}{15} + \frac{5}{\mathbf{15}} + \frac{\mathbf{5}}{15} = \frac{13}{15}$ $\qquad$ $\frac{1}{\mathbf{15}} + \frac{\mathbf{6}}{15} + \frac{5}{\mathbf{15}} + \frac{\mathbf{1}}{15} = \frac{13}{15}$

$\frac{1}{\mathbf{15}} + \frac{\mathbf{3}}{15} + \frac{5}{\mathbf{15}} + \frac{\mathbf{4}}{15} = \frac{13}{15}$ $\qquad$ $\frac{1}{\mathbf{15}} + \frac{\mathbf{4}}{15} + \frac{5}{\mathbf{15}} + \frac{\mathbf{3}}{15} = \frac{13}{15}$