Answers - Equivalent fractions and comparing fractions

Year: Year 3

Answer to Question 1

a. The bar has 4 equal parts and 1 is shaded. The denominator counts the equal parts and the numerator counts the shaded ones: $\frac{1}{4}$.
b. The bar has 8 equal parts and 3 are shaded, so the fraction is $\frac{3}{8}$ (three eighths).
c. The bar has 5 equal parts and 2 are shaded, so the fraction is $\frac{2}{5}$ (two fifths).
d. The bar has 10 equal parts and 7 are shaded, so the fraction is $\frac{7}{10}$ (seven tenths).

Answer to Question 2

a. Each half of the top bar covers 2 quarters of the bottom bar. So $\frac{1}{2} = \frac{2}{4}$ and the missing number is **2**. Both the numerator and the denominator were doubled.
b. One third of the bar lines up with 2 sixths. So $\frac{1}{3} = \frac{2}{6}$: the missing number is **2** (1 × 2 = 2 and 3 × 2 = 6).
c. Each quarter splits into 2 eighths, so 3 quarters make 3 × 2 = 6 eighths. $\frac{3}{4} = \frac{6}{8}$: the missing number is **6**.

Answer to Question 3

a. $\frac{1}{2} = \frac{3}{6}$: 1 × 3 = 3 and 2 × 3 = 6.
b. $\frac{1}{3} = \frac{4}{12}$: 1 × 4 = 4 and 3 × 4 = 12.
c. $\frac{2}{5} = \frac{4}{10}$: 2 × 2 = 4 and 5 × 2 = 10.
d. $\frac{3}{4} = \frac{6}{8}$: 3 × 2 = 6 and 4 × 2 = 8.
e. $\frac{1}{5} = \frac{2}{10}$: 1 × 2 = 2 and 5 × 2 = 10.

Answer to Question 4

a. 2 × 5 = 10, so 1 × 5 = **5**.
b. 3 × 3 = 9, so 2 × 3 = **6**.
c. 4 ÷ 2 = 2, so 8 ÷ 2 = **4**.
d. 6 ÷ 2 = 3, so 10 ÷ 2 = **5**.

Answer to Question 5

a. $\frac{3}{8} < \frac{5}{8}$ (same denominator: compare numerators)
b. $\frac{2}{9} < \frac{7}{9}$ (same denominator: compare numerators)
c. $\frac{1}{4} > \frac{1}{6}$ (same numerator: the bigger denominator is the smaller fraction)
d. $\frac{1}{3} > \frac{1}{10}$ (same numerator: the bigger denominator is the smaller fraction)
e. $\frac{4}{5} > \frac{2}{5}$ (same denominator: compare numerators)

Answer to Question 6

a. $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$. The denominator stays 7.
b. $\frac{4}{9} + \frac{2}{9} = \frac{6}{9}$. The denominator stays 9.
c. $\frac{6}{7} - \frac{2}{7} = \frac{4}{7}$. The denominator stays 7.
d. $\frac{5}{10} - \frac{4}{10} = \frac{1}{10}$. The denominator stays 10.

Answer to Question 7

a. $\frac{4}{8} = \frac{1}{2}$.
b. $\frac{2}{4} = \frac{1}{2}$.
c. They eat **the same amount**: $\frac{4}{8} = \frac{2}{4}$ = half a pizza.
d. $\frac{3}{8}$ and $\frac{2}{4} = \frac{4}{8}$. 4 eighths is more than 3 eighths, so **Zack** ate more.

Answer to Question 8

a. $\frac{3}{10}$.
b. $\frac{5}{10} = \frac{1}{2}$.
c. $\frac{3}{10} + \frac{5}{10} = \frac{8}{10}$.
d. 3 + 5 + 1 = 9 eaten, so $\frac{1}{10}$ is left. Check: 10 − 9 = 1 square, $\frac{1}{10}$.

Answer to Question 9

a. 5 of the 12 equal slices are eaten before tea, so the fraction is $\frac{5}{12}$.
b. 4 of the 12 slices are eaten at tea time: $\frac{4}{12}$, which is the same as $\frac{1}{3}$.
c. The denominators are the same, so add the numerators: $\frac{5}{12} + \frac{4}{12} = \frac{9}{12}$ of the cake has been eaten.
d. 12 − 9 = 3 slices are left, which is $\frac{3}{12}$. 3 slices is a quarter of 12, so $\frac{3}{12} = \frac{1}{4}$: **a quarter** of the cake is left.

Answer to Question 10

a. $\frac{1}{2}$.
b. 2 quarters = 1 half, so **2** pieces.
c. 4 eighths = 1 half, so **4** pieces.
d. $\frac{1}{4} = \frac{2}{8}$. 3 eighths is more than 2 eighths, so **yes**, she is right.

Answer to Question 11

a. 6 out of 12 apples is $\frac{6}{12}$. Divide the numerator and denominator by 6: $\frac{6}{12} = \frac{1}{2}$.
b. 4 out of 12 is $\frac{4}{12}$. Divide both numbers by 4: $\frac{4}{12} = \frac{1}{3}$.
c. 2 out of 12 is $\frac{2}{12}$. Divide both numbers by 2: $\frac{2}{12} = \frac{1}{6}$.
d. For unit fractions, the bigger the denominator, the smaller the fraction. So the order is $\frac{1}{6}, \frac{1}{3}, \frac{1}{2}$, and the **first pack** has the biggest share (6 apples).

Answer to Question 12

a. Change to eighths: Dan has $\frac{3}{4} = \frac{6}{8}$, Ben has $\frac{1}{2} = \frac{4}{8}$. The numerators are 7, 4, 5 and 6, so **Aisha** ran the furthest.
b. $\frac{1}{2} = \frac{4}{8}$, which is the smallest. **Ben**.
c. $\frac{7}{8} - \frac{6}{8} = \frac{1}{8}$.
d. $\frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}$. Order: **Ben, Cara, Dan, Aisha**.

Answer to Question 13

a. 8 of the 10 equal parts are full in the morning: $\frac{8}{10}$ of the tank.
b. 5 of 10 parts are full at lunchtime: $\frac{5}{10}$. Five is half of ten, so another name is $\frac{1}{2}$.
c. The tank went from 8 tenths to 5 tenths: $\frac{8}{10} - \frac{5}{10} = \frac{3}{10}$ was used.
d. **Yes**, he is right. Half the tank is $\frac{5}{10}$, and $\frac{3}{10} < \frac{5}{10}$, so he used less than half.

Answer to Question 14

a. English takes 2 of the 8 sessions: $\frac{2}{8}$. Divide both numbers by 2 to get $\frac{1}{4}$, a quarter of the day.
b. Maths and science together use 2 + 1 = 3 sessions: $\frac{2}{8} + \frac{1}{8} = \frac{3}{8}$.
c. The whole day is $\frac{8}{8}$. Break and lunch take $\frac{1}{8}$, so $\frac{8}{8} - \frac{1}{8} = \frac{7}{8}$ is left for lessons.
d. Half of 8 sessions is 4 sessions. 4 is more than 3, so half the day is **more** than 3 sessions.

Answer to Question 15

a. Lily $\frac{3}{4}$, Omar $\frac{4}{6}$, Ravi $\frac{5}{8}$, Sara $\frac{6}{10}$.
b. $\frac{3}{4} = \frac{6}{8}$, and $\frac{6}{8} > \frac{5}{8}$, so **Lily** eats more.
c. No. The slices are different sizes. $\frac{5}{8} < \frac{6}{8} = \frac{3}{4}$. Eighths are smaller than quarters. So **Ravi is wrong**.
d. $6 - 4 = 2$ slices left. $\frac{2}{6} = \frac{1}{3}$.

Answer to Question 16

a. $\frac{4}{8} = \frac{1}{2}$. The answer is $\frac{4}{8}$.
b. $\frac{2}{8} = \frac{1}{4}$ and $\frac{6}{8} = \frac{3}{4}$.
c. Eighths: $\frac{4}{8}$, $\frac{3}{8}$, $\frac{6}{8}$, $\frac{2}{8}$. Order: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$.
d. $\frac{1}{2} = \frac{4}{8}$ and $\frac{3}{4} = \frac{6}{8}$. 5 is between 4 and 6, so **yes**.

Answer to Question 17

a. Lanes 1, 2 and 3 are for beginners: 3 of the 10 lanes, which is $\frac{3}{10}$.
b. Lanes 4, 5 and 6 are for improvers: 3 lanes, so $\frac{3}{10}$ again.
c. Lanes 7, 8, 9 and 10 are 4 lanes: $\frac{4}{10}$. A third of 10 lanes would be 3 and a bit lanes, and 4 is more than that, so $\frac{4}{10}$ is **more** than a third.
d. Beginners and improvers use $\frac{3}{10} + \frac{3}{10} = \frac{6}{10}$. Divide the numerator and denominator by 2: $\frac{6}{10} = \frac{3}{5}$.

Answer to Question 18

a. The numerator was doubled (1 to 2) but the denominator went from 3 to 5, not 6. **Wrong**: $\frac{1}{3} = \frac{2}{6}$.
b. $\frac{3}{4} = \frac{6}{8}$ and $6 > 5$. **Right**.
c. Add numerators only: $2 + 3 = 5$. The denominator stays 9. **Wrong**: $\frac{5}{9}$.
d. The bigger denominator gives the smaller fraction. **Wrong**: $\frac{1}{6} < \frac{1}{4}$.

Answer to Question 19

a. Roses $\frac{3}{12}$, tulips $\frac{4}{12}$, herbs $\frac{2}{12}$.
b. $\frac{3}{12} = \frac{1}{4}$, $\frac{4}{12} = \frac{1}{3}$, $\frac{2}{12} = \frac{1}{6}$.
c. $12 - (3 + 4 + 2) = 3$ beds. $\frac{3}{12} = \frac{1}{4}$.
d. Both are $\frac{3}{12}$, so they are **equal**.

Answer to Question 20

a. $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{5}{10}$.
b. $\frac{1}{2} = \frac{4}{8}$ and $\frac{3}{4} = \frac{6}{8}$. Between 4 and 6 comes 5, so $\frac{5}{8}$ is between them.
c. No. The only whole number between 4 and 6 is 5, so $\frac{5}{8}$ is the only eighth between $\frac{1}{2}$ and $\frac{3}{4}$.