ThemeVille™ Math

See the themes behind the details

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ThemeVille Math 4
Worktext

Second Edition

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Sample page

Contents

*The first and second page numbers are for pre-lesson and lesson respectively.

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Fractions - Introduction

Fill in the blanks:

1

$\frac{1}{2}$	$\frac{\square}{\square}$

1 is divided in 2 parts.

Each part is $\frac{1}{2}$ → *One half*

1

$\frac{1}{3}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$
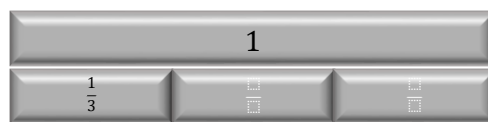
...... is divided in ...... parts.

Each part is $\frac{\square}{\square}$ → *One third*

1

$\frac{1}{4}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$
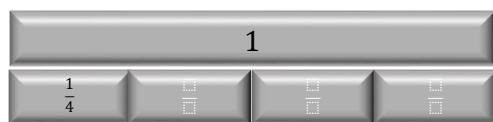
...... is divided in ...... parts.

Each part is $\frac{\square}{\square}$ → *One fourth*

1

$\frac{1}{5}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$

...... is divided in ...... parts.

Each part is $\frac{\square}{\square}$ → *One fifth*

1
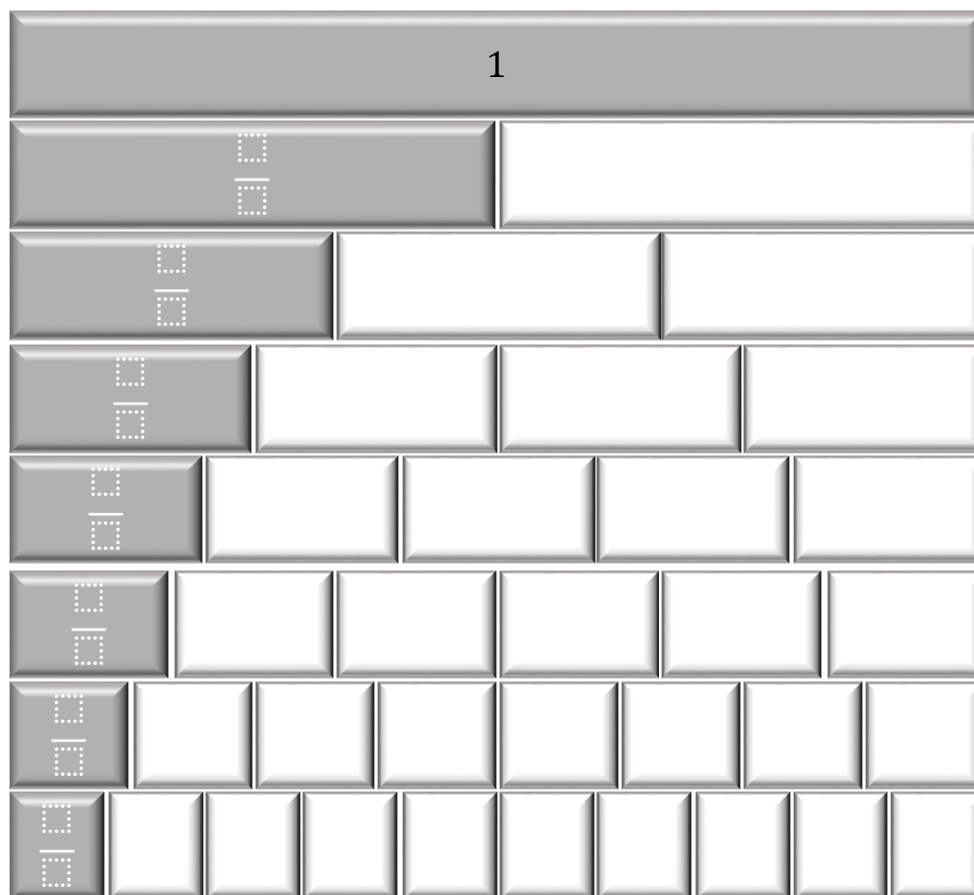
Fraction notation: $\frac{1}{4}$ ← Numerator
← Denominator

	$\frac{1}{4}$	$\frac{\square}{\square}$
$\frac{\square}{\square}$	$\frac{\square}{\square}$	$\frac{\square}{\square}$

1
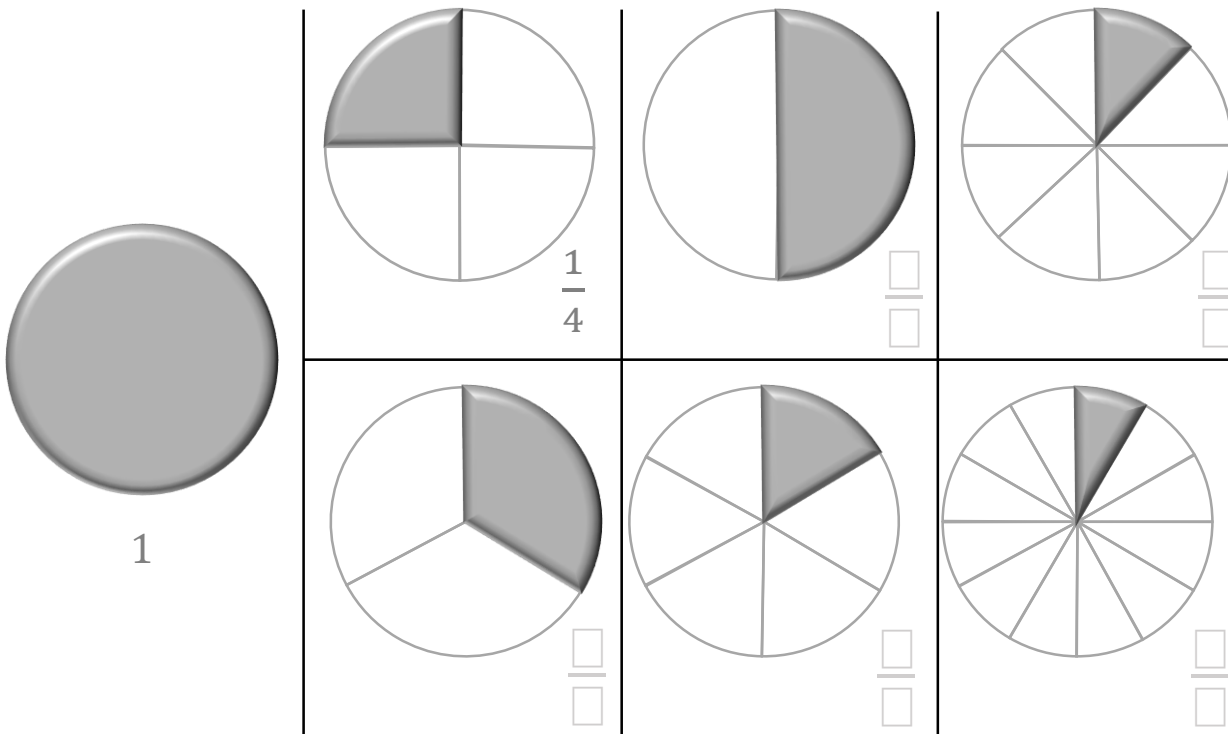
Write as fractions	Write in words
One fifth → $\frac{1}{5}$	$\frac{1}{6}$ → One sixth
One eighth →	$\frac{1}{3}$ →
One half →	$\frac{1}{5}$ →
One third →	$\frac{1}{8}$ →
One tenth →	$\frac{1}{12}$ →
One fourth →	$\frac{1}{10}$ →
One ninth →	$\frac{1}{4}$ →
One twelfth →	$\frac{1}{6}$ →

To the Teacher: After filling in answers for few problems, please ask the student to show with rectangular and circular tiles.

Addition of fractions

| 1 |

| $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ |

Numerators are added.

$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

| $\frac{2}{3}$ | $\frac{2}{3}$ | $\frac{2}{3}$ |

Denominator stays the same.

| 2 |

Fill the number lines:

$\leftarrow$ —————————————————— $\rightarrow$
0            $\frac{1}{2}$ 1

$\leftarrow$ —————————————————— $\rightarrow$
0     $\frac{1}{3}$ $\frac{2}{3}$ 1

$\leftarrow$ —————————————————— $\rightarrow$
0     $\frac{1}{5}$ $\frac{2}{5}$ $\frac{3}{5}$ $\frac{\square}{\square}$ 1

$\leftarrow$ —————————————————— $\rightarrow$
0   $\frac{1}{7}$ $\frac{2}{7}$ $\frac{3}{7}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ 1
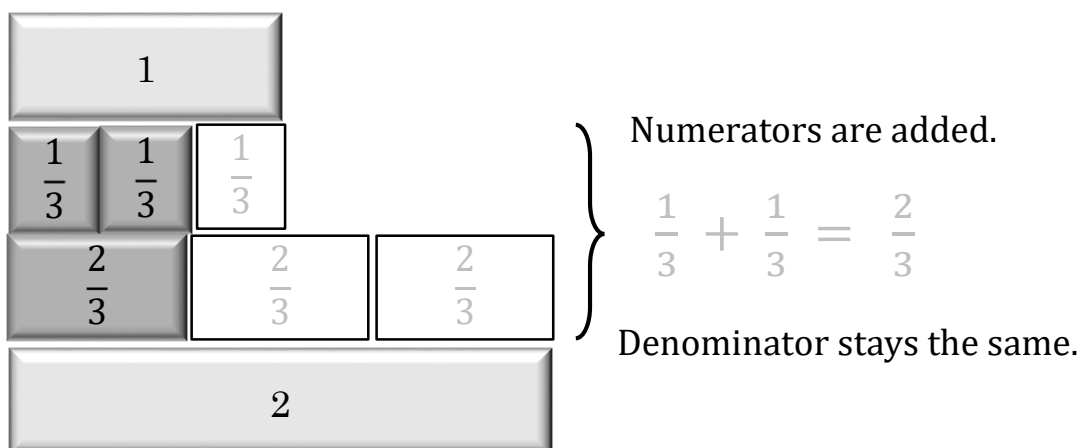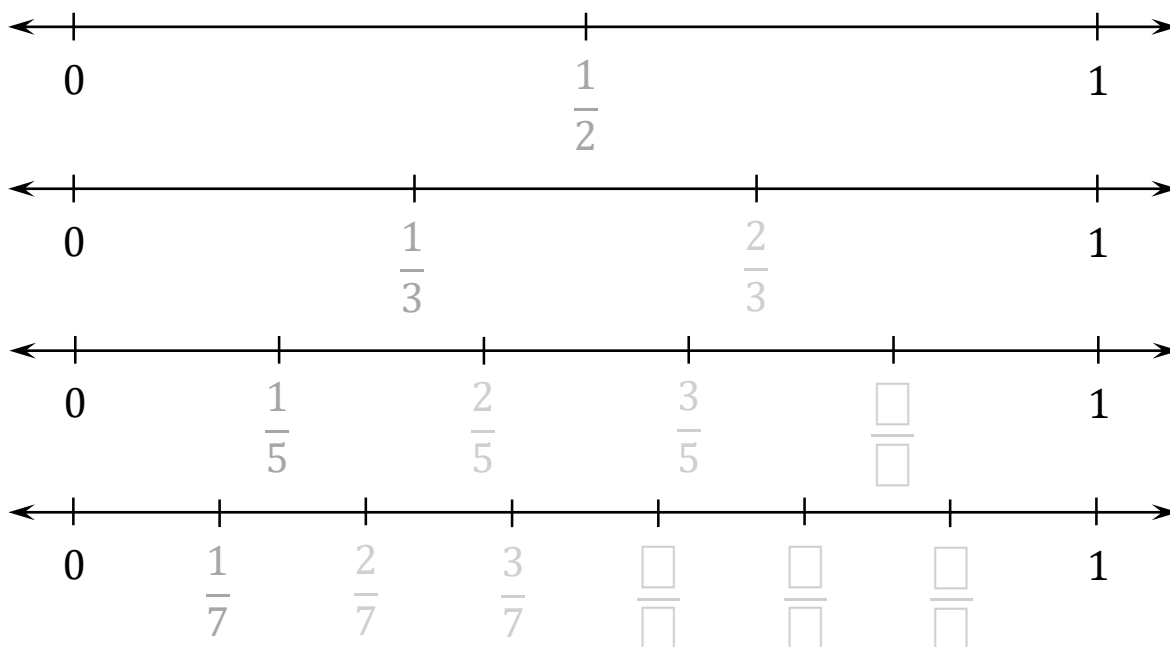
Add the following fractions and show with hops on the number line:

$$\frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{3}{7}$$

$\frac{1}{7}$ $\frac{\square}{\square}$

$\leftarrow$ —————————————————— $\rightarrow$
0   $\frac{1}{7}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ 1

Add the following fractions:

$\dfrac{1}{3} + \dfrac{1}{3} = \dfrac{\square}{\square}$

$\dfrac{1}{4} + \dfrac{1}{4} + \dfrac{1}{4} = \dfrac{\square}{\square}$

$\dfrac{1}{6} + \dfrac{1}{6} + \dfrac{1}{6} + \dfrac{1}{6} + \dfrac{1}{6} = \dfrac{\square}{\square}$

$\dfrac{1}{5} + \dfrac{1}{5} + \dfrac{1}{5} = \dfrac{\square}{\square}$

$\dfrac{1}{8} + \dfrac{1}{8} + \dfrac{1}{8} = \dfrac{\square}{\square}$

$\dfrac{1}{8} + \dfrac{1}{8} + \dfrac{1}{8} + \dfrac{1}{8} + \dfrac{1}{8} = \dfrac{\square}{\square}$

$\dfrac{1}{5} + \dfrac{1}{5} = \dfrac{\square}{\square}$

$\dfrac{1}{5} + \dfrac{1}{5} + \dfrac{1}{5} + \dfrac{1}{5} = \dfrac{\square}{\square}$

$\dfrac{2}{5} + \dfrac{1}{5} = \dfrac{\square}{\square}$

$\dfrac{2}{5} + \dfrac{2}{5} = \dfrac{\square}{\square}$

$\dfrac{3}{5} + \dfrac{1}{5} = \dfrac{\square}{\square}$

$\dfrac{3}{11} + \dfrac{4}{11} = \dfrac{\square}{\square}$

$\dfrac{7}{9} + \dfrac{1}{9} = \dfrac{\square}{\square}$

$\dfrac{2}{7} + \dfrac{3}{7} = \dfrac{\square}{\square}$

Decompose the following fractions into unit fractions. Show few problems with rectangular tiles and circular tiles.

$\dfrac{3}{4} = \dfrac{1}{4} + \dfrac{1}{4} + \dfrac{1}{4}$

$\dfrac{2}{3} =$

$\dfrac{4}{5} =$

$\dfrac{2}{5} =$

$\dfrac{3}{5} =$

$\dfrac{5}{6} =$

$\dfrac{3}{8} =$

$\dfrac{5}{8} =$

To the Teacher: After solving problems on the last page, please ask the student to show few problems with rectangular tiles.

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Fractions: Making of One

Fill in the blanks:

$$\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$$

$$\frac{1}{\square} + \frac{1}{\square} + \frac{1}{\square} = \frac{\square}{\square} = 1$$

$$\frac{2}{3} + \frac{1}{3} = \frac{\square}{\square} = \square$$

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

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

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

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

Perform the additions:

$$\frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$$

$$\frac{1}{2} + \frac{1}{2} = \frac{\square}{\square} = \square$$

$$\frac{5}{6} + \frac{1}{6} = \frac{\square}{\square} = \square$$

$$\frac{5}{8} + \frac{3}{8} = \frac{\square}{\square} = \square$$

$$\frac{3}{5} + \frac{2}{5} = \frac{\square}{\square} = \square$$

$$\frac{3}{4} + \frac{1}{4} = \frac{\square}{\square} = \square$$

$$\frac{7}{10} + \frac{3}{10} = \frac{\square}{\square} = \square$$

$$\frac{7}{12} + \frac{5}{12} = \frac{\square}{\square} = \square$$
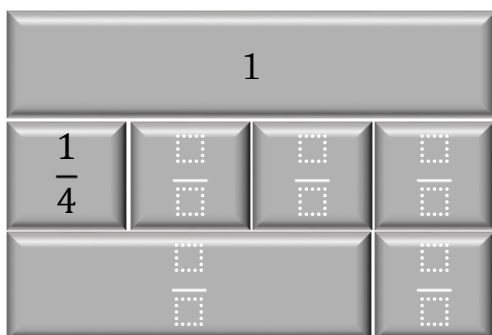
Perform the additions and show with number line.
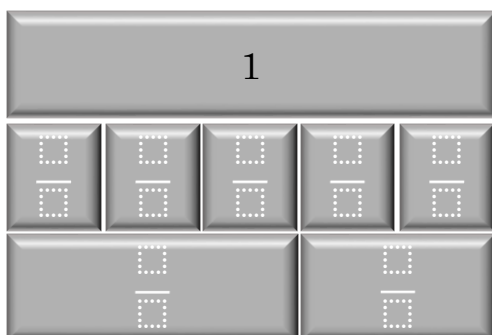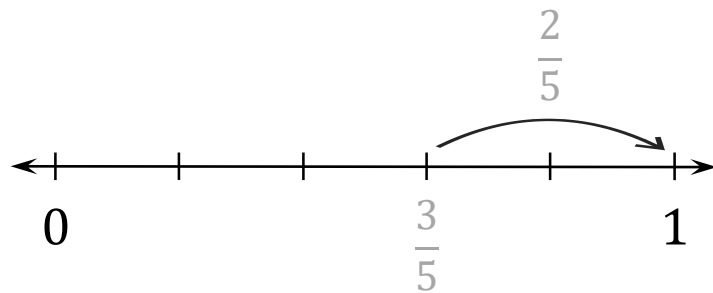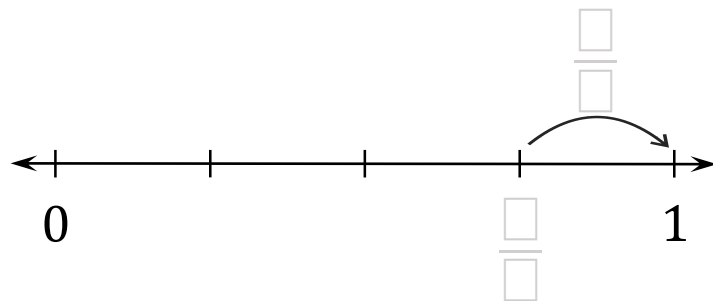
$$\frac{3}{5} + \frac{2}{5} = \frac{5}{5} = 1$$

$$\frac{3}{4} + \frac{1}{4} = \frac{\square}{\square} = \square$$

$$\frac{2}{3} + \frac{1}{3} = \frac{\square}{\square} = \square$$
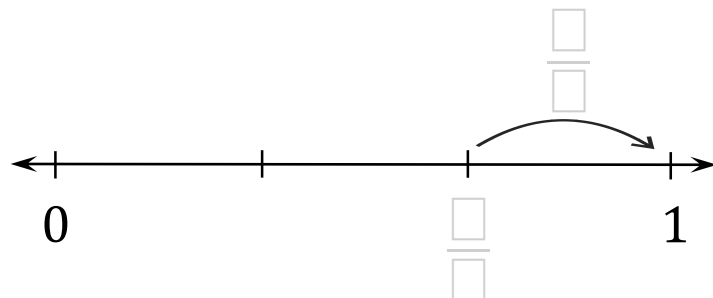
Mixed numbers

Fill in the blanks:

_____

If seven pizzas are divided in two parts, how much pizza will be in each part?

Step 1:
Each part is 3 pizzas with a remainder of 1 pizza

$$3 \text{ with a remainder of } 1$$

$$2\overline{)7}$$
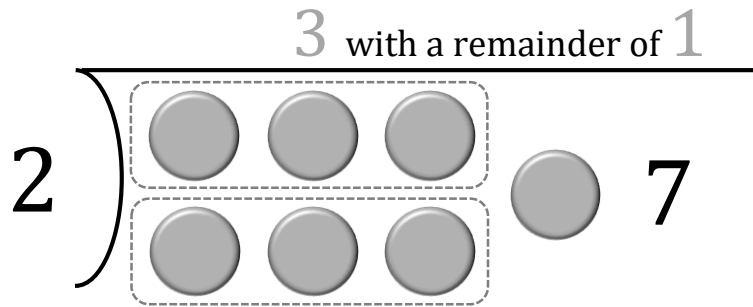
Step 2:
The remainder of 1 is divided in 2 parts.

$$3 \text{ and } \frac{1}{2}$$

$$2\overline{)7}$$
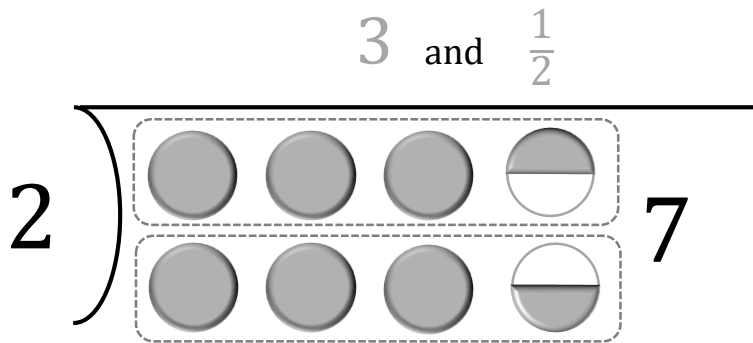
Note: 3 and $\frac{1}{2}$ is written as $3\frac{1}{2}$. ← Mixed number

Summary:

$$
\begin{array}{r}
3 \\
2\overline{)7} \\
-6 \\
\hline
1
\end{array}
\qquad \Rightarrow \qquad \frac{7}{2} = 3\frac{1}{2}
$$

Remainder
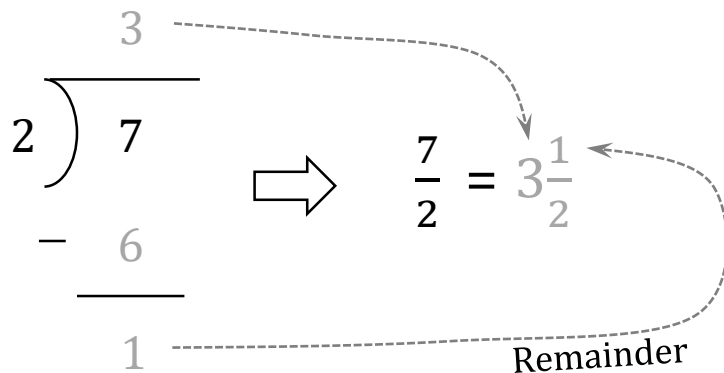
When 7 pizzas are divided in 2 equal parts, each part is $3\frac{1}{2}$ pizza.

If three pizzas are divided in two parts, how much pizza will be in each part?

3 divided in 2 parts → $2\overline{)3}$ → $\dfrac{3}{2}$

$2\overline{)3}$ with quotient 1, -2, remainder 1 ⟹ $\dfrac{3}{2} = 1\dfrac{1}{2}$ ⟹ When 3 pizzas are divided in 2 parts, each part is $1\dfrac{1}{2}$

If five pizzas are divided in two parts, how much pizza will be in each part?

☐ divided in ☐ parts $☐\overline{)☐}$ → $\dfrac{☐}{☐}$

$☐\overline{)☐}$ ⟹ $\dfrac{☐}{☐} = ☐\dfrac{☐}{☐}$ ⟹ When 5 pizzas are divided in 2 parts, each part is $☐\dfrac{☐}{☐}$

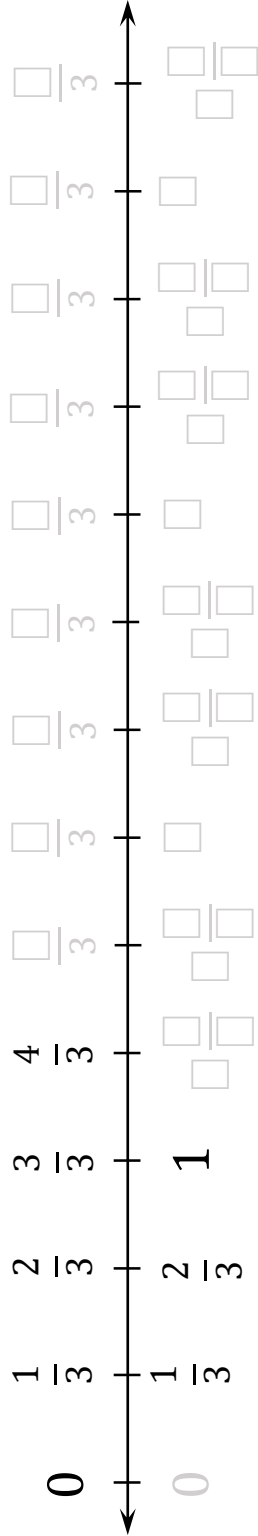If eight pizzas are divided in three parts, how much pizza will be in each part?

☐ divided in ☐ parts $☐\overline{)☐}$ → $\dfrac{☐}{☐}$

$☐\overline{)☐}$ ⟹ $\dfrac{☐}{☐} = ☐\dfrac{☐}{☐}$ ⟹ When 8 pizzas are divided in 3 parts, each part is $☐\dfrac{☐}{☐}$

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Conversion to Improper Fractions

Fill in the numbers on a number line:

$$0 \quad \frac{1}{3} \quad \frac{2}{3} \quad \frac{3}{3} \quad \frac{4}{3} \quad \frac{\square}{3} \quad \frac{\square}{3} \quad \frac{\square}{3} \quad \frac{\square}{3} \quad \frac{\square}{3} \quad \frac{\square}{3} \quad \frac{\square}{3} \quad \frac{\square}{3}$$

$$0 \quad \frac{1}{3} \quad \frac{2}{3} \quad 1 \quad 1\frac{\square}{3} \quad 1\frac{\square}{3} \quad \square \quad 2\frac{\square}{3} \quad 2\frac{\square}{3} \quad \square \quad 3\frac{\square}{3} \quad 3\frac{\square}{3}$$

Convert mixed numbers to improper fractions. Show them on a number line.

$$2\frac{1}{3} = \frac{7}{3}$$

$$2 \times 3 = 6 \qquad 6 + 1 = 7$$

$$2\frac{2}{3} = \frac{\square}{\square}$$

$$\square \times \square = \square \qquad \square + \square = \square$$

$$3\frac{2}{3} = \frac{\square}{\square}$$

$$\square \times \square = \square \qquad \square + \square = \square$$

Convert the mixed numbers to improper fractions:

$\square + \square = \square$

$\square \times \square = \square$

$4\dfrac{1}{2} = \dfrac{\square}{\square}$

$\square + \square = \square$

$\square \times \square = \square$

$5\dfrac{1}{2} = \dfrac{\square}{\square}$

$\square + \square = \square$

$\square \times \square = \square$

$2\dfrac{1}{5} = \dfrac{\square}{\square}$

$\square + \square = \square$

$\square \times \square = \square$

$3\dfrac{2}{5} = \dfrac{\square}{\square}$

$\square + \square = \square$

$\square \times \square = \square$

$2\dfrac{1}{10} = \dfrac{\square}{\square}$

$\square + \square = \square$

$\square \times \square = \square$
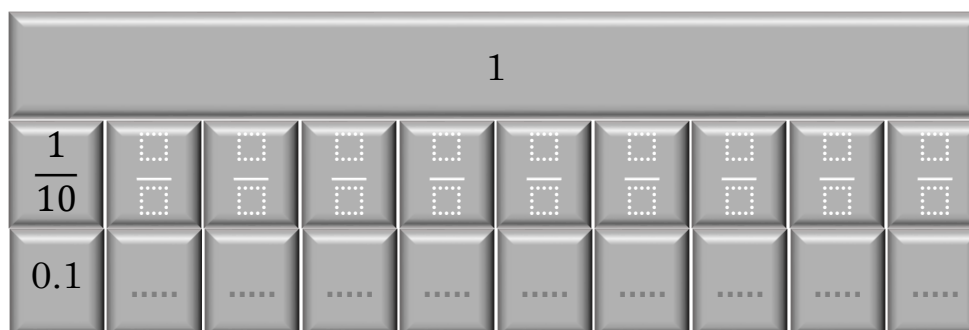
$1\dfrac{2}{7} = \dfrac{\square}{\square}$

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Decimals: Introduction

Decimals are fractions with a place value of tenth, hundredth and so forth.

$$\frac{1}{10} = 0.1 = .1$$

Decimal point

Fill in the blanks below with fractions and decimals

1

| $\frac{1}{10}$ | | | | | | | | | |

| 0.1 | | | | | | | | | |

$\frac{1}{10}$
.1

$\frac{1}{10}$

0.1

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
.1	.1	.1	.1	.1

$\frac{\square}{10}$

$\frac{1}{10}$	$\frac{1}{10}$
.1	.1

$\frac{\square}{10}$

0.2

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
.1	.1	.1	.1	.1	.1

$\frac{\square}{10}$

1	$\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$
1	.1 .1 .1 .1 .1 .1 .1

$\square\frac{\square}{\square}$

1	1	$\frac{1}{10}$
1	1	.1

$\square\frac{\square}{\square}$

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Sample page

Convert from fractions to decimals and vice versa:

$\frac{1}{10} =$	$\frac{3}{10} =$	$\frac{8}{10} =$	$\frac{9}{10} =$
$1\frac{1}{10} =$	$1\frac{3}{10} =$	$1\frac{8}{10} =$	$1\frac{9}{10} =$
$4\frac{1}{10} =$	$4\frac{3}{10} =$	$4\frac{8}{10} =$	$4\frac{9}{10} =$
$4\frac{4}{10} =$	$4\frac{5}{10} =$	$4\frac{7}{10} =$	$4\frac{2}{10} =$
$0.1 = \frac{\square}{10}$	$0.2 = \frac{\square}{10}$	$0.3 = \frac{\square}{\square}$	$0.7 = \frac{\square}{\square}$
$1.1 = \square\frac{\square}{10}$	$1.2 = \square\frac{\square}{10}$	$1.3 = \square\frac{\square}{\square}$	$1.7 = \square\frac{\square}{\square}$
$1.6 = \square\frac{\square}{10}$	$1.9 = \square\frac{\square}{\square}$	$1.5 = \square\frac{\square}{10}$	$1.4 = \square\frac{\square}{10}$
$7.6 = \square\frac{\square}{10}$	$7.9 = \square\frac{\square}{\square}$	$7.5 = \square\frac{\square}{10}$	$7.4 = \square\frac{\square}{10}$
$2\frac{5}{10} =$	$1\frac{7}{10} =$	$0.3 = \frac{\square}{10}$	$0.4 = \frac{\square}{\square}$
$6.4 = \square\frac{\square}{\square}$	$6.7 = \square\frac{\square}{\square}$	$\frac{9}{10} =$	$\frac{3}{10} =$
$3\frac{1}{10} =$	$1\frac{3}{10} =$	$1.8 = \square\frac{\square}{10}$	$1.2 = \square\frac{\square}{10}$

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Sample page

Addition of Mixed Numbers

Perform the following additions:

$3 + \dfrac{2}{5} = \boxed{}\dfrac{\boxed{}}{\boxed{}}$

| 1 | 1 | 1 | $\frac{1}{5}$ | $\frac{1}{5}$ |

$\dfrac{3}{5} + \dfrac{1}{5} = \dfrac{\boxed{}}{\boxed{}}$

| $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ |

$2 + 1\dfrac{2}{5} = \boxed{}\dfrac{\boxed{}}{\boxed{}}$

| 1 | 1 | 1 | $\frac{1}{5}$ | $\frac{1}{5}$ |

$2\dfrac{3}{5} + \dfrac{1}{5} = \boxed{}\dfrac{\boxed{}}{\boxed{}}$

| 1 | 1 | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ | $\frac{1}{5}$ |

$2\dfrac{3}{5} + 1\dfrac{1}{5}$

⤷ Add ones only

$= 3\dfrac{3}{5} + \dfrac{1}{5}$

⤷ Add fractions

$= 3\dfrac{4}{5}$
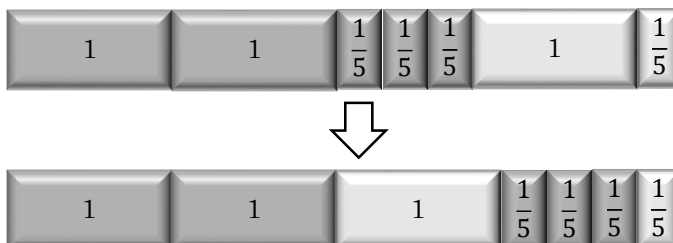
$1\dfrac{2}{5} + 2\dfrac{2}{5}$

⤷ Add ones only

$= \boxed{}\dfrac{\boxed{}}{\boxed{}} + \dfrac{\boxed{}}{\boxed{}}$

⤷ Add fractions

$= \boxed{}\dfrac{\boxed{}}{\boxed{}}$
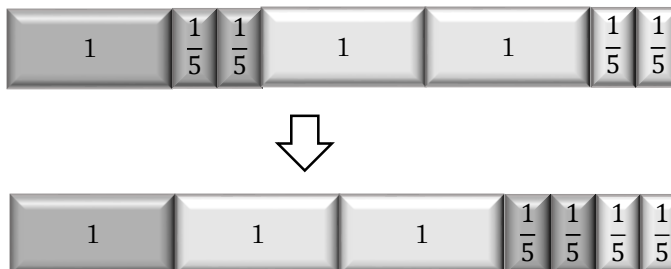
To the Teacher: After solving few problems, please ask the student to show them with rectangular tiles.

Perform the following additions:

Steps: (1) Add ones only.

(2) Add fractions.

(3) Show the operation with rectangular tiles for first six problems.

$4 + 2\frac{2}{3}$ $= \square\frac{\square}{\square}$	$3 + 2\frac{2}{3}$ $= \square\frac{\square}{\square}$	$2\frac{1}{3} + 1\frac{1}{3}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$
$1\frac{2}{5} + 2\frac{1}{5}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$	$3\frac{1}{5} + 1\frac{1}{5}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$	$1\frac{1}{3} + 1\frac{1}{3}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$
$2\frac{1}{7} + 3\frac{2}{7}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$	$3\frac{2}{11} + 4\frac{3}{11}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$	$1\frac{3}{9} + 4\frac{2}{9}$ $= \square\frac{\square}{\square} + \frac{\square}{\square}$ $= \square\frac{\square}{\square}$
$1\frac{1}{11} + 1\frac{1}{11}$ $=$ $=$	$5\frac{5}{7} + 1\frac{1}{7}$ $=$ $=$	$3\frac{2}{9} + 3\frac{2}{9}$ $=$ $=$

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Decimals with number lines

Fill the number line below:
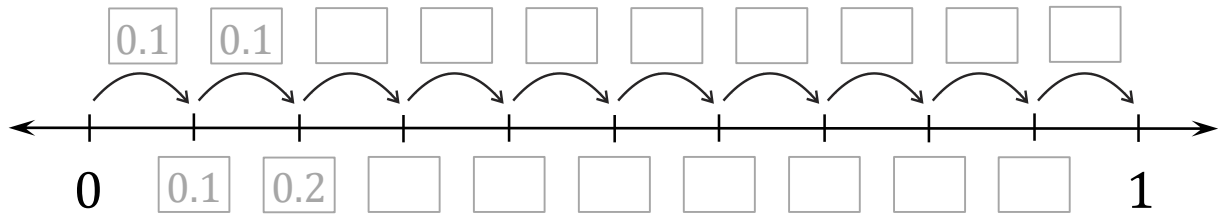
Write addition equations below in fractions and decimal format:

$$0.4 + 0.2 = 0.6$$

...... + ... = ...

...... + ... = ...

...... + ... = ...

⬜
⬜ 0 ⬜   1   ...... + ... = ...

⬜
0 ⬜   1   ...... + ... = ...

⬜
0   ⬜   1   ...... + ... = ...

⬜
0   ⬜   1   ...... + ... = ...

⬜
0   ⬜   1   ...... + ... = ...

⬜
0   ⬜   1   ...... + ... = ...
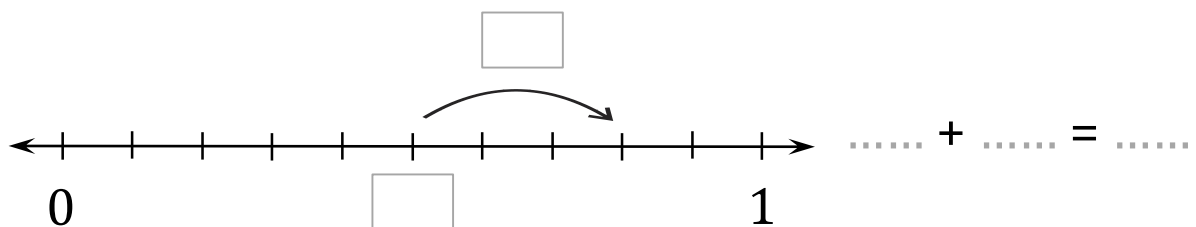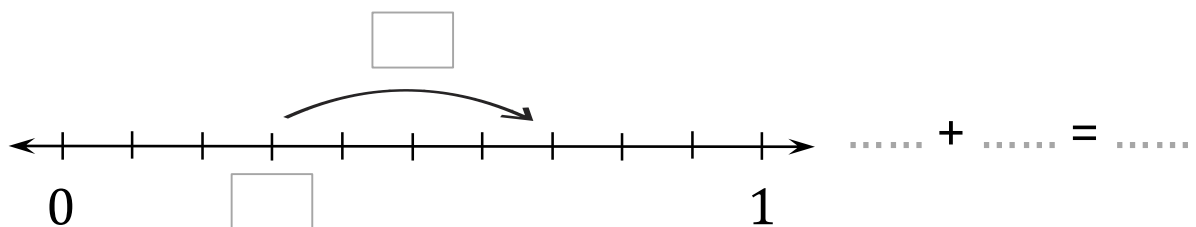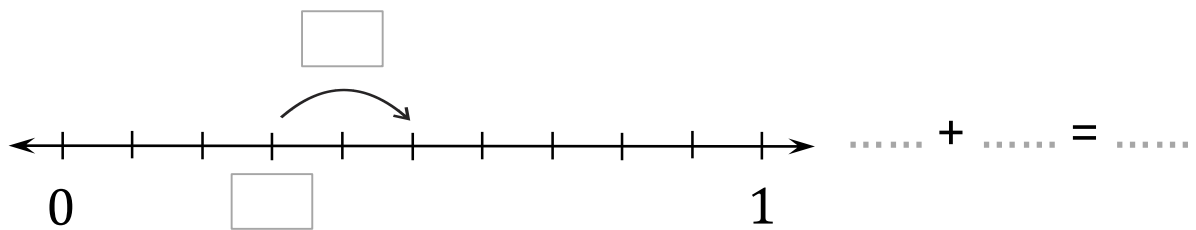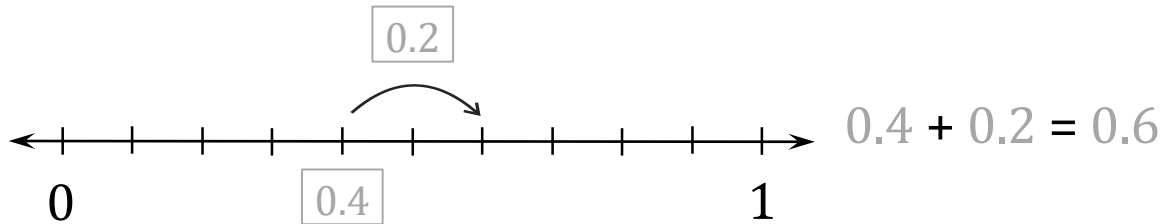
Sample page
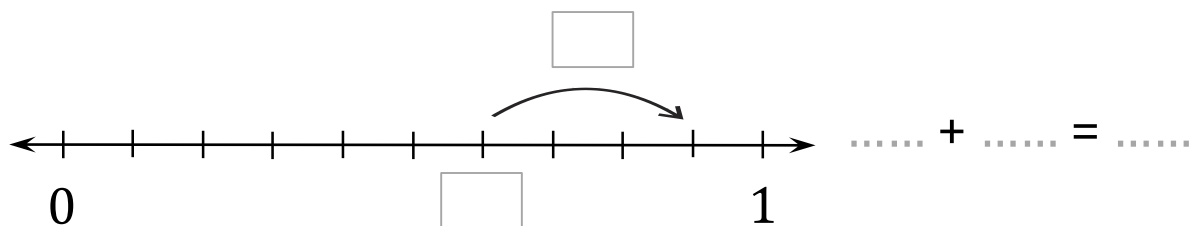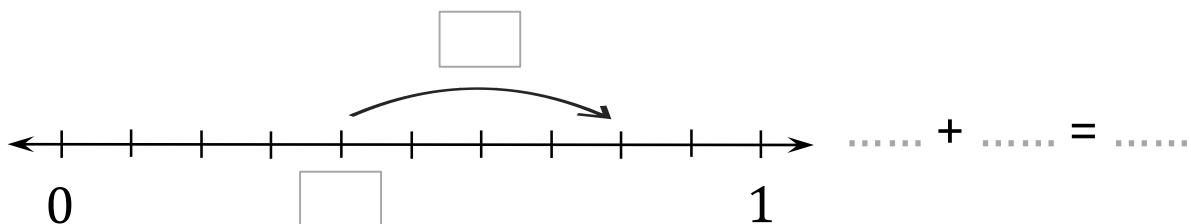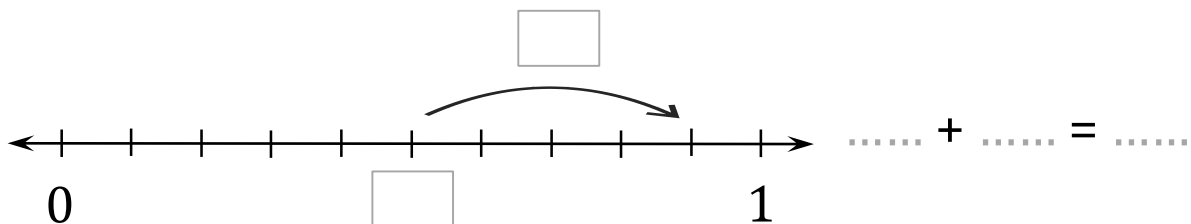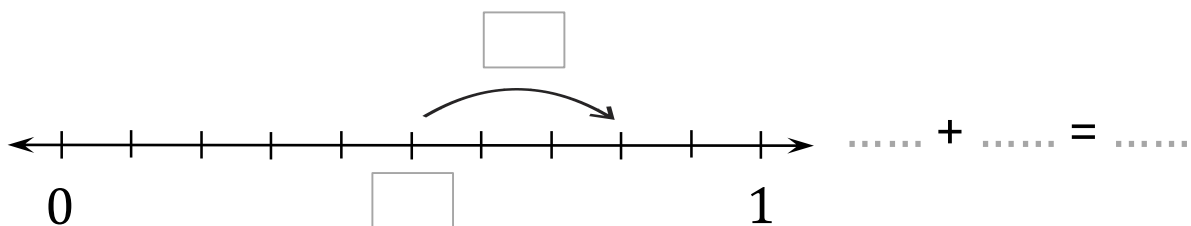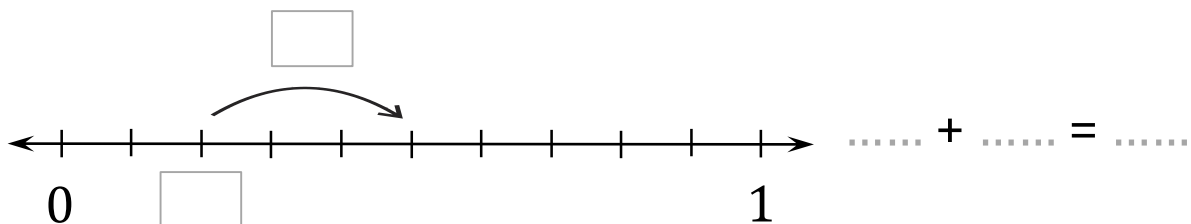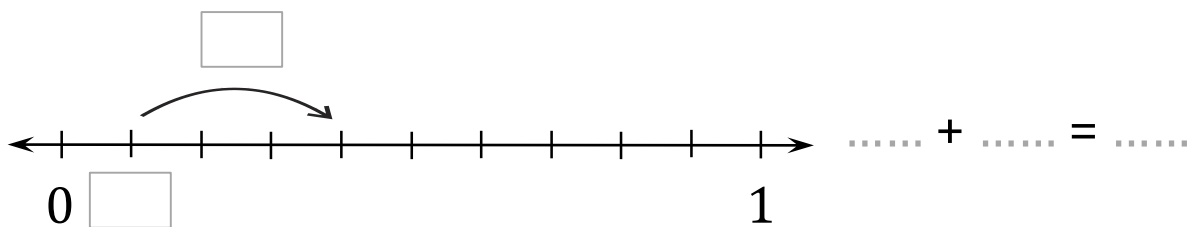
Decimals: Place Values

Fill in the numbers below:

1s place	.1s place
0.1	.1
0.2	.1 .1
☐	.1 .1 .1
☐	.1 .1 .1 .1
☐	.1 .1 .1 .1 .1
☐	.1 .1 .1 .1 .1 .1
☐	.1 .1 .1 .1 .1 .1 .1
☐	.1 .1 .1 .1 .1 .1 .1 .1
☐	.1 .1 .1 .1 .1 .1 .1 .1 .1
1 / 1.0	
1 / 1.1	.1
1 / ☐	.1 .1
1 / ☐	.1 .1 .1
1 / ☐	.1 .1 .1 .1

1s place		.1s place

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Sample page

Addition of Fractions

Fill in the blanks:
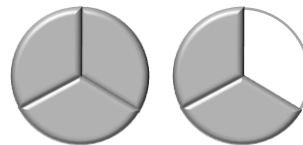
$\dfrac{3}{3} = 1$	$\dfrac{5}{3} = 1\dfrac{2}{3}$
$\dfrac{\square}{3} = \square$	$\dfrac{\square}{3} = \square\dfrac{\square}{\square}$
$\dfrac{\square}{\square} = \square\dfrac{\square}{\square}$	$\dfrac{\square}{\square} = \square\dfrac{\square}{\square}$
$\dfrac{\square}{\square} = \square\dfrac{\square}{\square}$	$\dfrac{\square}{\square} = \square\dfrac{\square}{\square}$
$\dfrac{\square}{\square} = \square\dfrac{\square}{\square}$	$\dfrac{\square}{\square} = \square\dfrac{\square}{\square}$

Sample page

$$\frac{2}{3} \quad + \quad \frac{2}{3} \quad = \quad \frac{4}{3} \quad = \quad 1\frac{1}{3}$$

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

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

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

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

$$\frac{\square}{\square} \; + \; \frac{\square}{\square} \; = \; \frac{\square}{\square} \; = \; \square\frac{\square}{\square}$$
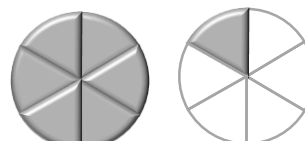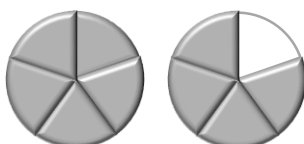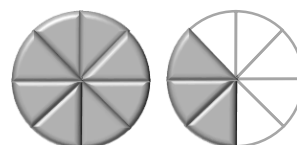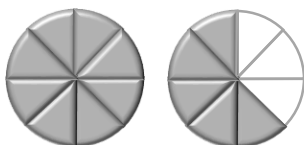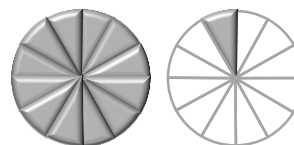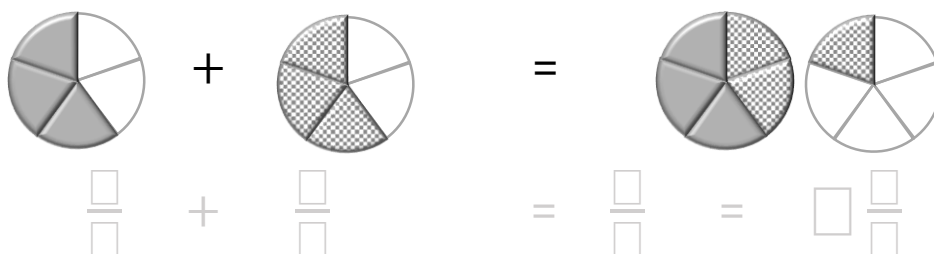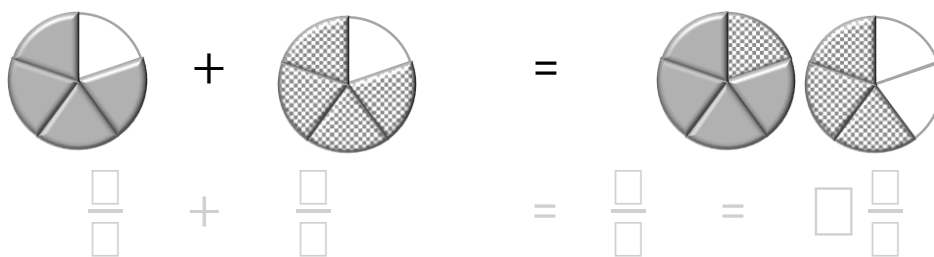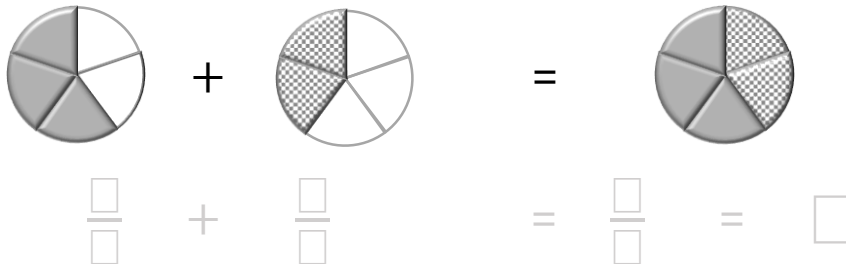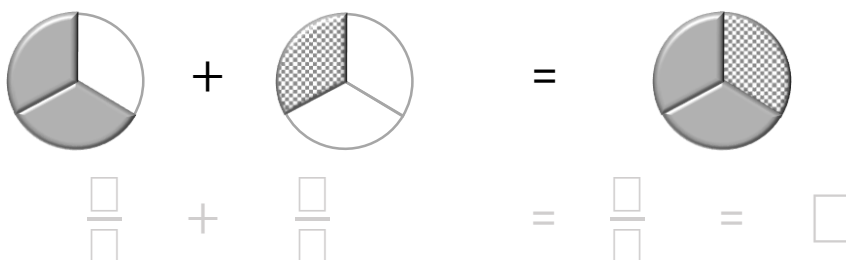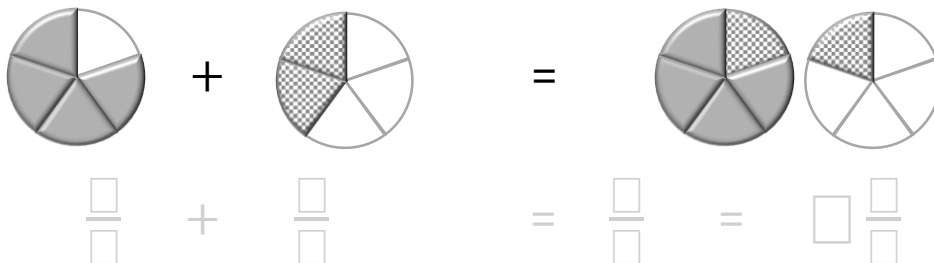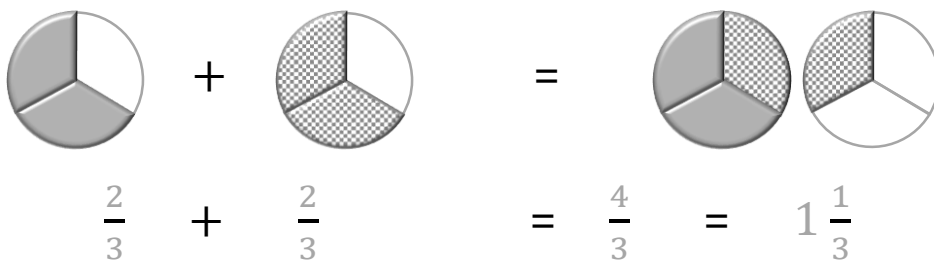
To the Teacher: Please ask the student to show few problems with tiles.

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Decimals – Decomposition

Decompose the following numbers:

	1s	0.1s	0.01s

4.58 = 4 + 0.5 + 0.08

3.56 = ... + ... + ...

3.01 = ... + ... + ...

0.78 = ... + ... + ...

6.08 = ... + ... + ...

0.52 = ... + ... + ...

4.07 = ... + ... + ...

2.01 = ... + ... + ...

0.86 = ... + ... + ...

3.08 = ... + ... + ...

6.3 = ... + ... + ...

	1s	0.1s	0.01s

1.68 = ... + ... + ...

7.41 = ... + ... + ...

4.5 = ... + ... + ...

3.08 = ... + ... + ...

0.63 = ... + ... + ...

5.7 = ... + ... + ...

2.09 = ... + ... + ...

0.64 = ... + ... + ...

7.4 = ... + ... + ...

3.04 = ... + ... + ...

0.73 = ... + ... + ...

Compose a number by adding numbers below:

4 + 0.3 + 0.07 = ...	1 + 0.3 + 0.04 = ...
6 + 0.3 = ...	0.4 + 0.02 = ...
0.7 + 0.03 = ...	5 + 0.3 = ...
6 + 0.03 = ...	3 + 0.06 = ...
5 + 0.2 + 0.06 = ...	7 + 0.8 + 0.08 = ...
0.7 + 0.04 = ...	3 + 0.3 = ...
8 + 0.2 = ...	0.7 + 0.02 = ...
5 + 0.04 = ...	1 + 0.07 = ...
4 + 0.8 = ...	0.6 + 0.03 = ...
0.5 + 0.01 = ...	3 + 0.5 = ...
3 + 0.02 = ...	7 + 0.01 = ...
8 + 0.4 + 0.06 = ...	4 + 0.2 + 0.05 = ...
0.7 + 0.06 = ...	8 + 0.1 = ...
4 + 0.8 = ...	0.3 + 0.08 = ...
8 + 0.04 = ...	7 + 0.06 = ...
2 + 0.6 = ...	0.5 + 0.04 = ...

To the Teacher: (1) Material needed: Decimals chips for 1s, 0.1s, 0.01s (2) Please ask the student to pick chips making following numbers sequentially (one at a time): 1 , 0.1, 0.01, 6, 0.6, 0.06, 3, 0.3, 0.03 0.8, 8, 0.08, 5, 0.5, 0.05, 0.7, 0.07, 7, 0.02, 2, 0.2, 4, 0.4, 0.04 (2) Please ask to show few numbers on this page with chips.

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Expansion/Reduction of Fractions

Value of a fraction remains same after multiplying or dividing its numerator and denominator by the same number.

Fill in the blanks below. Show with circular tiles.

$$\overset{\div 2}{\overbrace{\frac{4}{6}}} = \frac{\square}{\square} \underset{\div 2}{}$$

$$\overset{\div \square}{\overbrace{\frac{\square}{\square}}} = \frac{\square}{\square} \underset{\div \square}{}$$

$$\overset{\div \square}{\overbrace{\frac{\square}{\square}}} = \frac{\square}{\square} \underset{\div \square}{}$$

$$\overset{\div \square}{\overbrace{\frac{\square}{\square}}} = \frac{\square}{\square} \underset{\div \square}{}$$

$$\overset{\div \square}{\overbrace{\frac{\square}{\square}}} = \frac{\square}{\square} \underset{\div \square}{}$$

$$\overset{\div \square}{\overbrace{\frac{\square}{\square}}} = \frac{\square}{\square} \underset{\div \square}{}$$

To the Teacher: After solving few problems of reduction, please ask the student to show them with circular tiles.

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Sample page

Fill in the blanks by multiplying or dividing numerator and denominator by the same number.

$\dfrac{3}{4} = \dfrac{6}{8}$	$\dfrac{10}{12} = \dfrac{\square}{6}$	$\dfrac{4}{12} = \dfrac{\square}{3}$	$\dfrac{3}{4} = \dfrac{\square}{8}$
$\dfrac{2}{12} = \dfrac{\square}{6}$	$\dfrac{2}{5} = \dfrac{\square}{10}$	$\dfrac{2}{5} = \dfrac{\square}{15}$	$\dfrac{4}{5} = \dfrac{\square}{10}$
$\dfrac{8}{12} = \dfrac{\square}{3}$	$\dfrac{5}{6} = \dfrac{\square}{12}$	$\dfrac{4}{10} = \dfrac{\square}{5}$	$\dfrac{6}{8} = \dfrac{\square}{4}$
$\dfrac{6}{10} = \dfrac{\square}{5}$	$\dfrac{9}{12} = \dfrac{\square}{4}$	$\dfrac{8}{10} = \dfrac{\square}{5}$	$\dfrac{4}{6} = \dfrac{\square}{3}$
$\dfrac{3}{5} = \dfrac{\square}{10}$	$\dfrac{2}{3} = \dfrac{\square}{6}$	$\dfrac{2}{3} = \dfrac{\square}{12}$	$\dfrac{3}{4} = \dfrac{\square}{12}$

Reduce the fraction to its lowest denominator by dividing numerator and denominator by the same number.

$\dfrac{4}{6} = \dfrac{2}{3}$	$\dfrac{8}{12} = \dfrac{\square}{\square}$	$\dfrac{4}{8} = \dfrac{\square}{\square}$	$\dfrac{8}{10} = \dfrac{\square}{\square}$
$\dfrac{2}{12} = \dfrac{\square}{\square}$	$\dfrac{9}{12} = \dfrac{\square}{\square}$	$\dfrac{2}{8} = \dfrac{\square}{\square}$	$\dfrac{4}{10} = \dfrac{\square}{\square}$
$\dfrac{6}{15} = \dfrac{\square}{\square}$	$\dfrac{6}{10} = \dfrac{\square}{\square}$	$\dfrac{2}{12} = \dfrac{\square}{\square}$	$\dfrac{6}{15} = \dfrac{\square}{\square}$
$\dfrac{8}{10} = \dfrac{\square}{\square}$	$\dfrac{2}{8} = \dfrac{\square}{\square}$	$\dfrac{4}{10} = \dfrac{\square}{\square}$	$\dfrac{9}{12} = \dfrac{\square}{\square}$
$\dfrac{10}{12} = \dfrac{\square}{\square}$	$\dfrac{6}{8} = \dfrac{\square}{\square}$	$\dfrac{6}{10} = \dfrac{\square}{\square}$	$\dfrac{8}{12} = \dfrac{\square}{\square}$

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Addition with unlike denominators

Add the following fractions after expanding to least common denominators:

$$\frac{2}{3} + \frac{1}{4}$$

Multiples of denominators → $3\,,6\,,9\,,\boxed{12}\,,15\,,18\,,21\,,24\,,27$

$4\,.\,8\,.\,\boxed{12}\,.\,16\,.\,20\,.\,24\,.\,28$

$$= \frac{\Box}{\Box} + \frac{\Box}{\Box}$$
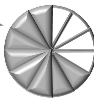
$$\frac{2}{3} = \frac{\Box}{12} \quad , \quad \frac{1}{4} = \frac{\Box}{12}$$

$$= \frac{\Box}{\Box}$$

Interpret the addition with place value frame:

Place values → $\frac{1}{2}$ s place	$\frac{1}{3}$ s place	$\frac{1}{4}$ s place	$\frac{1}{6}$ s place	$\frac{1}{12}$ s place	$\frac{1}{15}$ s place
	$\frac{\Box}{\Box}$			$\frac{\Box}{\Box}$	
		$\frac{\Box}{\Box}$		$\frac{\Box}{\Box}$	

To the Teacher: Please ask the student to perform the following activities with circular chips:
(1) Select two tiles of 1/3s and one tile of 1/4s as per the problem.
(2) Exchange tiles of 1/3s for the tiles of the common denominator (i.e. 1/12s in the above problem)
(3) Exchange tiles of 1/4s for the tiles of the common denominator (i.e. 1/12s in the above problem)
(4) How much is the total? Is it same as the answer?

Add the following fractions after expanding to least common denominators:

$$\frac{2}{3} + \frac{1}{6}$$ Multiples of denominators $\longrightarrow$ $3, (6), 9, 12, 15$
$(6), 12, 18, 24$

$\downarrow$

$$\frac{2}{3} = \frac{\square}{\square} \quad , \quad \frac{1}{6} = \frac{\square}{6}$$

$\longleftarrow$

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

$$= \frac{\square}{\square}$$

Interpret the addition with place value frame:

Place values →	$\frac{1}{2}$ s place	$\frac{1}{3}$ s place	$\frac{1}{4}$ s place	$\frac{1}{6}$ s place	$\frac{1}{12}$ s place	$\frac{1}{15}$ s place
		$\frac{\square}{\square}$		$\frac{\square}{\square}$		
				$\frac{\square}{\square}$		

To the Teacher: Please ask student to perform the following activities with circular chips:
(1) Select two tiles of 1/3s and one tile of 1/6s as per the problem.
(2) Note that the tile of 1/6 need not be exchanged for anything because its denominator is the common denominator.
(3) Exchange tiles of 1/3s for the tiles of the common denominator (i.e. 1/6s in the above problem)
(4) How much is the total? Is it same as the answer?

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$\dfrac{1}{4}$ + $\dfrac{2}{5}$ $\xrightarrow{\text{Multiples of denominators}}$ 4 , ...

5 , ...

$\downarrow$

= $\dfrac{\square}{\square}$ + $\dfrac{\square}{\square}$

$\dfrac{1}{4}$ = $\dfrac{\square}{\square}$, $\dfrac{2}{5}$ = $\dfrac{\square}{\square}$

= $\dfrac{\square}{\square}$

Place values →	$\dfrac{1}{2}$ s place	$\dfrac{1}{3}$ s place	$\dfrac{1}{4}$ s place	$\dfrac{1}{5}$ s place	$\dfrac{1}{12}$ s place	$\dfrac{1}{20}$ s place
			$\dfrac{\square}{\square}$			$\dfrac{\square}{\square}$
				$\dfrac{\square}{\square}$		$\dfrac{\square}{\square}$

$\dfrac{2}{5}$ + $\dfrac{3}{10}$ $\xrightarrow{\text{Multiples of denominators}}$ 5 , ...

10 , ...

$\downarrow$

= $\dfrac{\square}{\square}$ + $\dfrac{\square}{\square}$

$\dfrac{2}{5}$ = $\dfrac{\square}{\square}$, $\dfrac{3}{10}$ = $\dfrac{\square}{10}$

= $\dfrac{\square}{\square}$

Place values →	$\dfrac{1}{2}$ s place	$\dfrac{1}{3}$ s place	$\dfrac{1}{4}$ s place	$\dfrac{1}{5}$ s place	$\dfrac{1}{8}$ s place	$\dfrac{1}{10}$ s place
				$\dfrac{\square}{\square}$		$\dfrac{\square}{\square}$
						$\dfrac{\square}{\square}$

467

$$\frac{1}{3} \ + \ \frac{3}{5}$$

Multiples of denominators → ⋯⋯⋯⋯⋯⋯⋯⋯⋯

⋯⋯⋯⋯⋯⋯⋯⋯⋯ ↓

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

←——————— $$\frac{1}{3} = \frac{\square}{\square} \quad , \quad \frac{3}{5} = \frac{\square}{\square}$$

$$= \frac{\square}{\square}$$

Place values →

$\frac{1}{2}$ s place	$\frac{1}{3}$ s place	$\frac{1}{4}$ s place	$\frac{1}{5}$ s place	$\frac{1}{12}$ s place	$\frac{1}{15}$ s place
	$\frac{\square}{\square}$				$\frac{\square}{\square}$
			$\frac{\square}{\square}$		$\frac{\square}{\square}$

$$\frac{1}{4} \ + \ \frac{3}{8}$$

Multiples of denominators → ⋯⋯⋯⋯⋯⋯⋯⋯⋯

⋯⋯⋯⋯⋯⋯⋯⋯⋯ ↓

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

←——————— $$\frac{1}{4} = \frac{\square}{\square} \quad , \quad \frac{3}{8} = \frac{\square}{\square}$$

$$= \frac{\square}{\square}$$

Place values →

$\frac{1}{2}$ s place	$\frac{1}{3}$ s place	$\frac{1}{4}$ s place	$\frac{1}{5}$ s place	$\frac{1}{8}$ s place	$\frac{1}{12}$ s place
		$\frac{\square}{\square}$		$\frac{\square}{\square}$	
				$\frac{\square}{\square}$	