

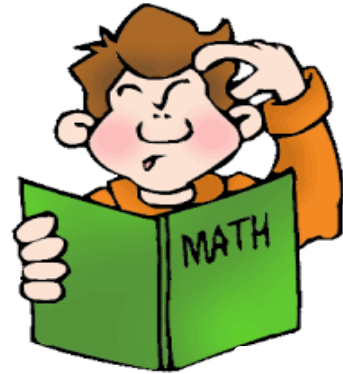


P4 Math Sharing

9 April 2016

For Parents

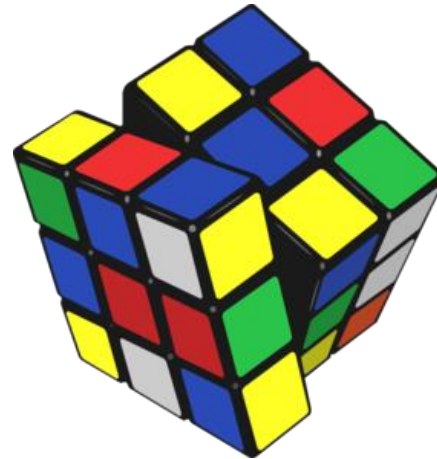
Objectives



- To **identify students' common mistakes** and misconceptions and consider ways in which we might use these constructively to promote learning
- To use **metacognitive strategies** when solving Math problems
- To help parents have a **better understanding** of how a Mathematical problem is solved.
- To show parents how students should **present their solutions.**

Content

- Common Errors in Math
- Clarifying misconceptions in Fractions using the Concrete-Pictorial-Abstract (CPA) approach
- Model Drawing
 - ✓ Part Whole
 - ✓ Comparison
 - ✓ Unitary
- Replacement Method

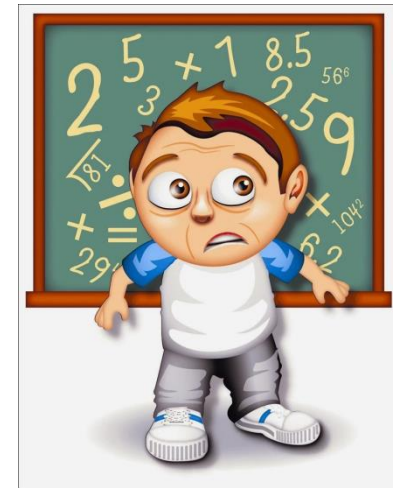


Early Success, Strong Basics, Steady Progress

- Early success builds students' **confidence** and **motivates** them to learn. This, in turn, increases the chances of **further success** in learning.
- Strong foundation stresses the importance of **mastering basic concepts** and skills that are critical to further learning.
- Steady progress emphasises the need for children to **build up their learning gradually**, with **understanding**.

What do we do with mistakes and misconceptions?

- Avoid them whenever possible. ‘If I warn learners about the misconceptions as I teach, they are less likely to happen. **Prevention is better than cure.**’
- Use them as **learning opportunities.** ‘I actively encourage learners to make mistakes and to learn from them.’



Numbers - Estimation

Rounding (Up)

Round 6 587 to the nearest hundred.

- $6\ 587 \approx 6\ 687$ ✗
- $6\ 587 \approx 6\ 600$ ✓

Round 12.38 to the nearest tenth.

- $12.38 \approx 12.48$ ✗
- $12.38 \approx 12.4$ ✓



Student misapplies the rule for “rounding up” and changes the digit in the designated place value while leaving digits in other place values as they are.

Numbers - Estimation

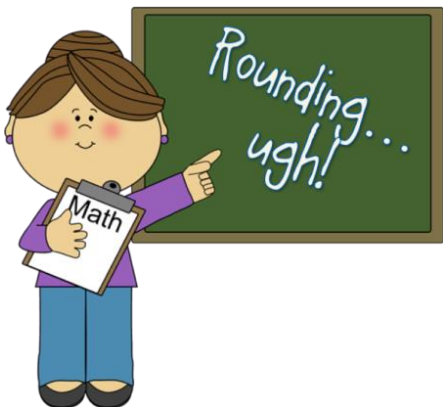
Rounding (Down)

Round off 5 492 to the nearest thousand.

- $5\ 492 \approx 4\ 492$ or 4000 ✗
- $5\ 492 \approx 5\ 000$ ✓

• Round off 32.54 to the nearest tenth.

- $32.54 \approx 32.4$ or 32.44 ✗
- $32.54 \approx 32.5$ ✓



Student misapplies the rule for “rounding down” and actually lowers the value of the digit in the designated place value.

Multiplication – by 2 digits

$$\begin{array}{r}
 62 \\
 \times 38 \\
 \hline
 496 \\
 + 186 \\
 \hline
 682 \quad \times
 \end{array}$$

- Multiplies correctly by ones digit but ignores the fact that the 3 in the tens place means 30.

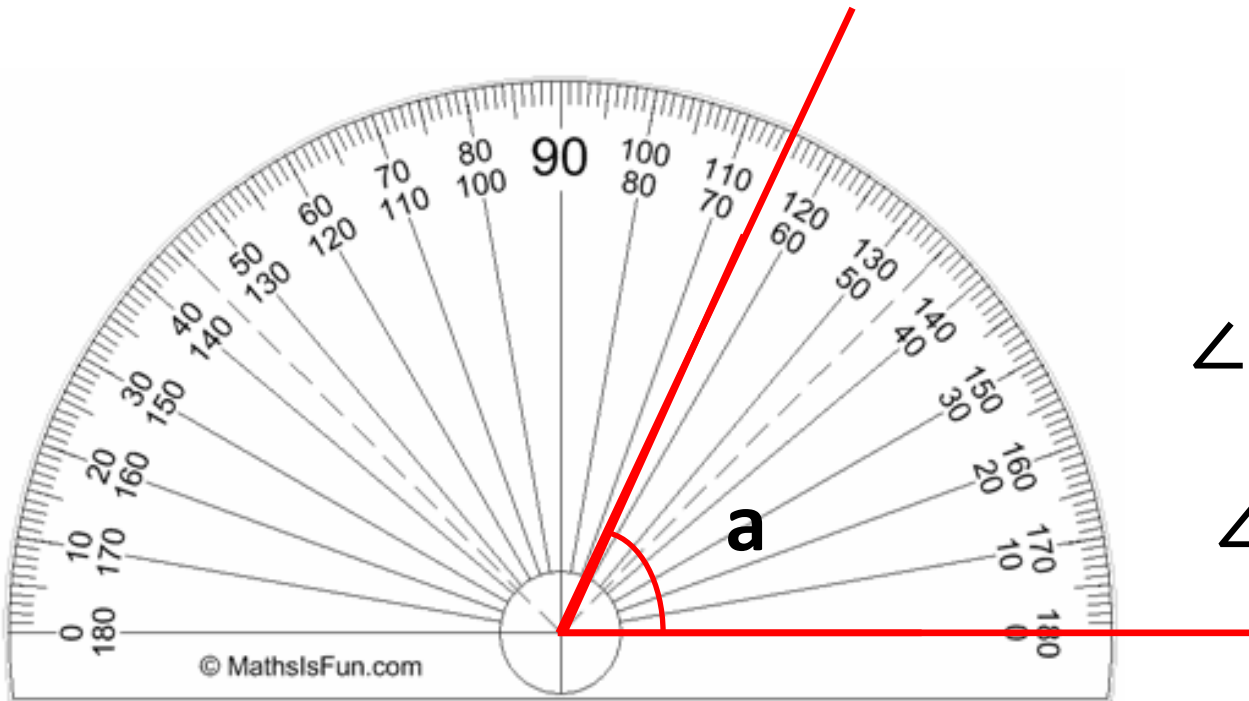
Check for reasonableness of answer.

$$62 \approx 60, 38 \approx 40$$

$$60 \times 40 = \underline{2400}$$



Angles – Using the Protractor



$$\angle a = 75^\circ \text{ or } 125^\circ \quad \times$$

$$\angle a = 65^\circ \quad \checkmark$$

Check for reasonableness of answer.

- Is $\angle a$ smaller or bigger than 90° ?
- Do I read the inner or outer scale?



Mixed Numbers & Improper Fractions

- How many thirds are there in $2\frac{1}{3}$?

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

Answer: $\frac{7}{3}$ thirds ✗

7 thirds ✓



Check for reasonableness of answer.

How many → quantity
How many thirds are there in 1 whole?

- Changes the mixed number, $2\frac{1}{3}$ to an improper fraction, without understanding the question.

Fractions – Addition & Subtraction

$$\frac{9}{10} + \frac{3}{5} = \frac{12}{15} \quad \times$$

$$\begin{aligned} & \frac{9}{10} + \frac{3}{5} \\ &= \frac{9}{10} + \frac{6}{10} \\ &= \frac{15}{10} = 1\frac{5}{10} = 1\frac{1}{2} \end{aligned}$$

- Adds the numerator and denominator.

Check for reasonableness of answer.

$\frac{9}{10}$ is almost 1 whole and $\frac{3}{5}$ is more than $\frac{1}{2}$ so the answer should be **more than 1**.

Meaningful Learning in Mathematics



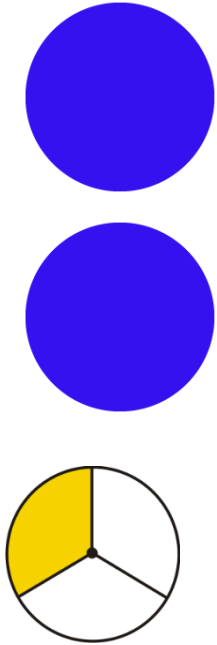
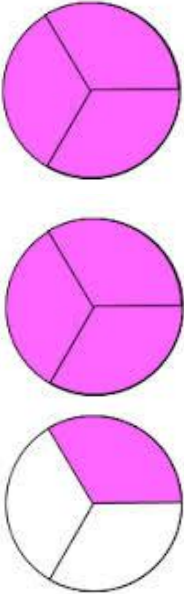
- Action-based information
- Use of real objects

- Image-based information

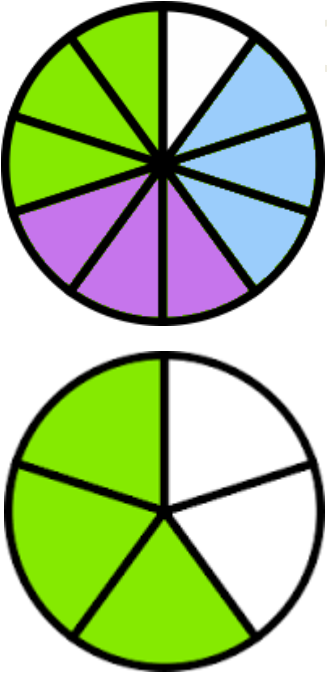
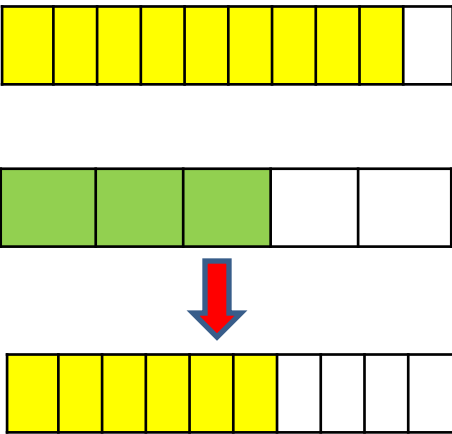
- Language – based information
- Written symbols



Teaching Concept: C-P-A approach

Concept	Concrete	Pictorial	Abstract
Change the mixed number, $2\frac{1}{3}$ to an improper fraction			$2\frac{1}{3}$ $= 2 + \frac{1}{3}$ $= \frac{3}{3} + \frac{3}{3} + \frac{1}{3}$ $= \frac{7}{3}$ $= 7 \text{ thirds}$
	Fraction Discs Fraction Strips	Drawings diagrams models	

Teaching Concept: C-P-A approach

Concept	Concrete	Pictorial	Abstract
<p>Adding related fractions with answer exceeding 1 whole.</p> $\frac{9}{10} + \frac{3}{5}$			$\begin{aligned} \frac{9}{10} + \frac{3}{5} \\ &= \frac{9}{10} + \frac{6}{10} \\ &= \frac{15}{10} = 1\frac{5}{10} \\ &= 1\frac{1}{2} \end{aligned}$
	<p>Fraction Discs Fraction Strips</p>	<p>Drawings diagrams models</p>	

Teaching Concept: C-P-A approach

Concept	Concrete	Pictorial	Abstract
	Template		

Math Problem Solving Steps

UNDERSTAND

- the problem



CHOOSE

- a strategy



SOLVE

- the problem



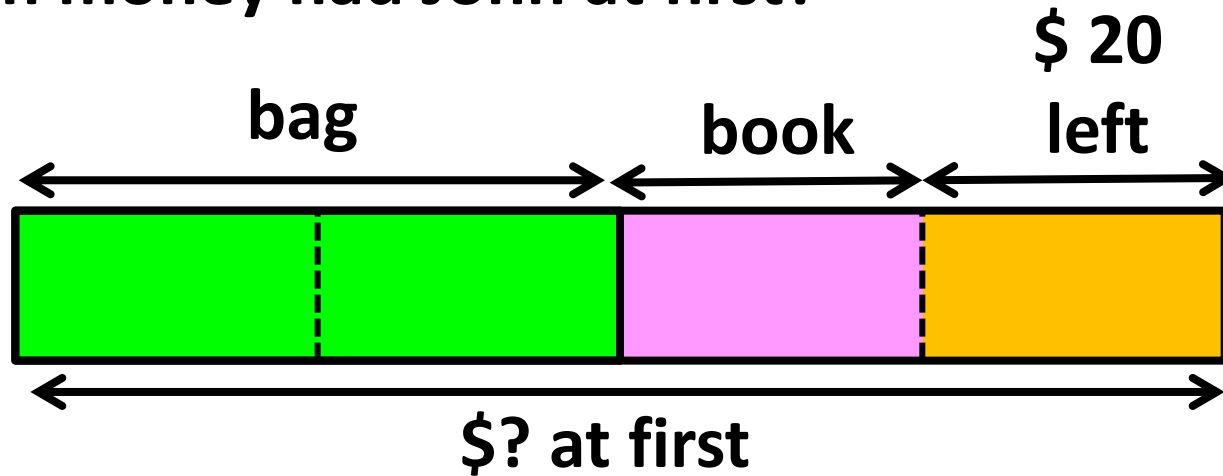
CHECK

- Reasonableness
the solution



After John spent $\frac{1}{2}$ of his money on a bag and $\frac{1}{4}$ of it on a book, he had \$20 left.

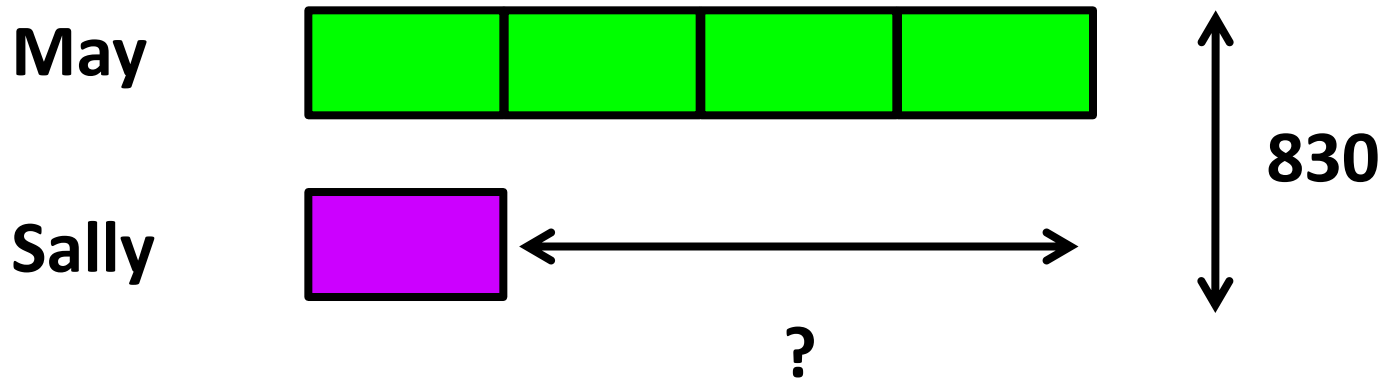
How much money had John at first?



$$\begin{aligned} 1 \text{ unit} & \text{ — } \$20 \\ 4 \text{ units} & \text{ — } 4 \times \$20 \\ & \text{ = } \$80 \end{aligned}$$

John had \$80 at first.

May and Sally have 830 balloons altogether. May has 4 times as many balloons as Sally. How many fewer balloons does Sally have than May?



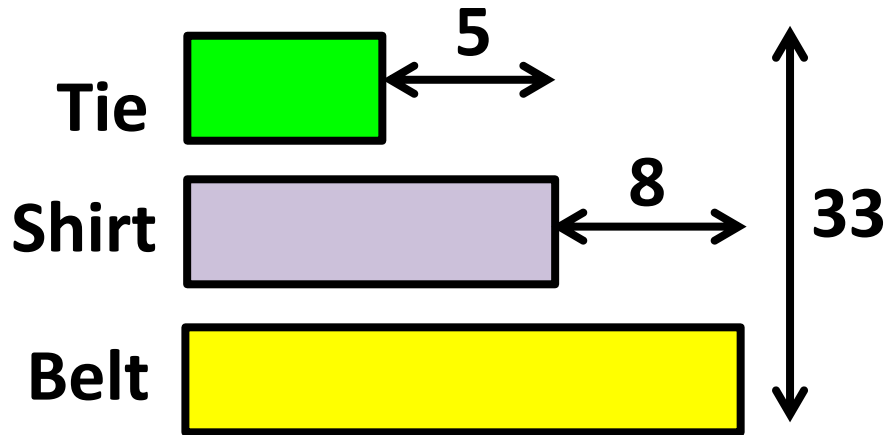
$$5 \text{ units} \text{ — } 830$$

$$1 \text{ unit} \text{ — } 830 \div 5 \\ = 166$$

$$3 \text{ units} \text{ — } 3 \times 166 \\ = 498$$

Sally has 498 fewer balloons than May.

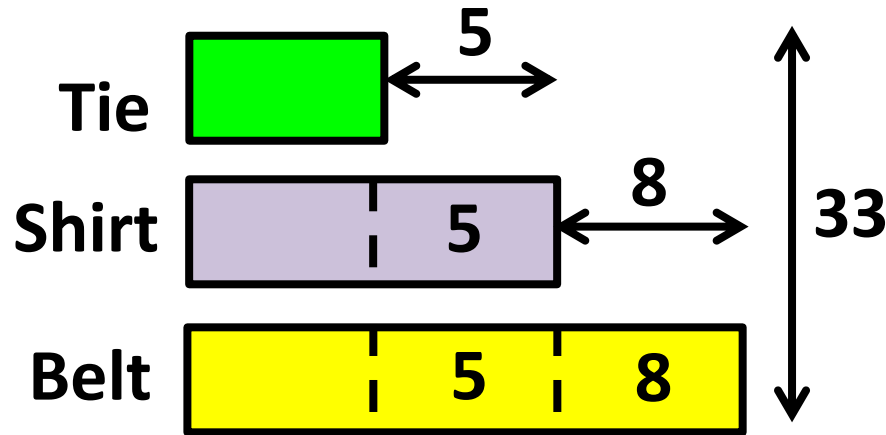
Sam spent \$33 on a shirt, a belt and a tie.
The shirt cost \$5 more than the tie.
The belt cost \$8 more than the shirt.
How much did the belt cost?



$$3 \text{ units} - 33 - 5 - 8 = 20$$

$$1 \text{ unit} - 20 \div 3 = 6 \text{ R } 2 \quad X$$

Sam spent \$33 on a shirt, a belt and a tie.
The shirt cost \$5 more than the tie.
The belt cost \$8 more than the shirt.
How much did the belt cost?



$$3 \text{ units} - 33 - 5 - 5 - 8 = 15$$

$$1 \text{ unit} - 15 \div 3 = 5$$

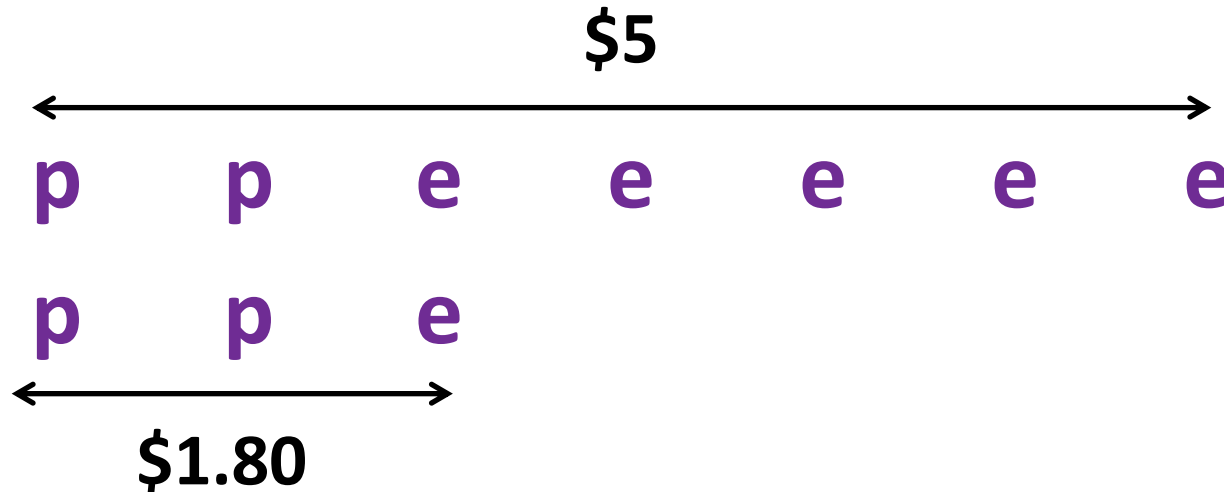
$$\text{Cost of Belt} - 5 + 5 + 8 = 18$$

The belt cost \$18.

The cost of 2 pencils and 5 erasers is \$5 altogether.

The cost of 2 pencils and 1 eraser is \$1.80.

What is the cost of one eraser?



Cost of 4 Erasers ——— $5 - 1.80 = 3.20$

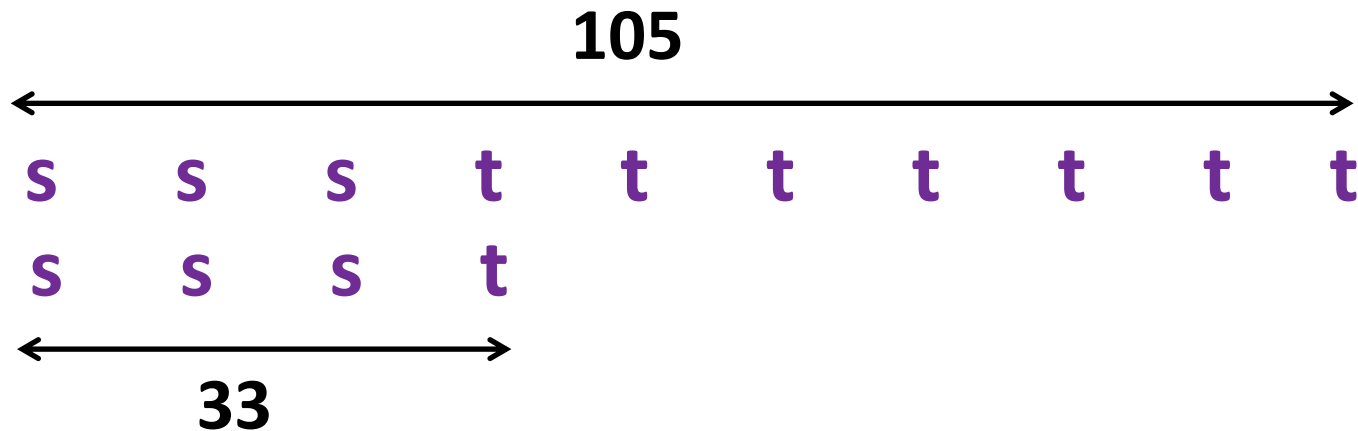
Cost of 1 Eraser ——— $3.20 \div 4 = 0.80$

One eraser costs \$0.80.

Three pairs of shorts and 7 T-shirts cost \$105.

Three pairs of shorts and 1 T-shirt cost \$33.

What is the cost of each T-shirt?



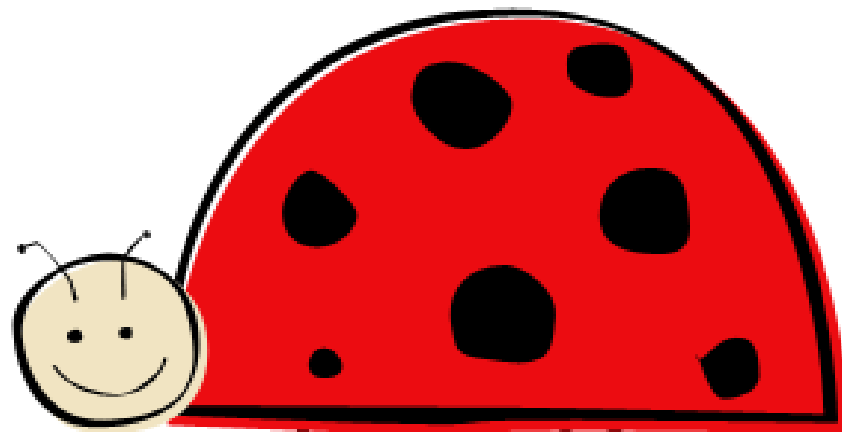
Cost of 6 T-shirts ——— $105 - 33 = 72$

Cost of 1 T-shirt ——— $72 \div 6 = 12$

The cost of each T-shirt is \$12.

Meeting your child's needs

- Speak to the feelings of the child;
“I – care – about – you – relationship”
- Try to be flexible, caring, responsive, non-threatening, and *never give up* on them
- Allow your child to proceed at a pace that will motivate and challenge but not frustrate them
- Speak their level of language



Thank You