

# 2 What's wrong?

In "What's wrong?" pupils are provided with an opportunity to use their critical thinking skills. They are presented with a problem and its solution. However the solution contains an error, either conceptual or computational. The pupil's task is to discover the error, correct it and then explain what was wrong, why it was wrong and what was done to correct the error (Krulik and Rudnick, 1999). The teacher must ensure that pupils are engaged in class discussion after completing the task either in small groups or individually so that they hear ways of solving problems that differ from their own. Furthermore the group interaction that occurs during these discussions often leads to deeper mathematical understanding (Krulik and Rudnick, 2001). Such tasks are not difficult for teachers to craft as they are constantly exposed to such errors pupils make in class and in their written assignments.

## EXAMPLE 1

### Prize money

John and Henry won a prize of \$500 at a Charity Fair. With the money, John bought a bicycle for \$140. On their way home they decided to share the prize money equally.

Ali's solution:-  
$$\$500 - \$140 = \$360$$
$$\$360 \div 2 = \$180$$
Each person gets \$180

There is something wrong with Ali's solution.

1. Show how you would find the answer to the problem.
2. Explain the mistake in Ali's solution.

## EXAMPLE 2

Mr Tan's trip

A taxi charges:

For the first 1.5 km	\$2.40
For every additional 100 m	\$0.10

Mr Tan paid \$12.00 for his taxi ride.  
He thought his trip was 14.4 km long.

David's solution:-  $\$12.00 - \$2.40 = \$9.60$   
 $\$9.60 \div \$0.10 = 9.6$   
 $9.6 \times 1.5 = 14.4$

There is something wrong with David's solution.

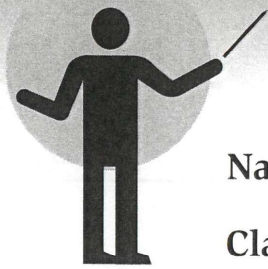
1. Show how you would find the answer to the problem.
2. Explain the mistake in David's solution.

**Teaching Goal**

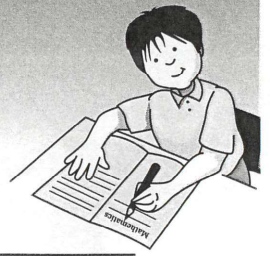
After participating in this lesson, pupils will be able to identify the reasoning error presented in the problem. Pupils will also choose a representation, either visual or numerical, and use it to solve the problem.

**Teaching Plan**

1. Present the problem to the pupils.
2. Have pupils read the problem individually.
3. Engage the whole class in a discussion and check for comprehension of the problem.
4. Give pupils time to complete the problem.
5. Ask a few pupils to present their solutions.
6. Engage the whole class in explaining the reasoning underlying the error in the given solution.



# What's wrong?



Name: \_\_\_\_\_ Date : \_\_\_\_\_

Class : \_\_\_\_\_ Levels 3 - 6

1

Topic: Money - Word Problem

Savings

Caili saved \$6.85.

She saved \$1.25 more than her sister.

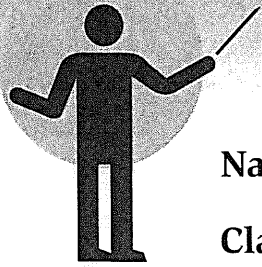
How much did the two girls save in all?

Susan's solution:-  $\$6.85 + \$1.25 = \$8.10$   
 $\$8.10 + \$6.85 = \$14.95$   
The two girls saved \$14.95 in all.

There is something wrong with Susan's solution.

1. Show how you would find the answer to the problem.
2. Explain the mistake in Susan's solution.

Created by Pearly Tan



# What's wrong?



Name: \_\_\_\_\_ Date : \_\_\_\_\_

Class : \_\_\_\_\_ Levels 3 - 6

2

Topic: Numbers

People at a parade

5000 people were watching a parade.

3845 were children and the rest were adults.

How many more children than adults were there?

John's solution:-  $5000 - 3845 = 1155$

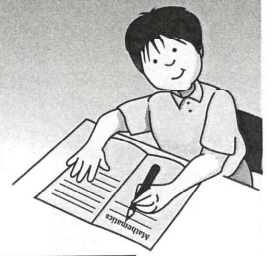
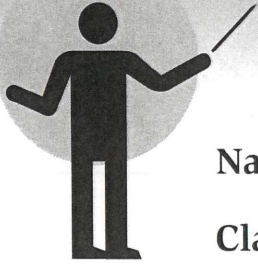
There were 1155 more children than adults.

There is something wrong with John's solution.

1. Show how you would find the answer to the problem.
2. Explain the mistake in John's solution.

Created by Pearly Tan

# What's wrong?



Name: \_\_\_\_\_ Date : \_\_\_\_\_

Class : \_\_\_\_\_ Levels 4 - 6

3

Topic: Fractions

Tom's expenditure

Tom had \$360. He spent  $\frac{1}{4}$  of it on a bag and  $\frac{1}{3}$  of the remainder on a shirt.  
How much did Tom spend altogether?

Jamie's solution:-  $\frac{1}{4} \times \$360 = \$90$

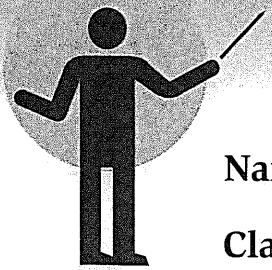
$$\frac{1}{3} \times \$360 = \$120$$

$$\$90 + \$120 = \$210$$

There is something wrong with Jamie's solution.

1. Show how you would find the answer to the problem.
2. Explain the mistake in Jamie's solution.

Created by Evelyn Chee



# What's wrong?



Name: \_\_\_\_\_ Date : \_\_\_\_\_

Class : \_\_\_\_\_ Levels 5 - 6

4

Topic: Time

Homework

Ali planned to complete his homework in  $1\frac{1}{2}$  h.

However, he finished his homework in  $1\frac{1}{3}$  h.

How much earlier did he finish his homework?

(Express your answer in minutes)

Peter's solution:-

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

$$= \frac{3}{6} - \frac{2}{6}$$

$$= \frac{1}{6}$$

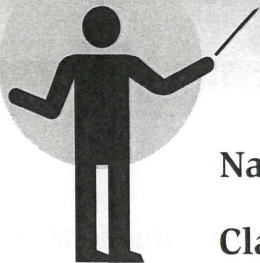
He was 6 mins earlier.

There is something wrong with Peter's solution.

1. Show how you would find the answer to the problem.
2. Explain the mistake in Peter's solution.

Adapted from : Shaping Maths (Activity book, 5A Part I, Q2, pg 51)  
by Teo Yuen Cheng

# What's wrong?



Name: \_\_\_\_\_ Date : \_\_\_\_\_

Class : \_\_\_\_\_ Levels 5 - 6

5

Topic: Money

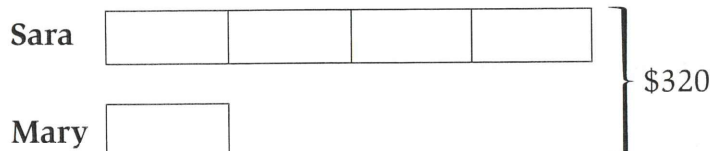
Mary and Sara

Mary and Sara had \$320.

If Mary gave Sara \$30, Sara would have thrice as much money as Mary.

How much money does Sara have?

Muthu's solution:-



5 units  $\longrightarrow$  \$320

1 unit  $\longrightarrow$  \$64

Amount of money Mary has  $\longrightarrow$  \$64 + \$30  
= \$94

Amount of money Sara has  $\longrightarrow$  \$320 - \$94  
= \$226

Sara has \$226.

There is something wrong with Muthu's solution.

1. Show how you would find the answer to the problem.
2. Explain the mistake in Muthu's solution.

Created by Ng Ying Mindy