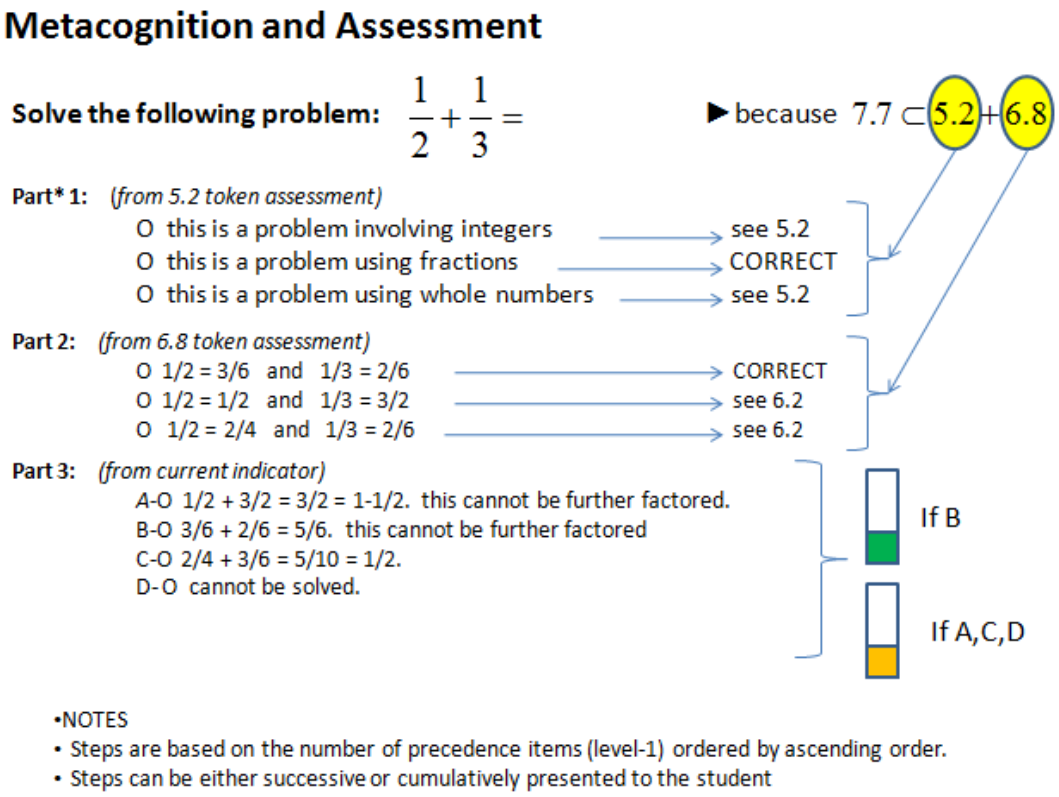
Metacognition and Assessment

Once an accurate[1] scaffold has been created, progressive and iterative validation occurs through real-time metric evaluation (see Section on "Metric Evaluators").

Assessment, then, is a progressive assessment down the benchmark scaffold[2] to determine relative comprehension of learning objectives. This iterative assessment can be defined using the following operational example:



Analysis of the baseline assessment then occurs as follows:

[1] aligned and validated.
[2] hierarchal benchmark tree

Pedagogic Analysis

7.7: Solve the following problem: $\frac{1}{2}+\frac{1}{3}=$

Part 1: *(from 5.2)*

O this is a problem involving integers	see 5.2
O this is a problem using fractions	CORRECT
O this is a problem using whole numbers	see 5.2

Part 2: *(from 6.8)*

O 1/2 = 3/6 and 1/3 = 2/6	CORRECT
O 1/2 = 1/2 and 1/3 = 3/2	see 6.8
O 1/2 = 2/4 and 1/3 = 2/6	see 6.8

Part 3: *(from current indicator)*

O 1/2 + 3/2 = 3/2 = 1-1/2. this cannot be further factored.
O 3/6 + 2/6 = 5/6. this cannot be further factored
O 2/4 + 3/6 = 5/10 = 1/2.
O cannot be solved.

▶ because $7.7 \subset 5.2+6.8$

Metacognative Comprehension
(7.7 – N=9 students)

▶ **Have got it**
- DOE, Jane
- SMITH, Sam

▶ **Missed it**
- REILLEY, Key

▶ **missing** 6.8
- AUSTIN, Pete
- JANE, Sally
- O'SMITH, Sam

▶ **missing** 5.2
- JENKINS, Pete
- DESKLOSKI, Sam
- DONNELLY, Alton

Metacognative Assessment Example

7.7: 1/2 + 1/3 = ?

Question 7.1 is metacognative analyzed following the hierarchal precedence learning order.

Part1: both 1/2 and 1/8 are :
- ☐ WHOLE NUMBER
- ☐ FRACTION
- ☐ REAL NUIMBER
- ☐ ? – I don't know

▶ because $7.7 \subset 5.2+6.8$

Part 3 We are:
- ☐ ADDING 2 FRACTIONS
- ☐ SUBTRACTING 2 FRACTIONS
- ☐ MULTIPLYING 2 FRACTONS
- ☐ ? – I don't know

Part 4: ***The FIRST thing we do to solve this problem is:***
- ☐ FIND THE COMMON DENOMINATOR
- ☐ JUST ADD THEM UP
- ☐ USE A GRAPHIC AID TO DRAW OUT THE ANSWER
- ☐ ? – I don't know

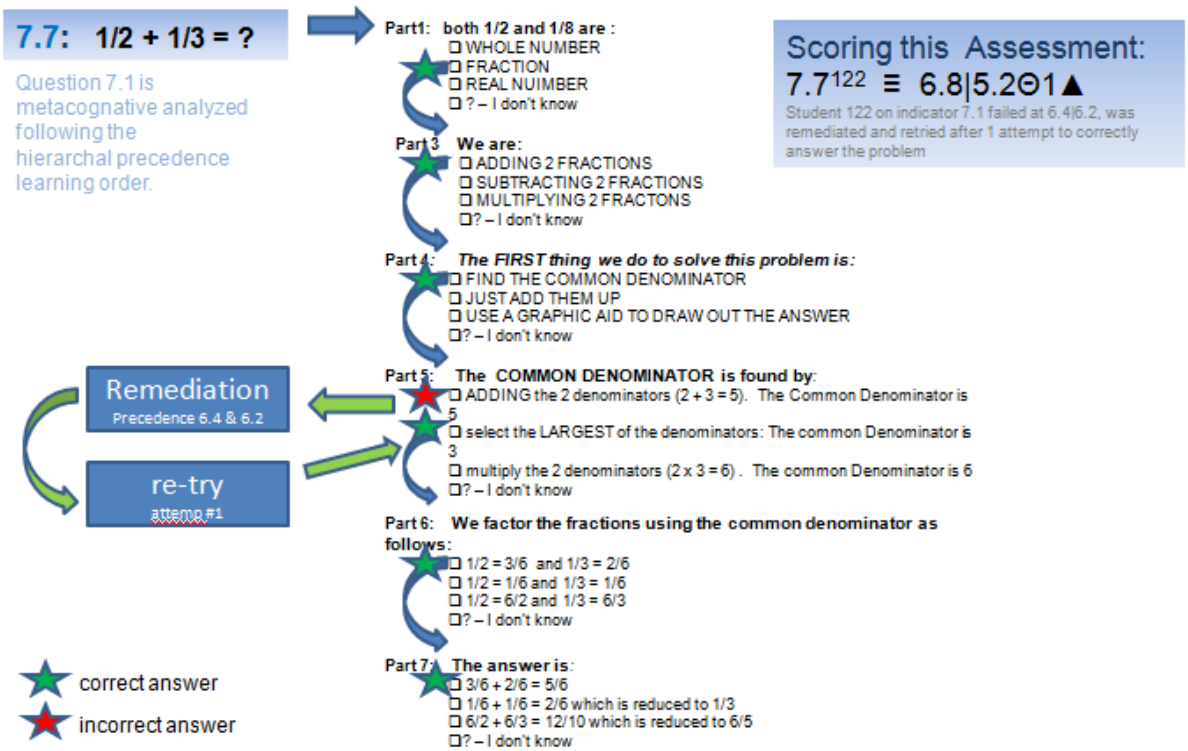
Part 5: The COMMON DENOMINATOR is found by:
- ☐ ADDING the 2 denominators (2 + 3 = 5). The Common Denominator is 5
- ☐ select the LARGEST of the denominators: The common Denominator is 3
- ☐ multiply the 2 denominators (2 x 3 = 6) . The common Denominator is 6
- ☐ ? – I don't know

Part 6: We factor the fractions using the common denominator as follows:
- ☐ 1/2 = 3/6 and 1/3 = 2/6
- ☐ 1/2 = 1/6 and 1/3 = 1/6
- ☐ 1/2 = 6/2 and 1/3 = 6/3
- ☐ ? – I don't know

Part 7: The answer is:
- ☐ 3/6 + 2/6 = 5/6
- ☐ 1/6 + 1/6 = 2/6 which is reduced to 1/3
- ☐ 6/2 + 6/3 = 12/10 which is reduced to 6/5
- ☐ ? – I don't know

Metacognative Assessment Model Analysis

Example of single assessment logic



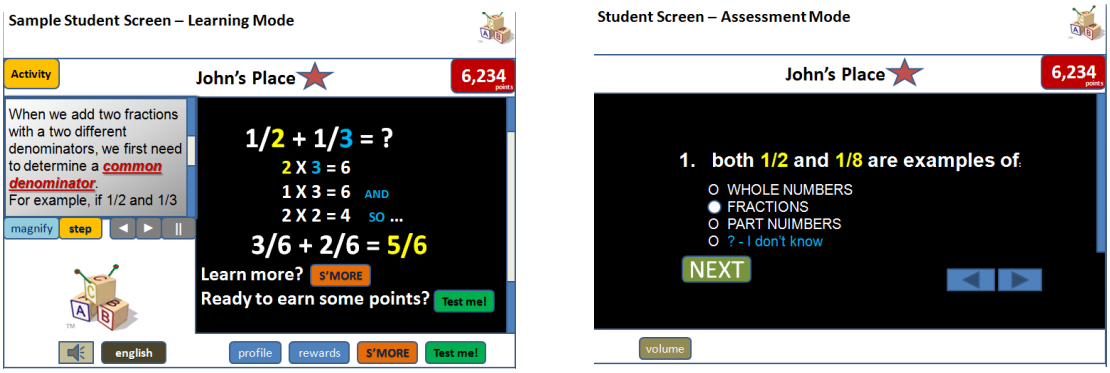


Figure 1: examples of student assessment screens (P2L implementation)