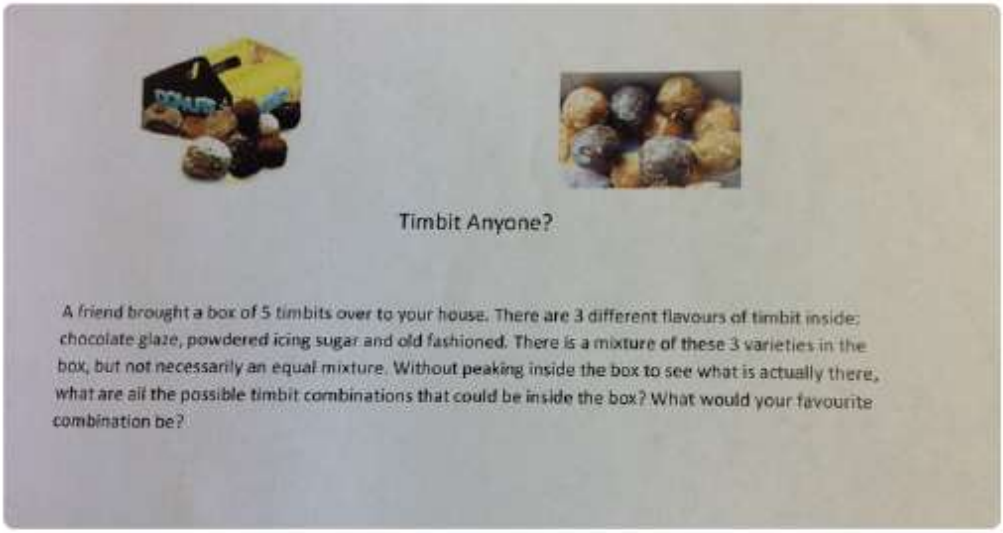
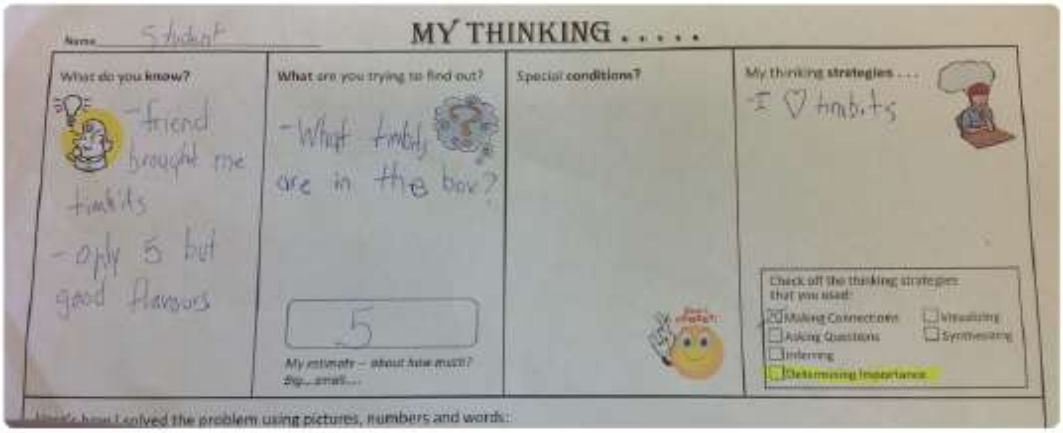
Math problem



Formative assessment:

After reading the timbit problem, we noticed that many students could not Determine Importance to complete the KWC. The students were saying, "I don't get it. What do I do to solve it?"

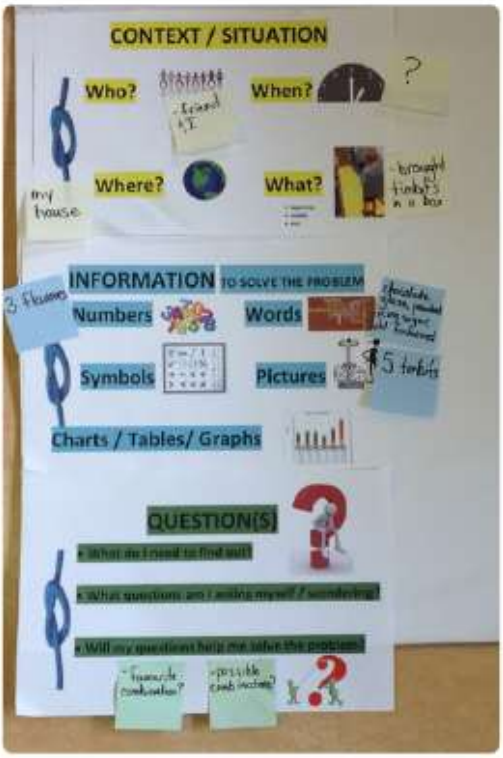


Instead of providing an operation, or problem-solving strategy, we slowed down the learning and focused on understanding the problem. Our lesson focus became:

Determine Importance - Lesson

Math problems consist of 3 parts:
*the context/situation,
*information,
*question(s)

Please note that Polya also advises that we spend 75% of our time understanding the problem before spending 25% of our time solving it!!!



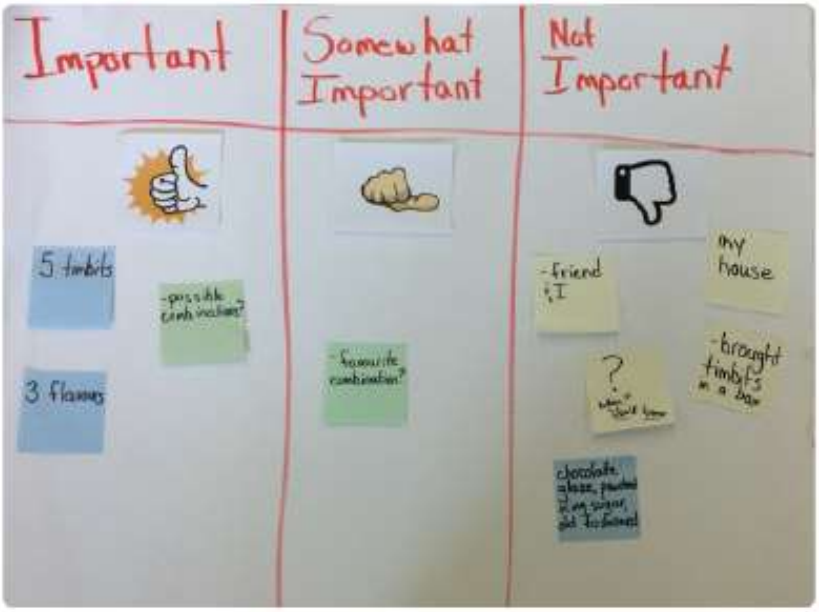
So, in order to determine importance, we did a re-tell of these 3 parts of the problem. We did this as a class with post-it notes and a poster paper.
As we did the retell, we wrote the context points on yellow stickies, the information points on blue stickies and the question(s) on green stickies.

These are our sticky notes that re-tell the math problem through context/ information/ question.

In order to determine importance, we then considered and classified each sticky note as being important, somewhat important or not important to the math problem. Through class discussion, students showed what their personal judgement was by showing: their thumb up (important), thumb sideways (somewhat important), or thumb down (not important).

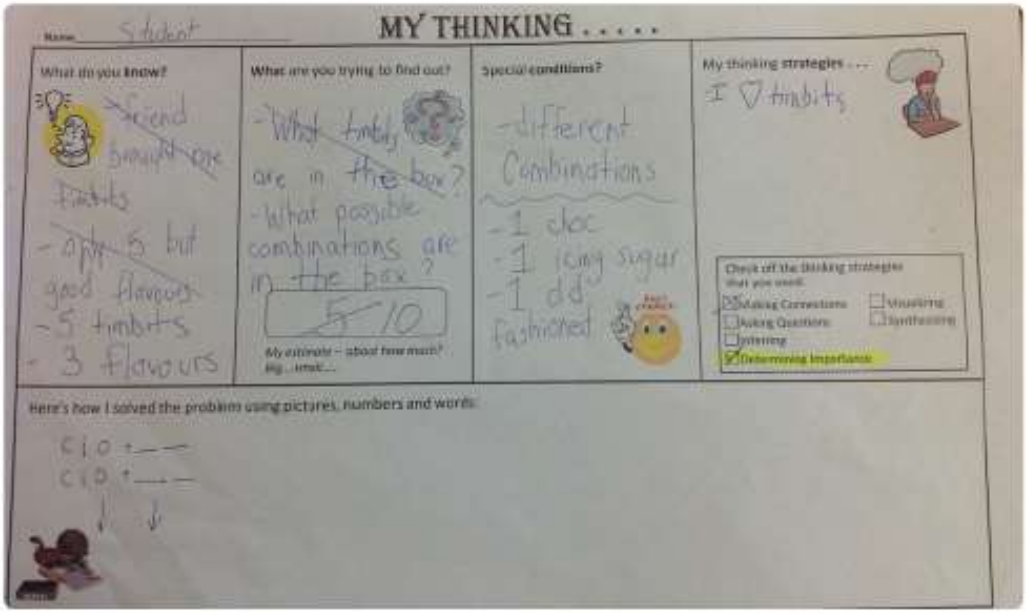
We often used another thinking strategy, Asking Questions to figure out if a point is important:
*Is this important in solving the math problem?
*If we change this "detail" in the math problem, will it change the math problem?

As we classified importance, as a whole class, we recorded it on a chart.



From the chart, we were able to visualize that our important information comes from the information (blue stickies) and the question (green sticky) part of the math problem.
The context is often interesting, but not important. However, many students get tied up in their thinking about the context. Once they can focus on the important information, they can complete the rest of the KWC.

These are the changes this student made to their KWC after determining importance.



*Note that this student could write down what she knew, what she is trying to find out and a beginning step in solving after she spent the time to Determine Importance!

Solution

Solution

chocolate glaze (c)

powdered icing sugar (i)

old fashioned (o)

c	c	i	i	o
c	c	i	i	o
c	i	i	c	o
c	c	i	o	o
c	i	o	o	o
c	i	i	i	o

Students might also build this pattern with 3 different colours of tiles, or represent it with symbols, such as ● ● ▲ ▲ ★

There are 6 different combinations possible

I know that I have all of the combinations because:

If all 3 types are present, then the maximum number of 1 type in any combination will be 3.

For each type of timbit, there are:

*** 3 combinations where the timbit occurs once

** 2 combinations where the timbit occurs twice

*1 combination where the timbit occurs three times

If we count all of the chocolate in all 6 combinations, there are 10 chocolate timbits.

If we do the same for each of the 3 flavours, we find that there are 10 of each flavour to make all of the 5 possible combinations.

The **repeating core** of chocolate, powdered icing sugar, old fashioned can be used while determining all combinations with the remaining 2 variations / variables:

c,i,o,c,c

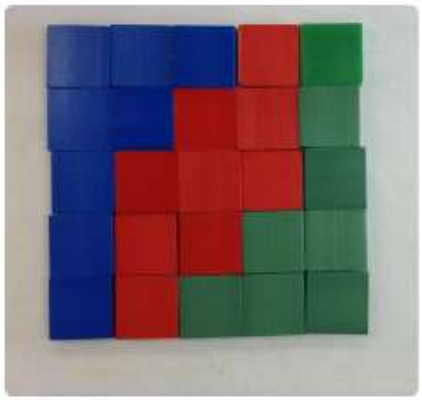
c,i,o,i,i

c,i,o,o,o

c,i,o,c,i

c,i,o,c,o

c,i,o,i,o



Timbit combinations built with tiles

Students were very engaged because they understood the problem and felt confident in finding a way to solve the problem. Many students built it with tiles, others used symbols/letters. All students reasoned to determine all 6 combinations and most were able to identify the repeating core and find/ explain the patterns in the combinations.