

Diagrams and fractions - lesson 2.2 - Adding $\frac{1}{2}$, $\frac{1}{4}$...

Summary

In this lesson, the students will actually calculate the result of an addition of fractions (both with powers of 2 as denominator). To do so, they will have to break the biggest fraction into many pieces equal to the smallest fraction. At first, they will have the diagram, then they will have to produce the diagram for a given sum.

Material: video, worksheets, notebook with the diagrams and one sheet with blank grids for each student.

Outline of the lesson

Starter

The student will have to match equivalent fractions with the diagrams. Each item was chosen based on previous observations.

This task may be used as starter, without much initial input from the teacher. However, it is important that the teacher discuss the solutions once visualizing equivalent fractions will be of utmost importance for the rest of the lesson.

The last fraction on lines 3 and 4 may be particularly difficult. You can suggest to the students to leave them to the end.

Video

The video shows how to compute the addition of fractions using the rectangular area model.

You may show it more than once and add some comments if you think it is a good idea.

For example, you could comment on the opening "scene" that the square is clearly $\frac{1}{4}$ and the rectangle is clearly $\frac{1}{8}$, however it is not clear what fraction they represent together. So, it is necessary to transform one of the fractions into the other as you will see in the video...

Task 1

The first task asking them to add fractions. It shows the sums in diagrams, exactly as shown in the video.

When helping the students, encourage them to register the steps of their solutions, such as the unit fractions over the pieces in the diagram.

Task 2

Now, the sums are given symbolically and they are expected to draw the diagram and solve the sums.

None of the items is expected to be particularly difficult.

Task 3

This task introduces subtraction.

The lack of structure is intentional to see if they will use the same structure presented before.

Extension

First, give a sum without any sort of diagram to see if they will use the same structure, such as $\frac{1}{2} + \frac{5}{16}$.

Second, give a subtraction involving the unit, such as $1 - \frac{3}{8}$. I suspect that some students will have problems to work with the unit instead of two fractions.

Another possibility is to give a sum with three fractions, such as: $\frac{1}{4} + \frac{3}{8} + \frac{1}{16}$.