

Diagrams and fractions - lesson 1 - Introducing the area model

Summary

The objective of this lesson is to introduce comparisons between different shapes using actual shapes cut in card paper. These comparisons will lead us to fractions in upcoming lessons.

Once this is the first lesson using this approach, the students will not deal directly with fractions, only with the shapes comparing their sizes and establishing relationships. Also, experience showed that fitting pieces one into another (rotating and reflecting them to do so) is quite challenging for the students. Therefore, it is important to give some time to them to get used to these actions.

Material: each student should receive one copy of the worksheet, but each group will receive only one bag of pieces (with 1 white, 5 greens, 4 pinks, 10 reds, 12 yellows, 10 blues).

Outline of the lesson

Task 1

The goal is to introduce the pieces and how to compare their sizes with the size of the biggest one (white square, the unit).

This table will be re-utilized in the next lesson.

The students will receive enough green, blue and pink pieces to actually cover the square. However, they will not have enough of the red and yellow. The reason is to force them to extrapolated the quantities needed: if I need 8 to cover half, how many do I need to cover the whole?

Extra question: if I cut the green into 3 equal parts, how many of these new piece would I need to cover the white square?

Task 2

The goal of this task is to introduce comparison between different pieces. Hopefully, this will lead the students to conclusions such as "one eighth is half of one quarter", which is in the core of important concepts such as equivalent fractions.

Some of the comparisons can be done directly (green and blue), but other can not because of the shape of the pieces (red and blue). For those cases, they may use a third piece as reference (4 reds and 4 blues fit easily into 1 green) or more than one of the original pieces (2 blues fit easily into 2 reds).

The order of the questions was chosen in such way that the previous answers can help them in those indirect comparisons.

Task 3

This task is a continuation of the previous in terms of its goal.

The second part of it is particularly important to promote literacy and give some space for the students to express what they got from the activity so far.

Make sure that the students actually exchange worksheets and discuss the answers of each other.

Challenge

This task is not important for further lessons because the dimensions of the purple piece is not easily comparable with the white square. However, the question is challenging for the students that have eventually finished the main tasks.

The answer is 8, but it is impossible to do it directly. Instead, you have to use some yellows (8 yellows + 4 purples) and then combine that with 2 yellows = 1 purple.