

Session 9 A - Case Study – Part Whole

Guided by the evidence in the OGAP pre-assessment Mr. Purple, a fourth grade teacher, decided that his students needed experience on how to find the fractional part of an area or a set of objects when the number of parts in the whole is a multiple of the denominator.

He decided that the best way to make the transition from problems where the number of parts in the whole is equal to the denominator to those that are a multiple of the denominator was to have students interact with models in which the number of columns is equal to the denominator.

Mr. Purple started the class by putting the two Figures A and B below on the board and asking students how these figures are alike and how they are different.



According to Mr. Purple students immediately noticed that both figures had the same number of columns. They also noticed that the rectangles were not the same size and did not have the same number of parts.

The teacher then shaded in $\frac{3}{5}$ of Figure A and asked the students to shade in $\frac{3}{5}$ of Figure B. The students were excited. They easily shaded $\frac{3}{5}$ of Figure B by shading the same number of columns in figure B. In fact, students made the observation that no matter how many rows Figure B has they can shade three columns to get $\frac{3}{5}$ of the figure.



Mr. Purple was very excited. He thought his students were beginning to understand how to find the fractional part of an area when the number of parts in the whole is a multiple of the denominator.

Mr. Purple then gave the students a worksheet with five sets of figures like Figures A and B above. As Mr. Purple walked around the room he noticed that students were successful with the questions on this worksheet.

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At the end of the class Mr. Purple gave the following exit question to his students.

Exit Question:

Shade $\frac{5}{8}$ of Figures A, B, and C.

Figure A



Figure B

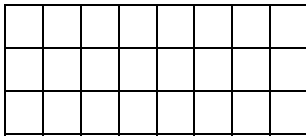
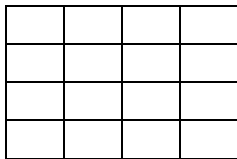


Figure C



Every student correctly shaded Figures A and B. However, only a few of the students correctly shaded Figure C and almost half the class said that you cannot shade $\frac{5}{8}$ of Figure C because the number of columns does not equal the denominator.

Mr. Purple has come to your team meeting for advice. He realized he may have made a mistake just focusing on the feature of the number of columns. However, he also realizes that he is unsure how to help his students find the fractional part of an area (or set of objects) when the number of parts is a multiple of the denominator.

- 1) What advice can you give to Mr. Purple about what to do next and how to find the fractional part of an area or set of objects when the number of parts in the whole is a multiple of the denominator?

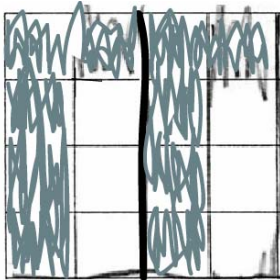
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Mr. Purple brought some other student work to discuss with the group. All the responses had the correct answer, but all used different strategies to solve the problem. He wondered if it mattered if the strategy used to solve the problem was different as long as they arrived at the correct answer. Review the pieces of student work and then respond to the questions below.

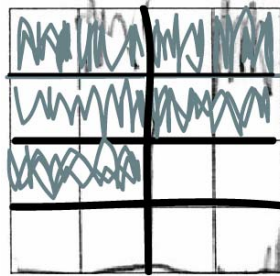
- 2) Even though Thomas and Karen responded to different problems, how are their responses similar? According to the OGAP Fraction Framework are they using a Transitional or a Flexible strategy? What is the evidence? Why do you think the strategies they used are classified that way?
- 3) Even though Dyson and Sara responded to different problems, how are their responses similar? According to the OGAP Fraction Framework are they using a Transitional or a Flexible strategy? What is the evidence? Why do you think the strategies they used are classified that way?
- 4) Explain to Mr. Purple, using evidence from these pieces of student work, why the strategy a student uses to solve a problem matters even when they get a correct answer.

Shade $\frac{5}{8}$ of the figure.

Thomas's Response



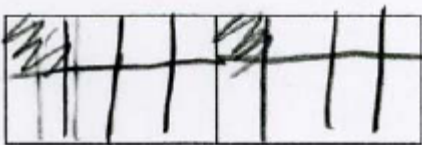
Dyson's Response



Shade $\frac{1}{8}$ of the rectangle below.

Karen's Response

Shade $\frac{1}{8}$ of the figure below.



Sara's Response

Shade $\frac{1}{8}$ of the figure below.

