Lesson Study and Formative Assessment

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Take aways

- The "essence" of formative assessment is the "relentless" attention to evidence of student thinking and understanding, and the intentional and systematic use of the evidence for planning and instruction (Popham, 2012)… day to day and minute to minute!
- Lesson study is an ideal vehicle to develop the systematic use of formative assessment in practice.

Modified Lesson Study Process

Lesson Planning

Lesson Delivery

Lesson Debriefing

Formative Plays a Critical Role in each Aspect of the Lesson Study Process

Lesson Planning

1) Analyzing student work to inform goal and planning
2) Instructionally embedded questions linked to instructional goal
3) Designing an 'exit' question to inform next steps

Lesson Delivery

1) **Teacher is** paying constant attention to student products and in discussion of evidence of student thinking to inform their 'minute to minute' decisions.

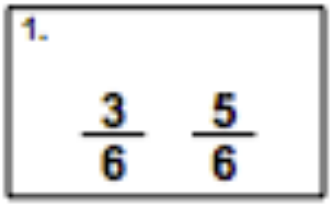
Lesson Debriefing

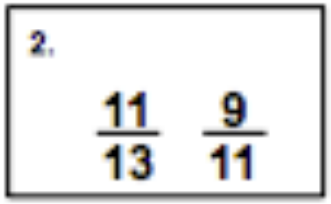
1) Analyze evidence from 'exit card'
2) Gather evidence from observers of student thinking
3) Plan the goal for the next lesson and next instructional steps

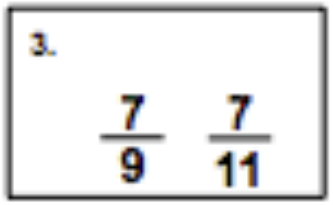
Planning

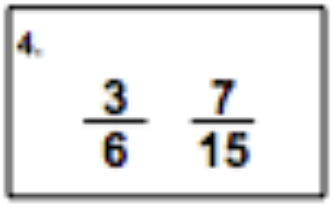
- Teacher engagement in the mathematics (formative for facilitator)
- Develop mathematical goal
- **Analyze evidence in student work to inform goal and planning**
- Revisit the goal
- Develop action steps of lesson tied at the hip the goal
- **Develop probing questions for each aspect of the lesson**
- **Select and sequence student work to strengthen understanding tied directly to the goal**

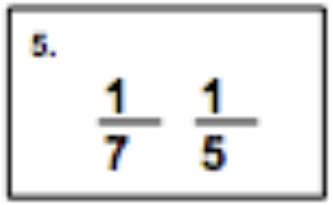
Engage in Mathematics

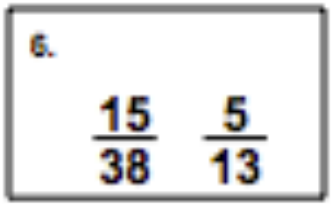


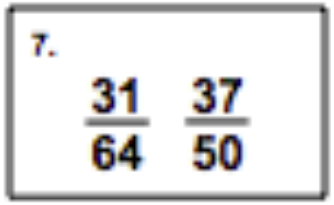


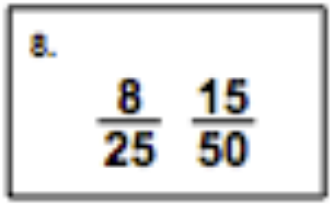


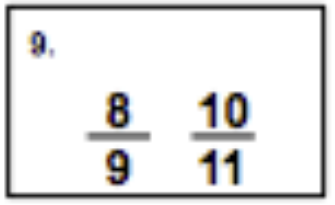












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Engage in Mathematics

1. $\frac{3}{6}$ $\frac{5}{6}$

2. $\frac{11}{13}$ $\frac{9}{11}$

4. $\frac{3}{6}$ $\frac{7}{15}$

5. $\frac{1}{7}$ $\frac{1}{5}$

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Mathematical Goal of Lesson

- To use visual models to compare and order proper fractions

Put these fractions in order from least to greatest.
Explain your reasoning.

$\frac{7}{8}$ $\frac{7}{10}$

- Sort student work into PILES by the strategy/reasoning evidenced in the work
- Make notes describing the patterns of evidence in each pile.
- Be prepared to discuss how this evidence will influence the goal

How is the explanation in C reflected in the number line solution in B?

C

Put these fractions in order from least to greatest.
Explain your reasoning.

$\frac{7}{8}$ $\frac{7}{10}$

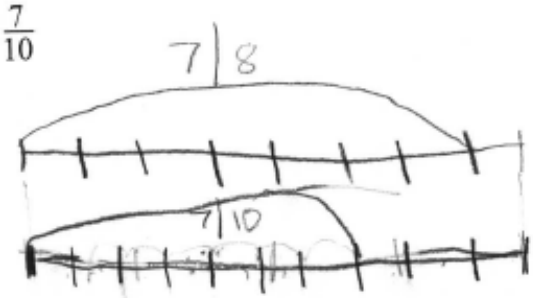
$\frac{7}{10}$, $\frac{7}{8}$

I think this because the numerators are equivelent so I looked at the denomenators and 8's are larger than 10's so I knew it goes $\frac{7}{10}$ $\frac{7}{8}$ ⇖ least to greatest

B

Put these fractions in order from least to greatest.
Explain your reasoning.

$\frac{7}{8}$ $\frac{7}{10}$



7/10 < 7/8

Mathematical Goal of Lesson

Original Goal: To use visual models to compare and order proper fractions

Revised Goal based on evidence: To use visual models to understand how to use benchmark and unit fraction reasoning when comparing and ordering fractions.

Body of Lesson Description

To accomplish the goal Ms. Smith engaged the students in a number of comparison problems using familiar fractions (e.g., Which is greater? $\frac{1}{3}$ *or* $\frac{3}{4}$?) by making visual models. She then had students compare unit fractions and fractions in which unit fraction reasoning could be used (e.g., Which is closest to 0? $\frac{1}{3}$ *or* $\frac{1}{4}$? $\frac{4}{5}$ *or* $\frac{3}{4}$?) using visual models. After solving these and other similar problems students were asked to make observations about their visual models (both number lines and visual area models). Many students started to discuss the relationship between the size of the parts in the whole and the magnitude using unit fraction reasoning.

Exit Question Design

Similar to what students did during class.

1) Which fraction is closest to 0? Show work.

$\frac{1}{3}$ $\frac{1}{5}$

2) Which fraction is closest to 1? Show work.

$\frac{3}{4}$ $\frac{2}{3}$

Extend their reasoning/ understanding

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Which fraction is closer to $\frac{1}{2}$?

$\frac{3}{4}$ *or* $\frac{5}{12}$

Explain your thinking.

Which fraction is closer to $\frac{1}{2}$?

$\frac{3}{4}$ *or* $\frac{5}{12}$

Explain your thinking.

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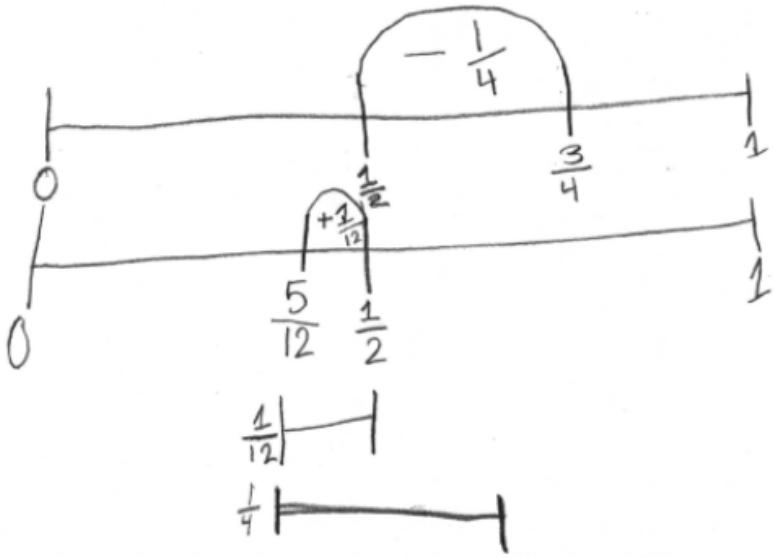

5/12 is only 1/12 away from 1/2 but 3/4 is 1/4 away from 1/2 and 1/4 is more than 1/12 so 5/12 is closer to 1/2 than 3/4

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- "This was the first and only time that I felt that I worked collaboratively with my peers on a common goal to develop student understanding through my instruction. It wasn't competitive and we just kept refining our thinking based on evidence in student work and what students were saying to try and maximize student learning." 2nd grade teacher

Citations

- Petit, & Laird, R., Hulbert, E. (2013). *Ongoing assessment project: Professional development materials.* Moretown, VT: Ongoing Assessment Project.

- Popham, W. J. (2012). *Forward*. In E. Wylie, A. Gullickson, K. Cummings, L. Noakes, K. Norman, & S. Veeder (Eds.), *Improving formative assessment to empower student learning* (pp. ix-xii). Thousand Oaks, CA: Corwin Press.