

Anchor Paper Scoring and Rationales - Task: Pouring Paints 1

Name: Student A

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of the concepts and skills associated with the task. The student organizes their work and uses their understanding of equivalent fractions and one whole in order to determine which two fractions would fill the cup. The student finds a correct solution for two fractions that could be combined without the cup overflowing.
Problem Solving	Proficient	The student's strategy of using fraction circles to show that $\frac{1}{4}$ is equivalent to $\frac{2}{8}$ and that $\frac{3}{4}$ and $\frac{2}{8}$ together would fill the entire circle shows an understanding of the underlying math concepts of combining two fractions that are less than or equal to 1 whole. The student produces a solution that is relevant to the problem.
Communication and Reasoning	Proficient	The student verbally communicates their thinking process in how they used fraction circles to make sense of the problem. The student uses evidence of equivalent fractions through models to support their argument. The student uses mathematical language of fraction notation and "whole."
Representations and Connections	Proficient	<p>The student's diagram demonstrates the use of representations that model the task and is accurate. The student's verbal description explains how the representation led to their solution.</p> <p>The student makes mathematically relevant connections such as "$\frac{2}{8}$ is equivalent to $\frac{1}{4}$" and "If I put these 2 blue pieces with the $\frac{3}{4}$ it is a whole cup."</p>

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Name: Student B

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Advanced	The student uses the relationship of the missing part of one whole in order to determine the sum of $\frac{1}{3}$ and $\frac{5}{10}$ being equivalent to $\frac{5}{6}$. The student demonstrates an understanding of the concepts and skills associated with the task. The student organizes their work and uses their understanding of equivalent fractions and one whole in order to determine which two fractions would fill the cup. The student finds a correct solution for two fractions that could be combined without the cup overflowing.
Problem Solving	Proficient	The student's strategy of using fraction circles to show that the missing part of the cup would be $\frac{1}{6}$ and that means that $\frac{1}{3}$ and $\frac{5}{10}$ would be equivalent to $\frac{5}{6}$ shows an understanding of the underlying math concepts of combining two fractions that are less than or equal to 1 whole and finding the sum. The student produces a solution that is relevant to the problem.
Communication and Reasoning	Proficient	The student verbally communicates his thinking process in how he used fraction circles to make sense of the problem. The student uses evidence of equivalent fractions through models to support their argument. The student uses mathematical language of fraction notation, "full", and "whole."
Representations and Connections	Proficient	<p>The student's diagram demonstrates the use of representations that model the task and is accurate. Their verbal description explains how the representation led to the solution.</p> <p>The student makes mathematically relevant connections such as "$\frac{1}{3}$ and $\frac{5}{10}$ would work because together they are less than 1 whole" and "The space that is left to fill is $\frac{1}{6}$."</p>

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Name: Student C

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Emerging	The student demonstrates little understanding of fraction concepts. They show understanding of fractions being parts, but do not accurately model the fractions in a way that can be applied to find a solution. Her solution is incorrect.
Problem Solving	Developing	The student's strategy does not display an understanding of the underlying mathematical concept. The student's fractional drawing is inaccurate and the solution is not reasonable for the context of a cup that would not overflow. Their fraction choices of $\frac{5}{10}$ and $\frac{3}{4}$ do not equal one whole cup.
Communication and Reasoning	Developing	The student's reasoning is limited and contains misconceptions of fraction sense understanding. The student provides limited evidence in the form of an inaccurate picture to support their claim. The student uses limited mathematical language of "makes a full cup" to partially communicate her thinking, but with imprecision.
Representations and Connections	Developing	The student uses a limited representation to model the problem. They attempt to show both of their chosen fractions in the full cup but do so without full mathematical connections.

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Name: Student D

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of the concepts and skills associated with the task. The student organizes their work and uses their understanding of equivalent fractions and one whole in order to determine which two fractions would fill the cup. The student finds a correct solution for two fractions that could be combined without the cup overflowing.
Problem Solving	Proficient	The student’s strategy of “sliding” the $\frac{2}{8}$ up to fill the missing $\frac{1}{4}$ piece shows an understanding of the underlying math concepts of combining two fractions that are less than or equal to 1 whole. The student produces a solution that is relevant to the problem.
Communication and Reasoning	Proficient	The student verbally communicates her thinking process in how she used blank fraction bars to make sense of the problem. The student uses evidence of equivalent fractions through models to support their argument. The student uses mathematical language of fraction notation and “whole.”
Representations and Connections	Proficient	<p>The student’s diagram demonstrates the use of representations that model the task and is accurate. The student’s verbal description explains how the representation led to their solution.</p> <p>The student makes mathematically relevant connections such as “These two pieces are the same as $\frac{1}{4}$” and “If we slid them up they would make 1 whole.”</p>

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Name: Student E

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates a complete understanding of combining fractions by first considering that $\frac{1}{3}$ and $\frac{1}{5}$ together would be less a half, then realizing that the two together would be more than half but less than a whole after finding a common denominator. The student applies mathematical concepts of finding a common denominator to consider fractions that would be more and less than one whole.
Problem Solving	Advanced	The student's strategy of finding a common denominator is done efficiently as they use multiplication and numbers. The problem-solving strategy shows that he understands more and less than one whole. The student demonstrates the reasonableness of their solution by showing a non-example because of the improper fraction.
Communication and Reasoning	Advanced	The student's reasoning is comprehensive in their explanation of why fractions would work and why others would not work. The student uses precise mathematical language such as "an improper fraction is more than one whole" and " $\frac{16}{30}$ is more than half but less than a whole." In this, the student supports their arguments with specific evidence.
Representations and Connections	Proficient	The student's diagram and equations show how they are exploring and modeling the thinking process to the solution. The student makes mathematically relevant connections such as "in this case it overflowed because it's more than a cup."

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Name: Student F

Criteria	Performance Level (Advanced, Proficient, Developing, Emerging)	Rationale
Mathematical Understanding	Proficient	The student demonstrates an understanding of breaking up a fraction into smaller pieces in order to find twelfths. After finding the whole of twelfths, the student is able to provide an accurate solution because he recognizes that $\frac{1}{3}$ would be $\frac{4}{12}$ and in total that would be $\frac{9}{12}$ of a can.
Problem Solving	Proficient	The student's strategy of drawing fraction circles of thirds being cut into twelfths shows an understanding of the underlying math concepts of combining two fractions that are less than or equal to 1 whole and finding the sum. The student produces a solution that is relevant to the problem.
Communication and Reasoning	Proficient	The student verbally communicates his thinking process in how he used fraction circles to make sense of the problem. The student uses evidence of equivalent fractions through models to support his argument. The student uses mathematical language of fraction notation, "fills" and "cut thirds into twelfths."
Representations and Connections	Proficient	<p>The student's diagram demonstrates the use of representations that model the task and is accurate. Their verbal description explains how the representation led to his solution.</p> <p>The student makes mathematically relevant connections such as "I broke the thirds into twelfths" and "I counted the pieces shaded into to find $\frac{9}{12}$."</p>