

Student A

EQUIVALENCY ARGUMENT

Find a fraction equivalent to $\frac{3}{8}$. Use diagrams, equations, and mathematical principles to prove that the fractions are equivalent.

Make sure your argument includes a claim, evidence, warrants, reasoning and conclusion.

Claim: The answer is $\frac{6}{16}$

Evidence:

$$\frac{3}{8} = \frac{6}{16}$$

Warrant and Reasoning
 $\frac{6}{16}$ is the right answer because if you times ^{the fraction} it by $\frac{2}{2}$ (which is 1) you get $\frac{6}{16}$ it is the same because the numerator and the denominator ~~is~~ is times by $\frac{2}{2}$ so it will be the same value. Any thing ~~the~~ times 1 is the same value.

Conclusion: $\frac{6}{16}$ is equal to $\frac{3}{8}$ because $\frac{2}{2}$ is equal to 1 and anything times 1 is the same value so...

$$\frac{3}{8} \times \frac{2}{2} = \frac{6}{16}$$

so this why $\frac{3}{8}$ is equivalent to $\frac{6}{16}$

Commentary

This student's argument was categorized as **High Quality**.

Because this task was familiar for 6th graders, most students, including this one, were able to find a correct claim and provide evidence.

This student states that $\frac{2}{2}$ is equal to 1 and states that multiplying by one creates an equivalent value. Even though this example is brief, it included a clear claim, evidence, and warrant.

In general, High Quality arguments explicitly stated the warrant that multiplying by one doesn't change the value of the fraction. Students work with this concept for several years before 6th grade, and this warrant reflects deep understanding of equivalent fractions and strong support for creating equivalent fractions.

Argumentation Components

Claim	Evidence
<p>"The answer is $\frac{6}{16}$."</p> <p>Note: A clearer way to say this might be "$\frac{6}{16} = \frac{3}{8}$", but the claim is clear.</p>	<p>The student's evidence is the equation "$\frac{3}{8} \times \frac{2}{2} = \frac{6}{16}$".</p> <p>Note: Due to the brevity of the assignment, this is sufficient to support the claim.</p>
Warrants	Language & Computation
<p>This student states that $\frac{2}{2}$ is equal to 1 and states that multiplying by one creates an equivalent value.</p> <p>Note: While the principle is not named, this student clearly understands Multiplicative Identity.</p>	<p>There is an instance of incorrect use of mathematical language: "times" is used for multiply.</p> <p>The student's revisions show the student started to say you multiply by 2, but then realized it must be said that $\frac{2}{2}$ is 1. The warrant is clear and concise.</p>

Student B

EQUIVALENCY ARGUMENT

Find a fraction equivalent to $\frac{3}{8}$. Use diagrams, equations, and mathematical principles to prove that the fractions are equivalent.

Make sure your argument includes a claim, evidence, warrants, reasoning and conclusion.

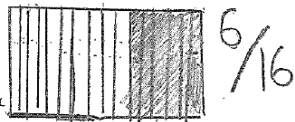
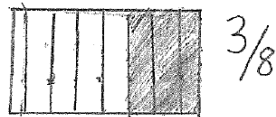
I believe that there is a fraction equivalent to $\frac{3}{8}$.

One possible equivalent fraction is $\frac{6}{16}$. This is proven by the equation and diagram below.

Equation

$$\frac{3}{8} \cdot \frac{2}{2} = \frac{6}{16}$$

Diagram



So as you can see, $\frac{3}{8}$ can easily be change to an equivalent fraction.

This works because $\frac{2}{2}$ is equal to 1 or the giant 1. Also you are multiplying the numerator and denominator by the same thing.

Commentary

This student's argument was categorized as **Adequate Quality**.

Because this task was familiar for 6th graders, most students, including this one, were able to find a correct claim and provide evidence.

This student states that $\frac{2}{2}$ is equal to 1 but doesn't explain the importance of multiplying by one to find an equivalent fraction. This student also included an accurate diagram as further evidence, but didn't explicitly connect the diagram to the claim with a warrant (the shaded areas are equal).

In general, Adequate Quality arguments tended to have implied or incomplete warrants.

Argumentation Components

Claim	Evidence
"One possible equivalent fraction is $\frac{6}{16}$."	This student provides an equation and a diagram to support the claim. The diagram is accurate and clear. The equation is correct.
Warrants	Language & Computation
This student has incomplete warrants. This student states that $\frac{2}{2}$ is equal to 1 but doesn't explain the importance of multiplying by one to find an equivalent fraction.	This is well written, but the chain of reasoning is missing the warrants. The reader must imply the warrant from the diagrams.

Student C

EQUIVALENCY ARGUMENT

Find a fraction equivalent to $\frac{3}{8}$. Use diagrams, equations, and mathematical principles to prove that the fractions are equivalent.

Make sure your argument includes a claim, evidence, warrants, reasoning and conclusion.

claim - $\frac{6}{16}$ it is just doubled

evidence - $3 \times 2 = 6$
 $8 \times 2 = 16$ not a hole they are both not holes

warrants - $3 \times 2 = 6$
 $8 \times 2 = 16$

conclusion / reasoning - The numbers are just doubled and are not hole.

Commentary

This student's argument was categorized as **Low Quality**.

Because this task was familiar for 6th graders, most students, including this one, were able to find a correct claim and provide evidence.

This student incorrectly stated that the fraction was doubled. The student doesn't explicitly demonstrate understanding of how multiplying by a form of 1 generates an equivalent fraction, even though the evidence implies understanding, or at least the ability to use the algorithm.

In general, Low Quality arguments tended to have faulty warrants.

Argumentation Components

Claim	Evidence
A claim of "6/16" is correct, but could be stated more completely.	Evidence shows use of multiplicative identity, although it is imprecisely expressed under "Evidence" and more accurately expressed under "Warrants".
Warrants	Language & Computation
The warrant is faulty. The student states that "6/16 it is just doubled." There is no mention of multiplying by 1 to find equivalent fractions. The student tries to use another warrant, that both fractions are still less than 1 whole, but it is not appropriate here.	There is an instance of incorrect spelling: "hole" is used for whole. The calculations are correct and the student restates the warrants, which is a good strategy for writing a clear argument.

Key Connecting Sorting Packet to Argumentation Resource Packet

Student number (Sorting Packet)	Resource Packet Sample
1	A
2	B
3	C
4	
5	
6	
7	
8	
9	

Student number (Sorting Packet)	Resource Packet Sample (category)
1	A (high)
2	B (adequate)
3	C (low)
	D ()
	E ()
	F ()
	G ()
	H ()
	I ()