






REPRESENTING FRACTIONS I SAMPLE STUDENT RESPONSES


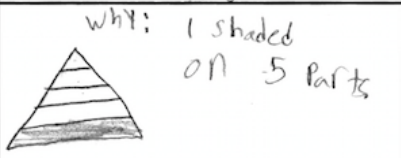


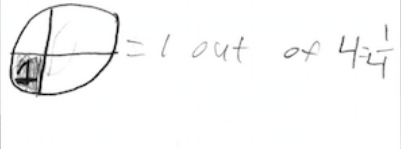
The *Representing Fractions 1* diagnostic assessment focuses on one particular misconception students have regarding the pictorial representation of fractions. Sample student responses indicative of this misconception are provided separately below, along with samples of correct student responses. To determine the degree of understanding and misunderstanding, it's important to consider both the student's answer to the selected response and the student's explanation text and representations.

Misconception 1: Seeing Fractions As Part-to-Whole with Unequal Parts

Students with this misconception consistently associate the number of pieces shaded with the numerator, and the total number of pieces for the entire figure with the denominator, but do not pay attention to the size of the pieces (or region).

The following student responses show examples of this misconception.


Item	Sample Student Responses with Evidence of Misconception 1	Notes
Pre-Assmt #1	<div style="border: 1px solid black; padding: 5px;"> <p>Is the shaded part $\frac{1}{4}$?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>Explain your choice using words and/or pictures.</p> <p>1 space is shaded and 3 aren't and 3 + 1 = 4.</p> </div> <p style="text-align: center;">"1 space is shaded and 3 aren't [aren't] and 3 + 1 = 4."</p>	<ul style="list-style-type: none"> Misconception selected response is chosen AND Explanation includes reference to shaded and total pieces AND Student ignores size of pieces
Pre-Assmt #2	<div style="border: 1px solid black; padding: 5px;"> <p>Is the shaded part $\frac{3}{5}$?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>Explain your choice using words and/or pictures.</p>   </div>	<ul style="list-style-type: none"> Misconception selected response is chosen AND Student redraws shape and writes numeric representation AND Student ignores size of pieces
Pre-Assmt #2	<div style="border: 1px solid black; padding: 5px;"> <p>Is the shaded part $\frac{3}{5}$?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p>Explain your choice using words and/or pictures.</p> <p>I chose this answer because 3 of 5 parts is shaded.</p> </div> <p style="text-align: center;">"I chose this answer because 3 of 5 parts is shaded."</p>	<ul style="list-style-type: none"> Misconception selected response is chosen AND Explanation includes reference to shaded and total pieces AND Student ignores size of pieces






<p>Post-Assmt #4</p>	<p>8. Is the shaded part $\frac{1}{5}$?</p> <p><input type="radio"/> Yes <input type="radio"/> No</p>   <p>“Why: 1 shaded on 5 parts.”</p>	<ul style="list-style-type: none"> Misconception selected response is chosen <p>AND</p> <ul style="list-style-type: none"> Explanation includes reference to shaded and total parts <p>AND</p> <ul style="list-style-type: none"> Student ignores size of pieces
<p>Post-Assmt #4</p>	<p>8. Is the shaded part $\frac{1}{5}$?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>  <p>“Because it does not matter how big it is.”</p>	<ul style="list-style-type: none"> Misconception selected response is chosen <p>AND</p> <ul style="list-style-type: none"> Student explicitly says, “It does not matter how big it is” (we can infer that “it” means the shaded part)
<p>Post-Assmt #1</p>	<p>5. Is the shaded part $\frac{1}{4}$?</p> <p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>   <p>“1 out of 4 = 1/4”</p>	<ul style="list-style-type: none"> Misconception selected response is chosen <p>AND</p> <ul style="list-style-type: none"> Explanation includes reference to shaded and total pieces <p>AND</p> <ul style="list-style-type: none"> Student ignores size of pieces

Correct Reasoning

Students with correct reasoning about representing fractions do both of the following:

- Recognize the need for equal-size parts
- Understand that the numerator and denominator indicate the number of shaded parts and the total number of parts, respectively

Item	Sample Student Responses with Correct Reasoning	Notes
<p>Pre-Assmt #1</p>	<p>Is the shaded part $\frac{1}{4}$?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>  <p>Explain your choice using words and/or pictures. I said no because the shapes are not even.</p> <p>“I said no because the shapes are not even.”</p>	<ul style="list-style-type: none"> Correct selected response is chosen <p>AND</p> <ul style="list-style-type: none"> Explanation includes information about the shape’s unequal division

<p>Pre- Assmt #1</p>	<p>Is the shaded part $\frac{1}{4}$?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>  <p>Explain your choice using words and/or pictures.</p> <p>It is not equal in each shape</p>	<ul style="list-style-type: none"> • Correct selected response is chosen <p>AND</p> <ul style="list-style-type: none"> • Explanation includes information about the shape's unequal division
<p>Pre- Assmt #2</p>	<p>Is the shaded part $\frac{3}{5}$?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>  <p>Explain your choice using words and/or pictures.</p> <p>it is $2\frac{1}{2}$ 4</p>	<ul style="list-style-type: none"> • Correct selected response is chosen <p>AND</p> <ul style="list-style-type: none"> • Explanation includes a numeric representation of the amount shaded
<p>Post- Assmt #1</p>	<p>5. Is the shaded part $\frac{1}{4}$?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>  <p>Explain your choice using words and/or pictures.</p> <p>flaw: Not even $\frac{1}{4}$ nice $\times \frac{1}{4}$</p>	<ul style="list-style-type: none"> • Correct selected response is chosen <p>AND</p> <ul style="list-style-type: none"> • Student mentions that the parts are "not even" and draws a correct representation of $\frac{1}{4}$
<p>Post- Assmt #3</p>	<p>7. Is the shaded part $\frac{2}{5}$?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>  <p>Explain your choice using words and/or pictures.</p> <p>One of the sections are Not filled in all the way 4cy</p>	<ul style="list-style-type: none"> • Correct selected response is chosen <p>AND</p> <ul style="list-style-type: none"> • Explanation mentions sections of unequal size
<p>Post- Assmt #4</p>	<p>8. Is the shaded part $\frac{1}{5}$?</p> <p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>  <p>Explain your choice using words and/or pictures.</p> <p>No sense it is an triangle it only has one way of having even sides right down the middle</p>	<ul style="list-style-type: none"> • Correct selected response is chosen <p>AND</p> <ul style="list-style-type: none"> • Explanation describes an alternative division that <i>would</i> have equal parts