THIRD SPACE LEARNING

Error Analysis

Fractions

3rd Grade

Instructions

A student has been given a set of questions to answer. They tried their best but think they have got some answers wrong.
Go through the work and check the answers. Help the student understand their errors by explaining what they did wrong or how to find the correct answer (there are prompts below the questions to help you).
Note that you will not always be asked to provide the correct answer.

1 $\frac{3}{15} + \frac{3}{15} + \frac{3}{15} =$



This answer is: ☐ Correct ☐ Incorrect

$\frac{9}{15}$

Explain how to add fractions with the same denominator.

2 Compare the fractions using <, > or =.

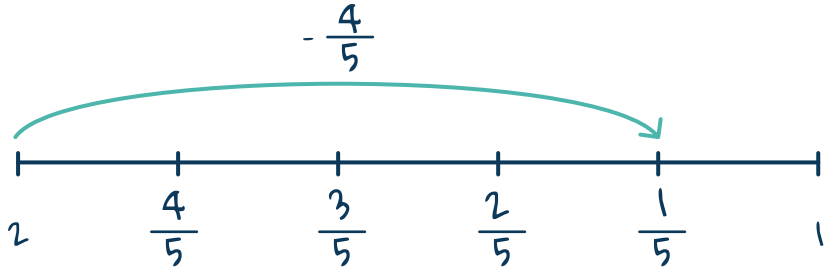
$\frac{2}{3}$ < $\frac{2}{5}$

This answer is: ☐ Correct ☐ Incorrect

If incorrect, what should the answer be? Explain.

© Third Space Learning 2024. You may photocopy this page.

3 $2 - \frac{4}{5} =$

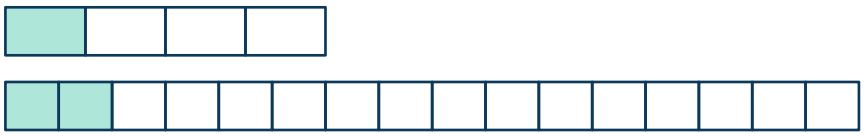


This answer is: ☐ Correct ☐ Incorrect

$\frac{1}{5}$

If incorrect, explain the error.

4 $\frac{1}{4} = \frac{?}{16}$

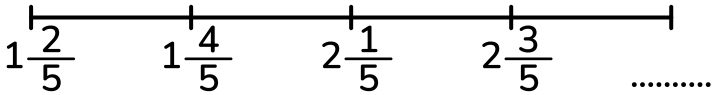


This answer is: ☐ Correct ☐ Incorrect

$\frac{2}{16}$

If incorrect, explain why the representations are misleading.

5 Which number is missing on the number line?



This answer is: ☐ Correct ☐ Incorrect

$2\frac{5}{5}$

If incorrect, what should the answer be? Explain.

© Third Space Learning 2024. You may photocopy this page.

6 What fraction of the bar model is shaded?

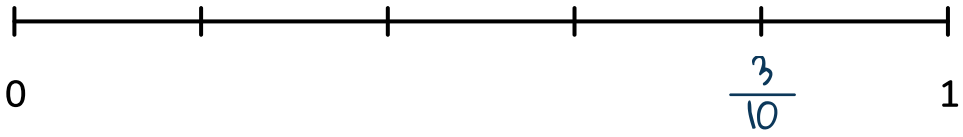


$\frac{4}{3}$

This answer is: ☐ Correct ☐ Incorrect

Explain what the numerator and denominator are.

7 Place $\frac{3}{10}$ on the number line.



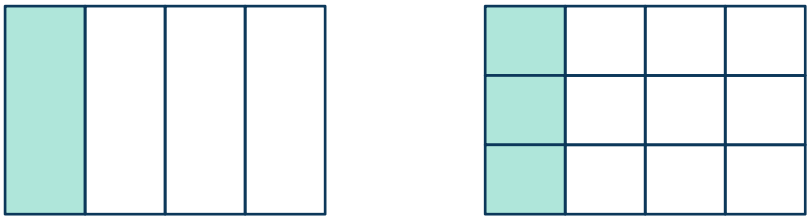
This answer is: ☐ Correct ☐ Incorrect

If incorrect, what should the answer be? Explain.

© Third Space Learning 2024. You may photocopy this page.

8 $\frac{1}{4} = \frac{?}{12}$

Use the diagram to help you.



$\frac{3}{12}$

This answer is: ☐ Correct ☐ Incorrect

Explain what an equivalent fraction is.

9 Complete the fractions so they equal one whole.

$\frac{8}{9}$ $\frac{7}{8}$ $\frac{11}{12}$ $\frac{15}{20}$

This answer is: ☐ Correct ☐ Incorrect

Explain how you know when a fraction is equal to one whole.

© Third Space Learning 2024. You may photocopy this page.

10 Compare each fraction using <, > or =.

$\frac{1}{7}$ [>] $\frac{1}{2}$

$\frac{1}{4}$ [<] $\frac{2}{8}$

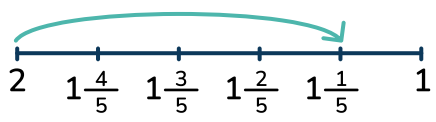
$\frac{1}{10}$ [>] $\frac{1}{5}$

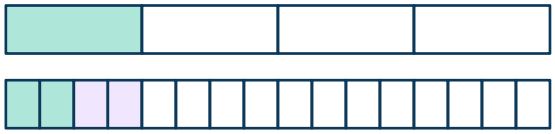
This answer is: ☐ Correct ☐ Incorrect

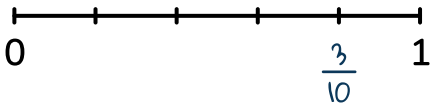
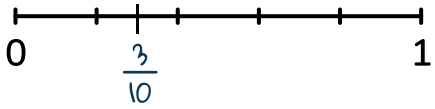
If incorrect, what should the answers be? Explain.

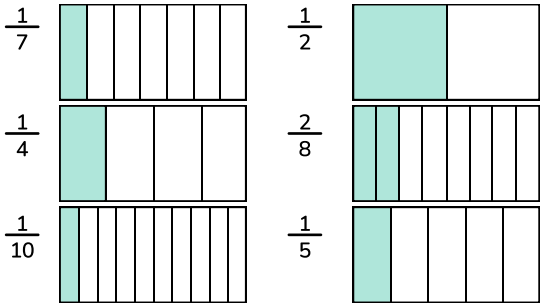
© Third Space Learning 2024. You may photocopy this page.

Answers

Question Number	Question	Answer
1	$\frac{3}{15} + \frac{3}{15} + \frac{3}{15} =$ $\frac{9}{15}$ Explain how to add fractions with the same denominator.	Correct To add fractions with the same denominator, add the numerators together. The denominator stays the same as this represents the total number of equal shares. Students will sometimes form misconceptions when adding and subtracting fractions. One misconception is that the denominator should change when adding fractions. Using concrete and pictorial representations help to avoid this misconception developing.
2	Compare the fractions using <, > or =. $\frac{2}{3} < \frac{2}{5}$ If incorrect, what should the answer be? Explain.	Incorrect The student possibly thought that the fraction with the lower number denominator is the smaller fraction. Correct answer: $\frac{2}{3} > \frac{2}{5}$ When the whole is divided into fewer parts (3 instead of 5), each part is larger. So, 2 parts out of 3 are larger than 2 parts out of 5.
3	$2 - \frac{4}{5} =$ $\frac{1}{5}$ If incorrect, explain the error.	Incorrect A number line has been used to solve the calculation, however the whole numbers have been missed from the number line. Correct answer: $1\frac{1}{5}$ 

Question Number	Question	Answer
4	$\frac{1}{4} = \frac{?}{16}$ $\frac{2}{16}$ If incorrect, explain why the representation is misleading.	Incorrect The diagram is misleading because the two rows of boxes should be the same width.  Correct answer: $\frac{4}{16}$ The answer shows a lack of understanding of how to find equivalent fractions. The answer has not given consideration to the relationship between the two given denominators. Students can use bar models to find equivalent fractions.
5	Which number is missing on the number line? $2\ \frac{5}{5}$ If incorrect, what should the answer be? Explain.	Incorrect The answer shows a misunderstanding of when a fraction with the same numerator and denominator is equal to 1 and so the whole number increases by 1. Correct answer: 3 $2\ \frac{5}{5} = 2 + \frac{5}{5} = 2 + 1 = 3$
6	What fraction of the bar model is shaded? Given answer: $\frac{4}{3}$ Explain what the numerator and denominator are.	Incorrect The denominator is the number below the fraction line and describes the number of equal parts the whole is divided into. The numerator is the number above the fraction and describes the number of those equal parts. Correct answer: $\frac{4}{7}$ Students need to understand that the denominator represents the total parts the whole has been divided into.

Question Number	Question	Answer
7	Place $\frac{3}{10}$ on the number line. Given answer:  If incorrect, what should the answer be? Explain.	Incorrect The scale of the number line has not been considered. Instead of counting each division as $\frac{2}{10}$, they have been counted as $\frac{1}{10}$ Correct answer:  Students could identify that $\frac{3}{10}$ is less than a half and should not be as close to 1 as it has been placed.
8	$\frac{1}{4} = \frac{?}{12}$ Given answer: $\frac{3}{12}$ Explain what an equivalent fraction is.	Correct Two fractions are equivalent when they are the same proportion of a quantity. The student has used the diagram appropriately and therefore found the correct answer. Using the diagram shows the student that $\frac{1}{4}$ and $\frac{3}{12}$ are the same proportion of the diagram so they are equivalent.
9	Complete the fractions so they equal one whole. Explain how you know when a fraction is equal to one whole.	Incorrect A fraction is equal to 1 when the numerator and the denominator of the fraction are the same number. Correct answers: $\frac{9}{9}$ $\frac{7}{7}$ $\frac{12}{12}$ $\frac{15}{15}$ The answers do not show an understanding of the fact that when the numerator and denominator are equal the fraction equals one whole.

Question Number	Question	Answer
10	Compare each fraction using <, > or =. Given answer: >, <, > If incorrect, what should the answers be? Explain.	Incorrect  Correct answers: $\frac{1}{7} < \frac{1}{2}$ $\frac{1}{4} = \frac{2}{8}$ $\frac{1}{10} < \frac{1}{5}$ The fractions have been incorrectly compared. The fractions have been compared as if the larger the denominator, the larger the number.

Do you have a group of students who need a boost in math?

Each student could receive personalized lessons every week from our specialist one-on-one math tutors.

- Differentiated instruction for each student
- Aligned to your state's standards
- Scaffolded learning to close gaps

“We just had our first session and it went great! The kids really liked it and felt like they were learning! One even said he finally felt like math was making sense.”

Michelle Craig, Instructional Coach,
Sherwood Forest Elementary, Washington

Speak to us

thirdspacelearning.com/us/

+1 929-298-4593

hello@thirdspacelearning.com

THIRD SPACE LEARNING