

Task Model 1	Prompt Features: The student is prompted to select the fraction represented by the model or the model represented by the fraction.				
Response Type: Multiple Choice, single correct response DOK Level 1 3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b	Stimulus Guidelines:• Denominators are limited to 2, 3, 4, 6 and 8.• Area models are polygons or circles.• Follow any stated guidelines on allowable number ranges.• Item difficulty can be adjusted via these example methods:• Unit fraction model partitioned into equal sized parts corresponding to the denominator; one part is shaded representing the unit fraction.• $\frac{a}{b}$ fraction models partitioned into equal parts representing the denominator; parts are shaded to				
equal parts; understand a fraction <i>a/b</i> as the quantity formed by <i>a</i> parts of size 1/ <i>b</i> .	represent an $\frac{a}{b}$ fraction. • Models with the shaded areas switched should not be included as distractors (e.g., $\frac{7}{8}$ are shaded instead of $\frac{1}{8}$).				
Evidence Required: 1. The student represents a fraction 1/b as 1 part of a whole that is	TM1 Stimulus: The student is presented with a fraction in the form of $\frac{a}{b}$.				
partitioned into <i>b</i> equal parts, and a fraction <i>a/b</i> as the quantity formed by <i>a</i> parts of size 1/ <i>b</i> using a model. For this evidence statement, <i>a/b</i> may	Example Stem 1: Which model shows $\frac{1}{8}$ of the whole figure shaded? A. C. C.				
than, or equal to 1.	B. D. D.				

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Version 3.0



TM1 (continued)



Task Model 1

Response Type: Multiple Choice, single correct response

DOK Level 1

3.NF.A.1

Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction *a/b* as the quantity formed by a parts of size 1/b.

Evidence Required:

1. The student represents a fraction 1/b as 1 part of a whole that is partitioned into b equal parts, and a fraction a/b as the quantity formed by a parts of size 1/b using a model. For this evidence statement, *a/b* may be greater than, less than, or equal to 1.

Tools: None







Example Stem 3: Which model shows $\frac{2}{6}$ of the whole figure shaded?







Example Stem 4: Which model shows $\frac{2}{6}$ of the whole figure shaded?







Rubric: (1 point) The student selects the correct model (e.g., A; C; C; B).

Response Type: Multiple Choice, single correct response



 Task Model 2a Response Type: Equation/Numeric DoK Level 2 3.NF.A.2 Understand a fraction as a number on the number line; rumber line; number line; line;						
 Response Type: Equation/Numeric DoK Level 2 3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/b on a number line diagram. b. Represent a fraction 1/b on a number line diagram. b. Represent a fraction 1/b on a number line diagram. b. Represent a fraction 1/b on a number line diagram. c. Identify a fraction represented by a labeled point on a number line; number line is from 0-1 and divided into increments. c. Identify a fraction represented by a labeled point on a number line diagram. d. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. b. Represent a fraction 4/b on the number line. b. Represent a fraction 4/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number line. Evidence Required: 2. The student interval fractions on a number line. Evidence Required: 2. The student interval fractions on a number line. Evidence Required: 2. The student interval fractions on a number line. Evidence Required: 2. The student interval fractions For a sta whole, with or without partitioning. Tools: None 		Task Model 2a	Prompt Features: The student is prompted to identify the			
 Response Type: Equation/Numeric Stimulus Guidelines: Dok Level 2 SNF.A.2 Understand a fraction as number on the number line; rumber line; rumber line; rumber line; rumber line; number line; line; line;			numerical fraction represented by a given point on a number line.			
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 Follow any stated guidelines on allowable number ranges. Item difficulty can be adjusted via these example methods: Identify a fraction represented by a labeled point on a number line; n			 Denominators are limited to 2, 3, 4, 6 and 8. 			
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represents fractions on a number line using the interval 0–1 as the whole, with or without partitioning.	ļ	2. The student				
on a number line using the interval 0–1 as the whole, with or without partitioning.	ļ	identifies and				
using the interval 0–1 as the whole, with or without partitioning.	ļ	represents fractions				
as the whole, with or without partitioning. Tools: None	ļ	using the interval 0 1				
without partitioning. Tools: None	ļ	as the whole with or				
Tools: None	ļ	without nartitioning				
Tools: None	ļ	menoue parentioning.				
		Tools: None				



Task Model 2b	Prompt Features: The student is prompted to use the Add Point tool to place a given fraction on a number line.				
Response Type: Graphing	Stimulus Guidelines:				
DOK Level 2	 Denominators are limited to 2, 3, 4, 6 and 8. Follow any stated guidelines on allowable number ranges. Item difficulty can be adjusted via these example methods: 				
3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.	 Identify the location of a fraction on a number line; number line is from 0-1 and is either divided into increments or not divided into increments. Identify a fraction on a number line; number line begins at 0 and extends to a whole number past 1 and is divided into increments. 				
fraction 1/b on a number line diagram	TM2b Stimulus: The student is presented with a fractional number line.				
interval from 0 to 1 as the whole and partitioning it into b	Example Stem: Use the Add Point tool to place a point on the number line where $\frac{2}{4}$ should be located.				
Recognize that each part has size 1/b and that the endpoint of the part based at 0					
locates the number 1/b on the number line. b . Represent a	Rubric: (1 point) The student places a point at the correct location on the number line (e.g., $\frac{2}{4}$ is placed halfway between 0 and 1).				
fraction <i>a/b</i> on a number line diagram	Response Type: Graphing				
by marking off <i>a</i> lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	Accessibility Note: Graphing items are not currently able to be Brailled. Minimize the number of items developed to this TM.				
Evidence Required: 2. The student identifies and represents fractions on a number line					
using the interval 0–1 as the whole, with or without partitioning.					



Task Model 2c	Prompt Features: The student is prompted to drag one or more fractions to the correct location on a number line.				
Response Type:					
Drag and Drop	Stimulus Guidelines:				
	 The student is prompted to drag one or more fractions to 				
DOK Level 2	correct location on a number line.				
	• Denominators are limited to 2, 3, 4, 6 and 8.				
3.NF.A.2	Follow any stated guidelines on allowable number ranges.				
Understand a	• Item difficulty can be adjusted via these example methods:				
rraction as a number	 Drag a fraction to its correct location on a number line; number line is from 0, 1 and not divided into 				
represent fractions	increments				
on a number line	 Identify a fraction represented by a labeled point on a 				
diagram.	number line: number line begins at 0 and extends to a				
a. Represent a	whole number past 1 and is divided into increments.				
fraction 1/b on a					
number line diagram					
by defining the	TM2c				
interval from 0 to 1	Stimulus: The student is presented with a number line and two or				
as the whole and	more fractions in the form $\frac{a}{b}$.				
partitioning it into b					
equal parts.	Example Stem 1: Drag each fraction to the number line, as close				
nart has size 1/h and	to the exact location as possible.				
that the endpoint of					
the part based at 0					
locates the number	0 1				
1/b on the number	2 1				
line.	$\frac{3}{9}$ $\frac{1}{9}$				
b. Represent a	δδ				
fraction <i>a/b</i> on a	Rubric: (2 points) The student places both fractions at the correct				
hy marking off a	location on the number line (e.g., $\frac{1}{2}$ and $\frac{3}{2}$ are placed at their				
lengths $1/b$ from 0	approximate location) Λ tolerance of + half of the unit fraction is				
Recognize that the	acceptable for scoring (e.g. $\pm \frac{1}{2}$ because $\frac{1}{2}$ is the unit)				
resulting interval has	acceptable for scoring (e.g., $\pm \frac{1}{16}$ because $\frac{1}{8}$ is the unit).				
size a/b and that its	(1 point) The student places one fraction within the interval of talerance for its correct location AND places the other fraction on the				
endpoint locates the	correct side (less than or greater than) of the correctly placed				
number <i>a/b</i> on the	fraction. The same tolerance level as the 2-point rubric is allowed for				
number line.	determining the correct location.				
Evidence Deguived.					
2 The student					
identifies and	Response Type: Drag and Drop				
represents fractions					
on a number line	Accessibility Note:				
using the interval 0-	brag and drop items are not currently able to be brailied. Minimize				
1 as the whole, with					
or without					
partitioning.					
Toola, None					
TOOIS: NOTE					
	I MZC (CONTINUED)				



Example Stem 2: Place each fraction on the number line, as close to its exact location as possible.

Task Model 2c

Response Type: Drag and Drop

DOK Level 2

3.NF.A.2

Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.

b. Represent a fraction *a/b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.

Evidence Required:

2. The student identifies and represents fractions on a number line using the interval 0– 1 as the whole, with or without partitioning.



Rubric: (2 points) The student places all fractions at the correct location on the number line (e.g., $\frac{2}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{4}{1}$ are placed at their approximate location). A tolerance of \pm half of the unit fraction is acceptable for scoring (e.g., $\pm \frac{1}{8}$ for fourths).

(1 point) The student places three out of four fractions at the correct location, within the interval of tolerance, AND places the other fraction on the correct side (less than or greater than) of the correctly placed fractions.

Response Type: Drag and Drop

Source: Illustrative Mathematics

(3.NF.A.2a) <u>http://www.illustrativemathematics.org/illustrations/173</u>

Accessibility Note:

Drag and drop items are not currently able to be Brailled. Minimize the number of items developed to this TM.

Grade 3 Mathematics Item Specification C1 TF



Tools: None		



Task Model 3a	Prompt Features: The student is prompted to write or identify an		
	equivalent fraction for the given model.		
Response Type: Equation/Numeric	Stimulus Guidelines:		
DOK Level 1	 Follow any stated guidelines on allowable number ranges. Fractions are represented by area models, fraction strips, or number lines. 		
 3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b 	 number lines. Denominators are limited to 2, 3, 4, 6 and 8. Follow any stated guidelines on allowable number ranges. Item difficulty can be adjusted via these example methods: Two fraction models that are polygons or circles where denominators are multiples of each other. One fraction model has part(s) shaded. Fraction strips with a shaded fraction on the top row. Two number lines where denominators are multiples of each other. One number line has a labeled point at a location. 		
partitioning it into <i>b</i> equal parts. Recognize that each	Stimulus: The student is presented with a visual fraction model with a fraction shaded.		
part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line. b. Represent a fraction <i>a/b</i> on a	Example Stem: Use the fraction strip model shown to help you with this problem.		
number line diagram by marking off <i>a</i> lengths 1/ <i>b</i> from 0.	Enter a fraction equal to $\frac{2}{4}$ that has a different denominator.		
Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	Rubric: (1 point) The student enters an equivalent fraction (e.g., $\frac{1}{2}$ or $\frac{4}{8}$). Response Type: Equation/Numeric		
Evidence Required: 3. The student identifies two fractions as equal if they are the same size or at the same point on a number line. Tools: None			



Task Model 3b

Response Type: Multiple Choice, multiple correct responses

DOK Level 1

3.NF.A.2

Understand a fraction as a number on the number line; represent fractions on a number line diagram. **a.** Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.

b. Represent a fraction *a/b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Recognize that the resulting interval has size *a/b* and that its endpoint locates the number *a/b* on the number line.

Evidence Required:

3. The student identifies two fractions as equal if they are the same size or at the same point on a number line.

Tools: None

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Stimulus: The student is presented with a fractional number line with a point labeled on the number line.

Example Stem: Use this number line to answer the question that follows.



Choose **all** the number lines that show a fraction equal to the fraction shown by point *P*.



Rubric: (1 point) The student selects all number lines that show $\frac{1}{2}$ (e.g., A, B).

Response Type: Multiple Choice, multiple correct responses



Task Model 4	Prompt Features: The student is prompted to generate an				
Pesponse Type:	equivalent fraction based on a whole divided into sections.				
Hot Spot	Stimulus Guidelines:				
	Follow any stated guidelines on allowable number ranges.				
DOK Level 2	 Fraction model is a polygon or circle. 				
 3.NF.A.3b Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model. 	 Fraction model is a polygon or circle. Denominators are limited to 2, 3, 4, 6 and 8. Item difficulty can be adjusted via these example methods: Fraction models are divided into 4, 6, or 8 equal parts and students generate a fraction model equivalent to 1/2. Fraction models are divided into 6 or 8 equal parts and students generate a fraction model equivalent to 1/3 or 1/4. Fraction models are divided into 6 or 8 equal parts and students generate a fraction model equivalent to 3/3 or 2/4. Fraction models are divided into 6 or 8 equal parts and students generate a fraction model equivalent to 3/4 or 2/3. Fraction models are divided into 2, 3, or 4 equal parts and students generate a fraction model equivalent to 2/4 / 6/3 / 6/3 / 8/3 / 0r 6/8. 				
Evidence Required:	Stimulus: The student is presented with a blank visual fraction model to generate an equivalent fraction.				
generates simple equivalent fractions using visual fraction models.	Example Stem: Use this model to solve the problem.				
Tools: None					
Accessibility Note: Hot spot items are not currently able to be Brailled. Minimize the number of items developed to this TM.	Click parts of the model to shade $\frac{2}{4}$ of the whole model. Rubric: (1 point) Student creates a fraction model equal to the given fraction (e.g., $\frac{4}{8}$).				
	Kesponse Type: Hot Spot				



Task Model 5	Prompt Features: The student is prompted to enter either the				
Pesponse Type	numerator or denominator needed to complete a fraction equal to a				
Foundation / Numeric					
	Stimulus Guidelines:				
DOK Level 1	Follow any stated guidelines on allowable number ranges.				
	• Denominators are 1, 2, 3, 4, 6, and 8.				
3.NF.A.3c	• Denominator is equal to 1 when fraction is equal to a whole				
Explain equivalence	number that is greater than 1.				
of fractions in special	• Item difficulty can be adjusted via these example methods:				
cases, and compare	 Represent a fraction as a whole number using fraction 				
reactions by	models such as number lines and rectangular figures. 0 - 1 number line with fraction increments either				
	 0-1 number line with fraction increments either labeled or not labeled 				
c. Express whole	 Unknown numerator or denominator represented with 				
numbers as fractions,	a box that completes a fraction equal to a whole				
and recognize					
fractions that are	TM5a				
equivalent to whole	Stimulus: The student is presented with a visual fraction model				
numbers. <i>Examples:</i>	with an equation using a whole number and a fraction. Either the				
Express 3 in the form $2 - 2/1$, recognize	numerator or the denominator is unknown and represented with a				
3 = 3/1; recognize that $6/1 = 6$; locate	DOX.				
4/4 and 1 at the	Example Stem 1: Use the number line to help you complete the				
same point of a	equation.				
number line diagram.					
	∢ ┼ ─ ┼ ─ ┼ ─ ┼ → 				
Evidence Required:	$0 \frac{1}{2} \frac{2}{3} \frac{3}{1}$				
5. The student	4 4 4				
numbers as fractions					
and recognizes					
fractions equal to	$1 = \frac{1}{2}$				
whole numbers.	4				
	What numerator goes in the box (\square) to make the equation true?				
Tools: None					
	Example Stem 2: Use the number line to help you complete the				
	equation.				
	<+++++				
	0 1				
	$1 = \frac{1}{4}$				
	What numerator goes in the box (\Box) to make the equation true?				
	Rubric: (1 point) The student enters the correct value (e.g., 4; 4). Response Type: Equation/Numeric				

- ion is equal to a whole
- ese example methods:
 - e number using fraction and rectangular figures.
 - increments either
 - inator represented with n equal to a whole.

TM5a (continued)



Task Model 5

Response Type: Equation/Numeric

DOK Level 1

3.NF.A.3c

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. **c.** Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples:* Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.

Evidence Required:

5. The student expresses whole numbers as fractions and recognizes fractions equal to whole numbers.

Tools: None



What numerator goes in the box (\Box) to make the equation true?

 $\frac{\Box}{R} = 1$

TM5b

Stimulus: The student is presented with an equation using a whole number and a fraction. Either the numerator or the denominator is unknown and represented with a box.

Example Stem 1: What denominator goes in the box () to make the equation true?



Example Stem 2:

What numerator goes in the box (\Box) to make the equation true?

 $\frac{1}{1} = 2$

TM5c

Stimulus: The student is presented with an equation where 1 is written as a fraction and numeral. Either the numerator or the denominator of the fraction for 1 is represented with a box.

Example Stem 1:

What numerator goes in the box (\Box) to make the equation true?

$$\frac{1}{2} = 1$$

Example Stem 2:

What denominator goes in the box (\Box) to make the equation true?

$$1 = \frac{2}{\Box}$$

Rubric: (1 point) The student enters the correct value (e.g., 8; 1; 2; 2; 2).

Response Type: Equation/Numeric



Task Model 6a	Prompt Features: The student is prompted to compare fractions				
Response Type: Matching Tables	identifying the symbol needed to complete an inequality.				
Matching Tables	Stimulus Cuidelines				
DOK Level 2	 Denominators are limited to 2, 3, 4, 6, and 8. Follow any stated guidelines on allowable number ranges 				
3.NF.A.3d Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <,	 Follow any stated guidelines on allowable number ranges Item difficulty can be adjusted via these example method Select the symbol needed to compare two fraction with the same denominator. Select the symbol needed to compare two fraction with the same numerator. TM6a Stimulus: The student is presented with two pairs of fractions w the same numerators and/or same denominators and directed to compare them using (<, >, or =). Example Stem: Select the symbol (<, >, or =) that correctly compares each pain numbers.				
and justify the	< > =				
conclusions, e.g., by using a visual fraction model.	$\frac{5}{8} \Box \frac{5}{6}$				
Evidence Required: 6. The student compares two fractions with the same numerator or the same denominator using	$\frac{3}{6}$ $\frac{3}{8}$ Rubric: (1 point) The student identifies the correct symbol to compare pairs of fractions (e.g., <, >).				

- re limited to 2, 3, 4, 6, and 8.
- d guidelines on allowable number ranges.
 - an be adjusted via these example methods: e symbol needed to compare two fractions same denominator.
 - e symbol needed to compare two fractions same numerator.

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$\frac{5}{8} \Box \frac{5}{6}$			
$\frac{3}{6} \Box \frac{3}{8}$			

Response Type: Matching Tables

Tools: None

>.

Version 3 Update:

the symbols <, =, or

Changed TM5 from an equation/numeric response type to a matching table response type. Updated the stimulus and stem to match the new format.



Task Model 6b	Prompt Features: The student is prompted to compare fractions with either the same numerator or the same denominator by					
Response Type: Multiple Choice	identifying the unknown numerator or denominator.					
single correct	Stimulus Guidelines:					
response	• Denominators are limited to 2, 3, 4, 6, and 8.					
DOK Level 2	 Follow any stated guidelines on allowable number ranges. Item difficulty can be adjusted via these example methods: Identify the unknown numerator or denominator. 					
3.NF.A.3d	needed to complete a comparison of two fractions					
Compare two	with the same denominator.					
fractions with the	 Identify the unknown numerator or denominator needed to complete a comparison of two fractions 					
the same	with the same numerator.					
denominator by						
reasoning about their						
size. Recognize that	IM6D Stimulus: The student is presented with an incomplete comparison					
only when the two	of two fractions using the symbols $<$ or $>$ where either the					
fractions refer to the	numerator or denominator is the unknown.					
same whole. Record	Channel Wilhigh assume her soos in the base to make the communican two 2					
comparisons with the	Stem: which number goes in the box to make the comparison true?					
symbols >, =, or <,	5 🔲					
and justify the $\frac{1}{8} > \frac{1}{8}$						
conclusions, e.g., by						
model.	A. 3					
Evidence Required:	D. 9					
6. The student						
fractions with the	Rubric: (1 point) The student selects the correct number (e.g., A).					
same numerator or the same	Response Type: Multiple Choice, single correct response					
<pre>denominator using the symbols <, =, or >.</pre>						
Tools: None						



Task Model 6c	Prompt Features: The student is prompted to compare fractions				
	with either the same numerator or the same denominator by				
Response Type:	selecting true or false to show whether an inequality is true.				
Matching Tables					
	Stimulus Guidelines:				
DOK Level 2	• Denominators are limited to 2, 3, 4, 6, and 8. Fractions may use any denominator that is a multiple of 2, 3, and/or 5 and				
3.NF.A.3d	less than or equal to 100				
Compare two	Follow any stated guidelines on allowable number ranges				
fractions with the	 Follow any stated guidelines on anowable number fanges. Them difficulty can be adjusted via these events as the day. 				
	Item unificulty can be adjusted via these example methods: Called these and false to allow whether				
same numerator or	 Select true or false to show whether a comparison of 				
the same	two frac	tions with the same	denominator is true.		
denominator by	 Select true or false to show whether a comparison of 				
reasoning about their	two frac	ctions with the same	e numerator is true.		
size. Recognize that					
comparisons are valid	TM6c				
only when the two	Stimulus: The studer	nt is presented with	two or three comparisons		
fractions refer to the	of two fractions using	the symbols $<$, $>$, c)r =.		
same whole Record	e. e. e a este a eg				
the results of	Stem: Decide whethe	r each comparison i	s true or false Click True		
comparisons with the	or Falso for each com	naricon			
comparisons with the symbols $> -$ or $<$	of raise for each com	parison.			
symbols $>, =, 01 <,$		Truce	Falsa		
		Irue	Faise		
conclusions, e.g., by					
using a visual fraction	3 1				
model.	$\frac{1}{4} < \frac{1}{4}$				
Evidence Required:					
6. The student					
compares two	$2 \leq 2$				
fractions with the	$\left -\frac{1}{4} \right ^{-1}$				
same numerator or					
the same					
donominator using					
the symbols $<, =, or$	Rubric: (1 point) The student answers correctly, identifying each				
>.	as True or False (e.g., F, T).				
_					
Tools: None	Response Type: Matching Tables				