

DRAFT - OGAP Proportionality Item Bank Table of Contents

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Rate: Concentrations

<i>New code</i>	<i>Topic</i>	<i>Rate Subtopic</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
CN1	Rates	Concentrations/mixtures	Ratio comparison	Some Non-integral	All Integers	Text only	Mary's drink had a stronger orange flavor.
CN2	Rates	Concentrations/mixtures	Ratio comparison	Some Non-integral	All Integers	Text only	Mary's drink has a stronger orange flavor.
CN3	Rates	Concentrations/mixtures	Missing Value	Both Non-integral	All Integers	Text only	The punch bowl will contain $9\frac{3}{5}$ cups of grape juice and $6\frac{2}{5}$ cups of ginger ale.
CN4	Rates	Concentrations/mixtures	Missing Value	Both Integral	All Integers	Text only	The punch will have 12 cups of grape drink and 8 cups of ginger ale.
CN5	Rates	Concentrations/mixtures	Missing Value	Both Integral	All Integers	Text only	Franklin is not right. They would need $6\frac{1}{2}$ cups of ginger ale.
CN6	Rates Concentrations Mixtures 11.pdf	Concentrations/mixtures	Missing Value	Some Non-integral	Both integers and non-integers	Text only	The recipe will need 3 gallons of orange juice and $1\frac{1}{2}$ gallons of cranberry juice.
CN7	Rates	Concentrations/mixtures	Missing Value	Both Non-integral	All Integers	Text only	In one cup of juice there will be $\frac{5}{13}$ cups of orange juice concentrate and $\frac{8}{13}$ cups of water.
CN8	Rates	Concentrations/mixtures	Missing Value	Both Non-integral	Both integers and non-integers	Text only	Max would need to add one cup of water.

Rate – Conversions

<i>New code</i>	<i>Topic</i>	<i>Rate Subtopic</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
CV1	Rates	Conversions	Missing Value	Both Non-integral	Both integers and non-integers	Text only	The suitcase would weigh 13.64 kilograms (a). The suitcase would weigh 66 pounds (b).
CV6	Rates	Conversions	Missing Value	Both Non-integral	Both integers and non-integers	Text only	Brad should get 34.86 Euro
CV7	Rates	Conversions	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Bob is correct. The CD is less expensive in Canada
CV8	Rates	Conversions	Rate Comparison	Both Non-integral	All Integers	Text only	C.
CV9	Rates	Conversions	Missing Value	Some Non-integral	Both integers and non-integers	Text only	A. The suitcase will weigh 110 pounds. B. The suitcase will weigh 22.727 kilograms.
CV10	Rates	Conversions	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Leslie's car is about 19½ feet.
CV11	Rates	Conversions	Missing Value	Both Non-integral	All Integers	Text only	Yes. She has \$3.75 left.
CV13	Rates	Conversions	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Sally would have 83 Euro.
CV2	Rates	Conversions	Missing Value	Some Non-integral	All Integers	Text only	Justin does not have enough money.
CV12	Rates	Conversions	Missing Value	Both Integral	All Integers	Text only	Fred would need more than 80 Japanese yen. He needs 92 yen.
CV3	Rates	Conversions	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Mark is correct.
CV4	Rates	Conversions	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Stephanie does not have enough money.
CV5	Rates	Conversions	Missing Value	Some Non-integral	All Integers	Text only	Erin would get 2250 pesos for 100.5 dollars

Rates – Packing and Distributing

<i>New code</i>	<i>Topic</i>	<i>Rate Subtopic</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
PD1	Rates	Packing/distribution	Missing Value	Some Non-integral	All Integers	Text only	Carrie will need 12 boxes.
PD2	Rates	Packing/distribution	Missing Value	Both Non-integral	All Integers	Text only	Carrie will need 10 1/2 boxes.
PD3	Rates	Packing/distribution	Missing Value	Some Non-integral	All Integers	Text only	Twenty feet of bookshelf is needed for 50 science books.
PD4	Rates	Packing/distribution	Missing Value	Both Integral	All Integers	Text only	Fourteen boxes are needed to hold 84 pints.
PD5	Rates	Packing/distribution	Missing Value	Both Integral	All Integers	Text only	Three DVD racks can hold 96 DVD's.
PD6	Rates	Packing/distribution	Non-proportional	None	All Integers	Text only	Maggie can pack about 15 outfits.
PD7	Rates	Packing/distribution	Missing Value	Both Non-integral	Both integers and non-integers	Text only	Maggie's suitcase can hold about 9 outfits.
PD8	Rates	Packing/distribution	Missing Value	Both Non-integral	All Integers	Text only	Five boxes will reach 6 2/3 ft or 6 ft 8 inches.
PD9	Rates	Packing/distribution	Missing Value	Some Non-integral	All Integers	Text only	11 boxes result in a stack less than 16 ft. (12 boxes are exactly 16 ft).
PD10	Rates	Packing/distribution	Missing Value	Some Non-integral	Both integers and non-integers	Text only	14 boxes result in a stack less than 17.5 feet (15 boxes of books is exactly 17.5 feet).
PD11	Rates	Packing/distribution	Missing Value	Both Non-integral	All Integers	Table	The sixth grade should have 6 students, the seventh grade should have 9 students, and the eighth grade

Probability

<i>New code</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
PB1	Missing Value	Both Non-integral	Both integers and non-integers	Text only	The fewest number of red marbles that could be added to the bag is 18 red marbles.
PB2	Missing Value	Both Non-integral	Both integers and non-integers	Text only	The fewest number of red chips added to the bag is 7 red chips.
PB3	Rate Comparison	Both Integral	All Integers	Text only	C
PR4	Rate Comparison	Both Non-integral	All Integers	Text only	Kendra is right.
PB5	Missing Value	Both Integral	All Integers	Text only	The school can expect 5 students to get the flu.
PB6	Missing Value	Some Non-integral	All Integers	Text only	The class will expect about 6 students to get a cold.
PB7	Missing Value	Some Non-integral	All Integers	Text only	There will be about 22 students in a class.
PB8	Missing Value	Some Non-integral	All Integers	Text only	There are 20 students take the bus
PB9	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Charles should add 16 non yellow chips to the bag
PB10	Rate Comparison	Both Integral	All Integers	Text only	B) 5000 H and 5000 T.
PB11	Rate Comparison	Some Non-integral	All Integers	Text only	Mary's bag has the best chance of picking a red marble.
PB12	Rate Comparison	Some Non-integral	All Integers	Text only	Mary's bag has the best chance of picking a red marble.
PB13	Rate Comparison	Both Non-integral	All Integers	Text only	B) Sue pulled a yellow marble.
PB14	Missing Value	Some Non-integral	All Integers	Graphic	Leah should expect to win 8 times in 12 spins.
PB15	Missing Value	Both Integral	All Integers	Graphic	Leah would expect to win 3 times.
PB16	Rate Comparison	Some Non-integral	All Integers	Text only	Sue's bag has the best chance of picking a red marble.

Scale

New code	Topic	Item Type	Multiplicative relationship within and across ratios	Numbers	Format of Item	Solution
SC1	Scale	Missing Value	Both Non-integral	All Integers	Text only	D (the scale is $1=6 \frac{1}{4}$ miles)
SC2	Scale	Missing Value	Both Non-integral	All Integers	Text only	The length of her enlarged photograph is $12 \frac{1}{2}$ cm.
SC3	Scale	Missing Value	Both Non-integral	Both integers and non-integers	Text only	The size of the enlarged copy of the soccer team is $7 \frac{1}{2}$ inches by $10 \frac{1}{2}$ inches.
SC4	Scale	Missing Value	Both Non-integral	All Integers	Text only	Justin will need to take 18 shoe-steps.
SC5	Scale	Missing Value	Both Integral	All Integers	Graphic	Locations A,C and D will hear the radio signals.
SC6	Scale	Missing Value	Both Integral	All Integers	Text only	One foot on the scale model represents 369 feet of the real building.
SC7	Scale	Missing Value	Some Non-integral	Both integers and non-integers	Text only	One foot on the scale model represents 656 feet.
SC8	Scale	Missing Value	Some Non-integral	Both integers and non-integers	Text only	The height of the real ElmSt Center is 981 feet.
SC9	Scale	Missing Value	Some Non-integral	Both integers and non-integers	Text only	The height of the real tractor is $8 \frac{2}{3}$ feet tall or 8 ft. 8 inches
SC10	Scale	Missing Value	Some Non-integral	Both integers and non-integers	Text only	The height of the real life tractor is 8 feet.
SC11	Scale	Missing Value	Both Non-integral	All Integers	Graphic	A little more than 15 miles. ≈ 15.5 miles

Rates – Buy/consume

New code	Item Type	Rate Subtopic	Multiplicative relationship within and across ratios	Numbers	Format of Item	Solution
RC1	Rate Comparison	Buy/produce/consume	None	None	Graph	Orchard B sells more expensive apples.
RC2	Rate Comparison	Buy/produce/consume	None	None	Graph	Orchard B sells the more expensive apples.
RC3	Rate Comparison	Buy/produce/consume	None	None	Graph	Orchard B sells more expensive apples.
RC4	Missing Value	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Table	6 ounces will cost \$1.125 16 ounces will cost \$3.00
RC5	Rate Comparison	Buy/produce/consume	Both Integral	All Integers	Text only	Tom is correct. Both cars get the same number of miles per gallon of gas.
RC6	Missing Value	Buy/produce/consume	Both Non-integral	All Integers	Graph	Sam will need to work 30 hours to make \$200. Sam earns an hourly wage of \$6.67.
RC7	Rate Comparison	Buy/produce/consume	Both Non-integral	All Integers	Table	Table A represents the cost of someone entering the park and taking different numbers of rides.
RC8	Rate Comparison	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Graph	Graph B represents the cost of someone entering the park and taking a different number of rides.
RC9	Rate Comparison	Buy/produce/consume	Both Non-integral	All Integers	Text only	Mrs. White's students got more pizza.
RC10	Rate Comparison	Buy/produce/consume	Some Non-integral	All Integers	Graphic	Tania's family get more pizza.
RC11	Missing Value	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Table	Marilyn will need $4 \frac{3}{8}$ cups of water to add to her rice.
RC12	Missing Value	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Table	Marilyn will need $4 \frac{1}{2}$ cups of water to add to her rice.
RC13	Rate Comparison	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Graph	It would cost \$9.00 for 3 pounds of candy.
RC14	Rate Comparison	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Text only	The 20 ounce box costs less per ounce.
RC15	Rate Comparison	Buy/produce/consume	Both Non-integral	Both integers and non-integers	Text only	The 15 ounce box costs the least per ounce.
RC16	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Sylvia is correct.
RC17	Rate Comparison	Buy/produce/consume	Both Non-integral	All Integers	Table	Krisan is correct. Sturdy Picker Uppers cost less per sheet.
RC18	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Kira's heart will beat 4320 times in one hour.
RC19	Missing Value	Buy/produce/consume	Some Non-integral	All Integers	Text only	Max's heart will beat 72 times in 60 seconds.
RC20	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Susan will take 15 minutes to type her essay.

Rates – Buy/Consume continued...

RC21	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Joe will take 3 minutes to type 150 words.
RC22	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Michelle can type 360 words in 8 minutes.
RC23	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Nate uses 60 gal. of water to take a 15 minute shower.
RC24	Missing Value	Buy/produce/consume	Both Non-integral	All Integers	Text only	Karen uses 58 1/2 gallons of water in 13 minutes.
RC25	Missing Value	Buy/produce/consume	Some Non-integral	All Integers	Text only	Bob will use 42 gallons of water to take a 9 minute shower.
RC26	Missing Value	Buy/produce/consume	Some Non-integral	All Integers	Text only	Bob's shower will use 78 gallons of water to take a 13 minute shower.
RC27	Missing Value	Buy/produce/consume	Both Non-integral	All Integers	Text only	Leslie's dog will eat 4 1/2 pounds of food in 21 days
RC28	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Paul's dog will take 67 1/2 days to eat 45 pounds of food.
RC29	Missing Value	Buy/produce/consume	Some Non-integral	All Integers	Text only	Paul's dog will take 54 days to eat 45 pounds of dog food.
RC30	Missing Value	Buy/produce/consume	Some Non-integral	All Integers	Text only	Paul's dog will take 54 days to eat 18 pounds of dog food
RC31	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Jack needs \$24 to buy 8 watermelons.
RC32	Missing Value	Buy/produce/consume	Both Non-integral	All Integers	Text only	Jack will spend \$17.50 for watermelons
RC33	Missing Value	Buy/produce/consume	Some Non-integral	All Integers	Text only	Kira's heart will beat 72 beats in one minute.
RC34	Rate Comparison	Buy/produce/consume	Some Non-integral	All Integers	Text only	Pen set A is the least expensive pen set.
RC35	Rate Comparison	Buy/produce/consume	Both Integral	All Integers	Table	Krisan's strategy does work.
RC36	Missing Value	Buy/produce/consume	Both Integral	All Integers	Text only	Sarah will be paid \$42.00.
RC37	Missing Value	Buy/produce/consume	Both Non-integral	All Non-integer	Table	Jamie will need 58 1/3 cups of mix.
RC38	Rate Comparison	Buy/produce/consume	Both Non-integral	All Integers	Text only	Jamie is correct
RC39	Rate Comparison	Buy/produce/consume	None	Both integers and non-integers	Text only	1) \$3.59 divided by 12 bars means one bar costs 0.299 dollars. 2) 12 bars divided by \$3.59 equals \$3.33

Non-Proportional

<i>New code</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
NP1	Non-proportional	None	All Integers	Text only	Page 32
NP2	Non-proportional	None	All Integers	Text only	No, the cost \$2 for each mile plus the \$80 for the bus.
NP3	Non-proportional	None	All Integers	Text only	No, your height isn't proportional to your age.
NP4	Non-proportional	None	All Integers	Text only	No, your height is not proportional to your age.
NP5	Non-proportional	None	All Integers	Text only	Kim will have run 21 laps.
NP6	Non-proportional	None	All Integers	Equation	No, it would cost \$13. The cost is \$3 per ride. Plus \$10 for admission.
NP7	Non-proportional	None	All Integers	Text only	B
NP8	Non-proportional	None	All Integers	Text only	David will be 20 years old.
NP9	Non-proportional	None	All Integers	Text only	It will take Rob's two sections four hours long to dry.
NP10	Non-proportional	None	All Integers	Graphic	18 chairs
NP11	Non-proportional	None	All Integers	Graphic	Weston can make 10 triangles.
NP12	Non-proportional	None	All Integers	Graphic	Sixteen cards fit on a 12inch by 12inch book.

Similarity

<i>New code</i>	<i>Topic</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
S1	Similarity	Missing Value	Some Non-integral	All Integers	Graphic	The missing length is 120 feet.
S2	Similarity	Missing Value	Some Non-integral	All Integers	Graphic	The side length will be 770 ft.
S3	Similarity	Rate Comparison	Some Non-integral	All Integers	Text only	Rectangles B and D are similar.
S4	Similarity	Missing Value	Some Non-integral	All Integers	Graphic	The area of Rectangle B is 216in ²
S5	Similarity	Ratio comparison	Both Integral	All Integers	Graphic	John is correct. The triangles are similar.
S8	Similarity	Rate Comparison	Both Non-integral	All Integers	Graphic	John is correct. The triangles are similar.
S6	Similarity	Missing Value	Both Integral	All Integers	Graphic	The length of the new playground is 240 feet.
S7	Similarity	Rate Comparison	Some Non-integral	All Integers	Text only	Rectangles A and C are similar.
S11	Similarity	Rate Comparison	Both Non-integral	Both integers and non-integers	Graphic	John is correct. The triangles are similar.
S9	Similarity	Missing Value	Both Non-integral	All Integers	Graphic	The new playground will have two times more fencing than the old playground.
S10	Similarity	Ratio comparison	Some Non-integral	All Integers	Text only	Leslie is correct
S12	Similarity	Missing Value	Both Non-integral	All Integers	Graphic	One roll will be enough to put fence around the new playground.
S13	Similarity	Rate Comparison	Some Non-integral	All Integers	Text only	Rectangles A and D are similar.
S14	Similarity	Rate Comparison	Both Non-integral	All Integers	Graphic	Diane is correct. The triangles are not similar.
S15	Similarity	Rate Comparison	Some Non-integral	All Integers	Graphic	The area of the new playground will be four times as large as the area of the old playground.
S16	Similarity	Rate	Some Non-integral	All Integers	Graphic	X is 160 feet.
S18	Similarity	Missing Value	Some Non-integral	All Integers	Graphic	The area of Rectangle B is 216in squared.
S17	Similarity	Missing Value	Both Integral	All Integers	Graphic	The area of Rectangle B is 9 times larger than the area of Rectangle A.
S19	Similarity	Missing Value	Both Non-integral	All Integers	Graphic	The value of X is 93 1/3 feet.
S20	Similarity	Missing Value	Both Non-integral	Both integers and non-integers	Graphic	X is 21 feet.
S21	Similarity	Rate Comparison	Some Non-integral	All Integers	Text only	Laura is correct.
S22	Similarity	Rate Comparison	Some Non-integral	All Integers	Graphic	The school used a scale factor of 1.5.
S23	Similarity	Rate Comparison	Both Non-integral	All Integers	Graphic	The school used a scale factor of 1½
S24	Similarity	Missing Value	Both Non-integral	Both integers and non-integers	Graphic	The width of the new garden is 10.5 feet.
S25	Similarity	Missing Value	Both Non-integral	All Integers	Graphic	The new playground will have 2 2/3 times more fencing than the old playground.
S26	Similarity	Rate Comparison	Both Non-integral	Both integers and non-integers	Graphic	The area of the new playground will be 2 1/4 times larger than that of the old playground.
S27	Similarity	Rate Comparison	Some Non-integral	All Integers	Graphic	The 3' by 2' and 9' by 6' rectangles are similar.

Qualitative

<i>New code</i>	<i>Name</i>	<i>Item Type</i>	<i>Rate Subtopic</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Slope or Equation</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
Q1	Qualitative	Qualitative	Speed	None		None	Text only	a) faster
S1	Qualitative	Missing Value		Some Non-integral		All Integers	Graphic	The missing length is 120 feet.
Q2	Qualitative	Qualitative	Speed	None		None	Text only	b) Nick ran slower today.
Q3	Qualitative	Qualitative	Speed	None		None	Text only	a) Nick ran faster today.
Q4	Qualitative	Qualitative	Speed	None		None	Text only	b) Nick ran slower today.
Q5	Qualitative	Qualitative	Speed	Both Integral		All Integers	Text only	c) Nick ran the same speed today & yesterday.
S5	Qualitative	Ratio comparison		Both Integral		All Integers	Graphic	John is correct. The triangles are similar.
Q6	Qualitative	Qualitative	Speed	Some Non-integral		All Integers	Text only	b) Nick ran slower today.
Q7	Qualitative	Qualitative	Speed	Some Non-integral		All Integers	Text only	a) Nick ran faster today.
Q8	Qualitative	Qualitative	Speed	Both Integral		All Integers	Text only	They took the same amount of time to get to school.
Q9	Qualitative	Qualitative	Speed	Both Non-integral	Slope	All Integers	Graph	Graph B
Q10	Qualitative	Qualitative	Speed	None		All Integers	Text only	d) There is not enough information to tell.
S10	Qualitative	Ratio comparison		Some Non-integral		All Integers	Text only	Leslie is correct
Q11	Qualitative	Qualitative	Speed	Some Non-integral		All Integers	Text only	b) Joanne
Q12	Qualitative	Qualitative	Speed	Both Integral	Slope	None	Graph	Graph C
S12	Qualitative	Missing Value		Both Non-integral		All Integers	Graphic	One roll will be enough to put fence around the new playground.
Q13	Qualitative	Qualitative	Density	None		None	Text only	Sherwood Forest.
S13	Qualitative	Rate Comparison		Some Non-integral		All Integers	Text only	Rectangles A and D are similar.
Q14	Qualitative	Qualitative	Density	None		None	Text only	Sherwood Forest.
S14	Qualitative	Rate Comparison		Both Non-integral		All Integers	Graphic	Diane is correct. The triangles are not similar.
Q15	Qualitative	Qualitative	Density	None		None	Text only	Tucker Forrest.
Q16	Qualitative	Qualitative	Density	Both Non-integral		All Integers	Text only	Both forests have the same number of trees per acre.

Rate – Distance, Rate, and Time

<i>New code</i>	<i>Topic</i>	<i>Item Type</i>	<i>Rate Subtopic</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Slope or Equation</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
RS1	Rate DRT	Rate Comparison	Speed	Some Non-integral		Both integers and non-integers	Text only	Ashley walks faster.
RS2	Rate DRT	Rate Comparison	Speed	Both Non-integral	Slope	None	Graph	Matt ran faster.
RS3	Rate DRT	Missing Value	Speed	Some Non-integral	Slope	Both integers and non-integers	Graph	The line should be higher on the height axis, and shorter on the time axis.
RS4	Rate DRT	Rate Comparison	Speed	Some Non-integral	Slope	All Integers	Graph	A. Roger's average speed was 60 mph. B. Matt's average speed was 40 mph.
RS5	Rate DRT	Rate	Speed	Some Non-integral		All Integers	Table	Table A represents Sally's walking.
RS6	Rate DRT	Rate comparison	speed	Both Integral	Slope	All Integers	Graph	Jack's graph is correct.
RS7	Rate DRT	Missing Value	Speed	Some Non-integral	Slope	All Integers	graph	Jack's graph is correct.
RS8	Rate DRT	Rate Comparison	Speed	Both Integral		All Integers	Table	B and C
RS9	Rate DRT	Rate	Speed	Both Integral		All Integers	Table	6 miles, 8 miles, 12 miles, and 20 miles
RS10	Rate DRT	Rate Comparison	Speed	Both Non-integral		All Integers	Table	Peter is correct. Both girls walk at the same rate.
RS11	Rate DRT	Rate	Speed	Both Integral		All Integers	Table	Table A represents Carrie's average speed.
RS12	Rate DRT	Missing Value	Speed		Equation	All Integers	Table	$c = d \cdot r$ therefore, 3 miles = 20 r; $r = 3 \text{ miles} / 20 \text{ minutes}$
RS13	Rate DRT	Rate	Speed		Equation	All Integers	Table	d
RS14	Rate DRT	Rate	Speed		Equation	All Integers	Table	d. The train is traveling at a constant rate of speed.
RS15	Rate DRT	rate	Speed		Equation	All Integers	Table	B
RS16	Rate DRT	concept	Speed			All Integers	Text only	d
RS17	Rate DRT	rate	Speed	Both Non-integral		All Integers	Text only	24 miles
RS18	Rate DRT	Rate Comparison	Speed	Both Non-integral		All Integers	Text only	2 1/3 miles
RS19	Rate DRT	Missing Value	Speed	Both Non-integral		All Integers	Text only	C. 8 minutes per mile.
RS20	Rate DRT	Rate	speed	Some Non-integral		all integers	Text only	Train B will reach it's destination in less time.
RS21	Rate DRT	Rate	Speed	Some Non-integral		All Integers	Text only	B. Trey's home is between 1 1/2 and 2 miles from school.
RS22	Rate DRT	rate	speed	Some Non-integral		Both integers and non-integers	Text only	Francis will take 105 minutes to walk 7 miles.

Percents

<i>New code</i>	<i>Topic</i>	<i>Percent Subtopic</i>	<i>Item Type</i>	<i>Multiplicative relationship within and across ratios</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
P1	Percents	discount	Missing Value	None	All Integers	Text only	Sam is not correct. The coat would cost \$56.00 after the discount.
P2	Percents	tip	Missing Value	Both Non-integral	All Integers	Text only	C. The meal plus the tip will cost \$36.00.
P3	Percents	tax	Missing Value	Both Non-integral	All Integers	Text only	John will not have enough money to buy sneakers.
P4	Percents	increase	None	Both Non-integral	All Integers	Text only	b. Beth's average speed on Tuesday will be 18 miles per hour.
P5	Percents	interest	Missing Value	Both Non-integral	All Integers	Text only	Bill is incorrect, Mary will need to pay back \$315.00.
P6	Percents	discount	Missing Value	Both Non-integral	All Integers	Text only	Tom would pay about \$2.80 for the toy.
P7	Percents	discount	Missing Value	Both Non-integral	All Integers	Text only	c) George should pay \$52.90 for dinner.
P8	Percents	tax	None	None	None	Text only	No... it means 25% of the price not 25cents
P9	Percents	tax	Missing Value	Both Non-integral	All Integers	Text only	A. The CD with 10% sales tax will cost \$16.50. B. The CD with 6% sales tax will cost \$15.90.
P10	Percents	tax	Missing Value	Some Non-integral	Both integers and non-integers	Text only	A. The toy will cost \$10.50. B. The toy will cost \$14.07.
P11	Percents	discount	Missing Value	Both Non-integral	Both integers and non-integers	Text only	a) The toy will cost about \$4.50.
P12	Percents	discount	Missing Value	Both Non-integral	Both integers and non-integers	Text only	A) Rachel's candy will cost \$2.60. B) Julia's candy will cost \$3.20.
P13	Percents	increase	Missing Value	Both Integral	All Integers	Text only	Ralph is correct. The population increased by 25%.
P14	Percents	increase	Rate Comparison	None	All Integers	Text only	Ralph did not end up with the same size picture as the original.
P15	Percents	increase	None	None	All Integers	Text only	Jamie is not correct.
P16	Percents	discount	Missing Value	Both Non-integral	Both integers and non-integers	Text only	Suzie is correct. One doll will cost more than \$3.50.
P17	Percents	discount	Rate Comparison	Both Non-integral	Both integers and non-integers	Text only	Finding $\frac{3}{4}$ of \$80 or 75% of \$80 is equivalent to subtracting 25% of \$80 from the original price of \$80.
P18	Percents	discount	Rate Comparison	Both Non-integral	Both integers and non-integers	Text only	Multiplying .75 by \$80 is equivalent to multiplying .25 by \$80 and subtracting that amount from \$80.
P19	Percents	increase	Rate Comparison	None	All Non-integer	Text only	Trevor is not correct.
P20	Percents	increase	Missing Value	Some Non-integral	All Integers	Text only	Brian is correct.
P21	Percents	Percent unknown	Missing Value	Both Integral	All Integers	Text only	B-
P22	Percents	different sized wholes	Rate Comparison	Some Non-integral	All Integers	Text only	C.)

Percents continued....

P23	Percents	different sized wholes	Rate Comparison	None	All Integers	Text only	Sam could eat more pizza if his original pizza was larger than Kim's.
P24	Percents	different sized wholes	Rate Comparison	None	All Integers	Table	There could be more students in Danville than in Westport. For example 200 in Danville %50 would be
P25	Percents	different sized wholes	Rate Comparison	None	All Integers	Table	70 students in Westport; 100 students in Danville
P26	Percents	different sized wholes	Missing Value	None	All Integers	Table	Westport could have 100 students and Danville could have 140 students.
P27	Percents	part unknown	Missing Value	Some Non-integral	All Integers	Text only	No - 30% of 80 is 24 people
P28	Percents	part unknown	Missing Value	Some Non-integral	All Integers	Text only	Jason is not correct - 25% of 80 = 20 Students
P29	Percents	Percent unknown	Missing Value	Both Non-integral	All Integers	Text only	Jon is correct
P30	Percents	Total unknown	Missing Value	Some Non-integral	All Integers	Text only	48 students
P31	Percents	part unknown	Rate Comparison	Some Non-integral	All Integers	Text only	50 students
P32	Percents	part unknown	Missing Value	Some Non-integral	All Integers	Text only	about 150 people
P33	Percents	part unknown	Missing Value	Both Non-integral	All Integers	Text only	C.
P34	Percents	increase	Rate Comparison	Some Non-integral	All Integers	Text only	d.
P35	Percents	part unknown	Missing Value	Some Non-integral	All Integers	Graphic	William is correct. About 25 students stated that pizza is their favorite food.
P36	Percents	Total unknown	Missing Value	Both Non-integral	All Integers	Graphic	A. William about 25 students - 30% of 80 = 24 students A) About 90% B) about 54 students
P37	Percents	part unknown	Missing Value	Some Non-integral	All Integers	Graphic	B) About 54 students
P38	Percents	part unknown	Missing Value	Both Integral	Both integers and non-integers	Text only	A) about 3/5 or 60% of the students; B) 45 students
P39	Percents	part unknown	Missing Value	Both Integral	Both integers and non-integers	Text only	C) 30 students
P40	Percents	meaning of percent less than 1	Missing Value	Both Integral	Both integers and non-integers	Text only	Sandy is correct
P41	Percents	meaning of percent less than 1		Some Non-integral	Both integers and non-integers	Text only	50 people
P42	Percents	meaning of percent less than 1	Missing Value	Some Non-integral	Both integers and non-integers	Text only	Mike did make a mistake. He looked at 75% not .75% which is less than 1%.
P42	Percents	meaning of percent less than 1	Missing Value	Some Non-integral	All Integers	Graph	No - 0.75% is less than 1 % which would make it less than 8 students
P43	Percents	discount	Missing Value	Both Non-integral	All Integers	Text only	\$9
P44	Percents	Percent unknown	Missing Value	Both Non-integral	Both integers and non-integers	Text only	62.50%
P45	Percents	Total unknown	Missing Value	Some Non-integral	Both integers and non-integers	Text only	2.4 inches and 3.6 inches

Rate – Density	New code	Topic	Rate Subtopic	Item Type	Multiplicative relationship within and across ratios	Numbers	Format of Item	Solution
	RD1	Rate	Density	Rate Comparison	Some Non-integral	All Integers	Table	Josh is right. Town B has more raccons per square mile.
	RD2	Rate Density	Density	Rate Comparison	Both Non-integral	All Integers	Text only	Josh is right, Town B has more raccoons per square mile.
	RD3	Rate Density	Density	Rate Comparison	Both Integral	All Integers	Graphic	Models A and C.
	RD4	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Graphic	No, Sandra is not correct, the 6th grade lunch period is a little more than twice as crowded as the 7th grade
	RD5	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Graphic	No, Danni is not correct. Ms. Hawley's classroom is more crowded than mr. Blake's.
	RD6	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Graphic	b) Barnyard A is less crowded than Barnyard B.
	RD7	Rate Density	Density	Rate Comparison	Both Integral	All Integers	Graphic	No Ken is not correct. The flower gardens are equally crowded.
	RD8	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Graphic	No, Sandra is not correct. There is more than double the number of students per square yard.
	RD9	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Graphic	No, Danni is not correct. Ms. Hawley's classroom has more students per square yard than Mr. Blake's
	RD10	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Graphic	b) Barnyard A has less chicks per square foot than Barnyard B
	RD11	Rate Density	Density	Ratio comparison	Both Integral	All Integers	Graphic	No, Ken is not correct. The gardens have the same number of flowers per square foot.
	RD12	Rate Density	Density	Rate Comparison	Both Non-integral	All Integers	Text only	Jefferson Ranch has more acres of pasture per horse.
	RD13	Rate Density	Density	Rate Comparison	Some Non-integral	All Integers	Text only	Belmont Town Forest.
	RD14	Rate Density	Density	Missing Value	Both Non-integral	All Integers	Text only	The population per square mile is about 80 people.(82.4 people per square mikle)
	RD15	Rate Density	Density	Missing Value	Both Integral	All Integers	Text only	2,450 people.
	RD16	Rate Density	Density	Missing Value	Both Integral	All Integers	Text only	C. The total population of Grant is approximately 2700 people.
	RD17	Rate Density	Density	Missing Value	Both Integral	All Integers	Text only	880 people.
	Rd18	Rate Density	Density	Missing Value	Both Integral	All Integers	Text only	9200 people.
	RD19	Rate Density	Density	Missing Value	Both Integral	All Integers	Text only	7800 people.
	RD20	Rate Density	Density	Missing Value	Both Non-integral	Both integers and non-	Text only	7995 people.
	RD21	Rate Density	Density	Rate Comparison	Both Non-integral	All Integers	Text only	Jefferson ranch has more acres of pasture per horse.
	RD22	Rate Density	Density	Rate Comparison	Both Non-integral	All Integers	Text only	Big Horn Ranch has more horses per acre of pasture.

Ratio

<i>New code</i>	<i>Topic</i>	<i>Ratio relationship</i>	<i>Ratio Referent</i>	<i>Numbers</i>	<i>Format of Item</i>	<i>Solution</i>
R1	Ratio	part: whole	Implied	All Integers	Table	Mary is correct.
R2	Ratio	part: whole	implied	All Integers	Table	Mary is correct.
R3	Ratio	part: whole	implied	All Integers	Table	NO -about one-third voted for Jaime
R4	Ratio	part: part	Implied	All Integers	Graphic	Carrie is correct.
R5	Ratio	part: part	explicit	All Integers	Graphic	Judi is correct
R6	Ratio	part: whole	implied	All Integers	Graphic	Hilldale has a greater ratio of students who like pizza.
R7	Ratio			All Integers	Table	False.
R8	Missing Value	part:whole	Implied	All Integers	Text only	There are 105 male athletes.
R9	Ratio	part:whole	implied	All Integers	Text only	The fraction of Fun Run participants that are children is $\frac{4}{7}$.
R10	Ratio	part:part	explicit	All Integers	Text only	A
R11	Ratio	A) Part:part B) Part Whole	A) explicit B) Implied	All Integers	Graphic	1. John is correct. 2. John is incorrect.
R12	Ratio	part: whole	implied	All Integers	Text only	There are 36 marbles in the bag.
R13	Rate Comparison	part: whole	explicit	All Integers	Graphic	The ratio of shaded blocks to total blocks in Model 1 is 1:6 and Model 2 is 1:3.
R14	Ratio	part: whole	explicit	All Integers	Text only	There are 72 M&Ms in the bag.
R15	ratio comparison	part: part	explicit	All Integers	Text only	Lakeview
R16	proportion	part:whole	implied	all integers		9 dogs
R17	ratio	part:whole	implied	percents	Text only	B and C
R18	Ratio	part:part	implied	None	Graphic	A) no B) yes - the relative length of the bars can be used to see the ratios.

Ratio Continued...

R19	ratio	part: whole	implied	All Integers	Text only	36 M and Ms
R20	Ratio	part:part	explicit	All Integers	Table	Pat is correct.
R21	ratio	part: whole	implied	All Integers	table	Mark is correct, 1/3 of the games were won.
R22	Ratio	part: whole	explicit	All Integers	Table	Yesn- itdepends on the number of games
R23	Ratio	part: whole	implied	all integers	Text only	EJ is correct. The ratio of the number of boys to the number of students is 12:20 or 3:5.
R24	Ratio	part: whole	implied	percents	Text only	Courtney is correct.
R25	Ratio	part:part	explicit	All Integers	Table	Dana is correct. The ratio of shots made to shots missed will change.
R26	ratio	part:part	explicit	All Integers	Text only	Josh is correct. The ratio of Hip Hop music to the other two music choices is 16:8 or 4:2.
R27	missing value			some non-integers	Text only	13.5 cups
R28	Ratio	part: whole	implied	All Integers	Text only	25 girls
R29	Ratio	part:part	explicit	All Integers	Text only	9 cups