Unit 10: Fraction Connections (5 days)

Possible Lesson 01 (5 days)

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Lesson Synopsis:
Students use manipulatives and pictorial representations to model and represent fraction and decimal relationships.

TEKS:

4.2 ***Number, operation, and quantitative reasoning. The student describes and compares fractional parts of whole objects or sets of objects. The student is expected to:***

4.2A **Use concrete objects and pictorial models to generate equivalent fractions.** ***Supporting Standard***
4.2B **Model fraction quantities greater than one using concrete objects and pictorial models.** ***Supporting Standard***
4.2C **Compare and order fractions using concrete and pictorial models.** ***Supporting Standard***
4.2D **Relate decimals to fractions that name tenths and hundredths using concrete objects and pictorial models.** ***Readiness Standard***

Underlying Processes and Mathematical Tools TEKS:

4.14 ***Underlying processes and mathematical tools. The student applies Grade 4 mathematics to solve problems connected to everyday experiences and activities in and outside of school. The student is expected to:***

4.14A **Identify the mathematics in everyday situations.**
4.14D **Use tools such as real objects, manipulatives, and technology to solve problems.**

4.15 ***Underlying processes and mathematical tools. The student communicates about Grade 4 mathematics using informal language. The student is expected to:***

4.15A **Explain and record observations using objects, words, pictures, numbers, and technology.**
4.15B **Relate informal language to mathematical language and symbols.**

4.16 ***Underlying processes and mathematical tools. The student uses logical reasoning. The student is expected to:***

4.16B **Justify why an answer is reasonable and explain the solution process.**

Performance Indicator(s):
Create a necklace design using 100 objects (e.g., beads, pasta, cereal, etc.) of three different colors. Then, use a 100s grid to sort the necklace objects by color, and color in the grid accordingly. Record the following for the colors in the necklace design: (1) the fractions represented for each color; (2) the fraction to decimal equivalence for each color; (3) the name in words for each decimal; (4) the order of the fractions and decimals from greatest to least; (5) one comparison statement for the fractions and one comparison statement for the decimals with appropriate symbols; and (6) a problem situation created involving the colors of the necklace that could be answered using fractional pieces and a written justification of the solution.

Copy your colored 100s grid onto three more grids creating a total of four 100s grids. If each 100s grid represents "one whole", find, describe, and record one or more of the colors used in the 100s grid where the fraction and decimal representation is greater than one. (4.2A, 4.2B, 4.2C, 4.2D; 4.14A, 4.14D; 4.15A, 4.15B; 4.16B)
ELPS 5B; 1G

Key Understanding(s):

- An equivalent fraction can be generated from a given fraction by using observations from concrete objects and pictorial models.
- When comparing and ordering fractions, concrete objects and pictorial models can justify that the greater the denominator, the smaller the fraction unit.
- When comparing and ordering fractions with the same denominator, or parts of the same size, concrete objects and pictorial models can justify that the fraction with the greater numerator is the larger fraction because it has more same-size parts.
- When comparing and ordering fractions with the same numerator, concrete objects and pictorial models can justify that the fraction with the larger denominator is the smaller fraction because it has smaller same-size parts.
- The value of two fractional quantities in a real-life situation can be compared, ordered, and justified using a variety of methods, such as concrete objects and pictorial models.
- An equivalent fraction can be generated from a given fraction by using concrete and pictorial models.
- Fractions can be related to decimals that name tenths and hundredths by using concrete objects and pictorial models.
- A mixed number is a number greater than one that represents the sum of two parts: a whole number part and a fractional part.
- A mixed number can be represented using concrete models and pictorial representations.
- A mixed number is represented using more than one of the same concrete or pictorial model where each model represents “one whole.”
- Fractions in real-life situations can involve mixed numbers and improper fractions, both of which can be modeled, compared, and ordered to demonstrate their numerical value in relation to one another.
- Use place value, concrete objects, and pictorial models to compare, order, read, and write decimals involving tenths or hundredths in real-life situations.
- The value of an improper fraction and a mixed number in a real-life situation can be compared and justified from observations using concrete models and pictorial representations.

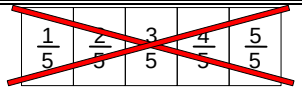
Misconception(s):

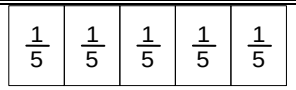
- Some students may think that a set model is not a whole since it refers to a collection of items. The idea of referring to a collection of items as a whole confuses many students, especially if their fraction experiences are limited to area models.
- Some students may think that it is not possible, or may find it very difficult, to model or draw more than one whole to show improper fractions greater than one.

Underdeveloped Concept(s):

- Some students may think that the numerator and the denominator of a fraction share no relationship and confuse which number represents the numerator and which number represents the denominator. Remind students that the total number of equal parts should be the denominator, or bottom number, of the fraction. The numerator, or top number, of the fraction should be the number of parts under consideration.
- Some students may think when a fraction is written using a diagonal line, such as1/3, that the numerator and denominator have the same value. To make a clear distinction between the numerator and denominator, it is better to use a horizontal line as shown here: $\frac{1}{3}$. This form of writing fractions is called “case” fraction form (Galen, 2004).
- Some students may think fraction bars similar to the example below means that one block is worth 1 out of 5, the next block is worth 2 out of 5, etc. This leads to confusion with the concept of fractions.

Incorrect **Correct**





- Some students may think that the fraction with the larger digit has the greater value. Although this is true in some instances, students need to be exposed to problems where this is not true. Also, if students are using fraction strips, circles, or other fraction manipulatives, they will be able to compare fractions without making this common error.

Vocabulary of Instruction:

- decimal
- equivalent fractions
- fraction
- improper fraction
- mixed number

Resources and References:

- National Library of Virtual Manipulatives: http://nlvm.usu.edu/en/nav/vlibrary.html

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
1	**Topics:** • Fractions • Relative size of fractions **Engage 1** Students investigate how a fraction does not change even though the size of the whole does change. **Instructional Procedures:** 1. Place students into 5 groups. Distribute an index card, paper plate, piece of string, 16 counters, or 24 counters to each group. Ask: • **What does quarter of a dollar mean?** *(25 cents)* • **What does a quarter look like as a fraction?** *($\frac{1}{4}$)* 2. Instruct student groups to divide their object or set of objects into fourths. Allow time for students to complete the activity. Monitor and assess student groups to check for understanding. Facilitate a class discussion to debrief student solutions and compare the relative sizes of the fourths. Ask: • **What strategy did you use to divide your object(s)?** *Answers may vary.* • **Is a fourth of the string the same as a fourth of the paper plate? Explain.** *(no) Answers may vary. A fourth of an object depends upon the object itself and its size, shape, etc.*	**SPIRALING REVIEW** **MATERIALS** • index card (1 per teacher) • plate (paper) (1 per teacher) • string (12 inches) (1 per teacher) • counter (40 per teacher) • math journal (1 per student)

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
	• **How could you separate a glass of water into fourths?** *Answers may vary. Use measuring cups and pour water from the glass into the cups until each one holds the same amount of water; etc.* • **How could you separate beans in a jar into fourths?** *Answers may vary. Take out all the beans and count them, and then divide that number by 4; etc.* 3. Instruct students to record how they separated their group's object(s) into fourths in their math journal.	
2	**Topics:** • Fraction and money relationships **Explore/Explain 1** Students investigate the relationship between fractions and money using parts of a dollar. **Instructional Procedures:** 1. Prior to instruction, create Parts of a Dollar Bag for every 2 students and Parts of a Dollar Bag for every teacher by placing 1 dollar bill, 10 dimes, and 100 pennies in a plastic zip bag. If commercial money manipulatives are not available, use class resource (optional): **Parts of a Dollar** to create Parts of a Dollar Bag by copying on cardstock, cutting apart, laminating, and placing in a plastic zip bag. 2. Place students in pairs and distribute Parts of a Dollar Bag to each pair. Facilitate a class discussion about what students already know about dollars and parts of a dollar. Ask: • **Have you ever used a penny to pay for something?** *Answers may vary.* • **Have you ever used a dime to pay for something?** *Answers may vary.* • **Have you ever used a dollar to pay for something?** *Answers may vary.* 3. Remind students that they just divided different items into fractional parts to show that one thing can be divided into equal parts. Ask: • **Can a dollar be divided into equal parts? Explain.** *(yes) Answers may vary. A dollar can be divided into 4 quarters; 20 nickels; etc.* • **Can a dollar be divided into 10 equal parts? Explain.** *(Yes; a dime is 1 of 10 equal parts of a dollar.)* • **Can a dollar be divided into 100 equal parts? Explain.** *(Yes; a penny is 1 of 100 equal parts of a dollar.)* 4. Display only the problem from teacher resource: **Parts of a Dollar – Dimes**. Instruct student pairs to use the dimes from their Parts of a Dollar Bag to model the problem and record their model in their math journal. Allow time for students to complete the activity. Monitor and assess student pairs to check for understanding. 5. Invite a pair of students to model the relationship between 3 dimes and a dollar. Using the displayed	**SPIRALING REVIEW** **ATTACHMENTS** • Class Resource (optional): **Parts of a Dollar** (1 per 2 students, 1 per teacher) • Teacher Resource: **Parts of a Dollar – Dimes** (1 per teacher) • Teacher Resource: **Parts of a Dollar – Pennies** (1 per teacher) • Teacher Resource: **Parts of a Dollar Practice KEY** (1 per teacher) • Handout: **Parts of a Dollar Practice** (1 per student) **MATERIALS** • commercial money manipulatives (1 dollar bill, 10 dimes, 100 pennies) (1 set per 2 students, 1 set per teacher) • plastic zip bag (sandwich sized) (1 per 2 students, 1 per teacher) • cardstock (optional) (2 sheets per 2 students, 2 sheets per teacher) • scissors (optional) (1 per teacher) • math journal (1 per student)

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
	teacher resource: **Parts of a Dollar – Dimes**, reveal each section and facilitate a class discussion about the relationship between the models, symbolic, and verbal descriptions for the problem situation and parts of a dollar. 6. Display only the problem from teacher resource: **Parts of a Dollar – Pennies**. Instruct student pairs to use the pennies from their Parts of a Dollar Bag to model the problem and record their model in their math journal. Allow time for students to complete the activity. Monitor and assess student pairs to check for understanding. 7. Invite a pair of students to model the relationship between 67 pennies and a dollar. Using the displayed teacher resource: **Parts of a Dollar – Pennies**, reveal each section and facilitate a class discussion about the relationship between the models, symbolic, and verbal descriptions for the problem situation and parts of a dollar. 8. Distribute handout: **Parts of a Dollar Practice** to each student. Instruct students to complete the handout individually. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Facilitate a class discussion to debrief student solutions and demonstrate how different representations of coins could be used for each problem.	**TEACHER NOTE** For teacher resource: **Parts of a Dollar – Pennies**, some students may see that counting-out 6 dimes and 7 pennies is easier than counting-out 67 pennies. Point out to these students that 6 dimes is 6-tenths of a dollar and the 7 pennies are 7-hundredths of a dollar and then show the same in decimal form →0.67.
3	**Topics:** • Fraction and decimal relationships **Explore/Explain 2** Students create a flip book to model fraction and decimal relationships. **Instructional Procedures:** 1. Distribute 2 different colored sheets of construction paper, a pair of scissors, and handout: **Magic Flip Book Directions** to each student. 2. Display teacher resource: **Magic Flip Book Directions**. Display 2 different colored sheets of construction paper and a pair of scissors, demonstrate the process of how to create a flip book. Instruct students to replicate the procedures using their materials. Allow time for students to complete the activity. Monitor and assess students to check for understanding. 3. Instruct the students to open their flip book and write the word "**Fraction**" at the top of the second column and the word "**Grid**" at the top of the third column. Demonstrate the process using the displayed flip book.	**SPIRALING REVIEW** **ATTACHMENTS** • Handout: **Magic Flip Book Directions** (1 per student) • Teacher Resource: **Magic Flip Book Directions** (1 per teacher) • Teacher Resource: **Mini 100s Grids** (1 per teacher) • Handout: **Mini 100s Grids** (1 per 2 students) **MATERIALS** • construction paper (9" x 12", colored) (2 sheets per student, 2 sheets per teacher) • scissors (1 per student, 1 per teacher) • glue stick (1 per student) • whiteboard (student-sized) (1 per student)

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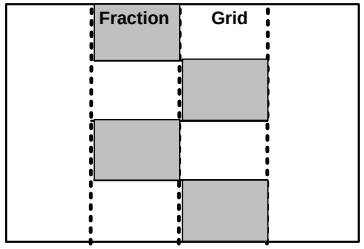
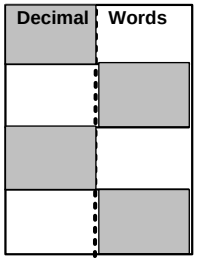
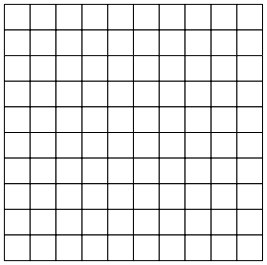


4. Instruct students to close the booklet, reopen it from the center flaps, and label the top of the left column "**Decimal**" and the right column "**Words**." Demonstrate the process using the displayed flip book.



5. Place students in pairs and distribute handout: **Mini 100s Grids** to each pair.
6. Display a 100s grid from teacher resource: **Mini 100s Grids**. Remind students that they used money to show the relationship between fractions and decimals. Explain to student that 1 grid will equal 1 whole.



= 1 whole

Ask:

- **How could you use a 100s grid to show a decimal number?** *Answers may vary. Shade a certain number of squares on the grid to show a decimal amount as "some number out of 100" or as "some number out of ten"; etc.*
- **How could you use a 100s grid to show a fraction?** *Answers may vary. Shade a certain number of squares on the grid to show a fractional amount as "some number out of 100" or as "some number out of ten"; etc.*

- dry erase marker (1 per student)

RESOURCES & REFERENCES
Additional practice for visualizing fractions can be accessed at National Library of Virtual Manipulatives: http://nlvm.usu.edu/en/nav/vlibrary.html

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
	• **How could you use a 100s grid to show a decimal or fraction number greater than 1?** *Answers may vary. Determine how many wholes there are and shade an entire 100s grid for each whole, then shade the remaining part on another 100s grid; etc.* • **How would you represent 3.7 with 100s grids?** *(Shade 3 entire 100s grids and then shade 70 out of the 100 boxes of a fourth hundreds grid.)* • **How would you represent 2.45 with 100s grids?** *(Shade 2 entire 100s grids and then shade 45 out of the 100 boxes of a third hundreds grid.)* 7. Invite several students to name a number. Using the displayed teacher resource: **Mini 100s Grids**, shade in the values given by students, including those greater than and/or equal to a whole. Instruct students to name the fraction and the decimal represented by the shaded part of the grid as well as the fraction and decimal represented by the un-shaded part of the grid. 8. Display a number line for the class to see. Facilitate a class discussion about how to model each of the numbers from the displayed teacher resource: **Mini 100s Grids** on the number line as a fraction and a decimal, determining if there are any equivalent fractions to the numbers named, and how the number line can be used to compare and order a set of fractions. 9. Distribute a glue stick to each student. Instruct student pairs to cut apart the 100s grids from handout: **Mini 100s Grids** for each student and glue 1 100s grid onto 2 of the sections and 2 hundred grids onto the remaining 2 sections of their flip booklets under the column labeled "**Grid**." 10. Instruct students to individually shade-in 4 different fractional/decimal amounts of their choosing on the 100s grids, with 2 amounts being greater than 1, then determine and record the amount shaded on the grids under the "**Fraction**," "**Decimal**," and "**Words**" columns. Allow time for students to complete the activity. Monitor and assess students to check for understanding. 11. Instruct students to check the fractions they have created for equivalent forms and record the fractional amount for the 2 numbers greater than 1 as both an improper fraction and mixed number. 12. Distribute a whiteboard and dry erase marker to each student. Instruct student pairs to exchange flip books and "guess" and "check" each other's solutions by opening the flip book with only the "**Fraction**" and "**Grid**" columns showing, verify the recorded fraction is correct based on the grid, determine and record the decimal and word forms on the whiteboard, and verify their solutions by opening the center flap of the flip book. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Facilitate a class discussion about the strategies used to determine the fraction, decimal, and word forms for each 100s grid.	
4 – 5	**Topics:** • Fraction and decimal relationships **<u>Elaborate 1</u>** Students model fraction and decimal relationships using models.	**SPIRALING REVIEW** **ATTACHMENTS** • Teacher Resource: **Cereal Necklaces Recording Sheets KEY**(1 per teacher)

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
	Instructional Procedures: 1. Prior to instruction, create a Cereal Necklace Bag for each student and each teacher by placing 200 pieces of ring shaped colored cereal (e.g., Fruit Loops™) or pasta in a plastic zip bag. 2. Demonstrate using the Cereal Necklace Bag and 2, 16 inch pieces of string to create a necklace with 3 green and 1 red pieces of cereal and another necklace with 3 green and 4 red pieces of cereal. Facilitate a class discussion about the fractions represented by the necklaces. • **What fraction represents the green pieces of cereal on each necklace?** *(The necklace with 3 green pieces of cereal and 1 red piece of cereal is represented by the fraction $\frac{3}{4}$, and the necklace with 3 green pieces of cereal and 4 red pieces of cereal is represented by the fraction $\frac{3}{7}$.)* • **Which fractional value of green is the greatest? Explain using the terms numerator and denominator.** *($\frac{3}{4}$ is greater than $\frac{3}{7}$.) Answers may vary. When the numerators are the same and the denominators are different, the fraction with the larger denominator is the smaller fraction because it has smaller same-size parts; because the numerators are the same, there are the same number of parts, however, the fraction with the smaller denominator means the parts are bigger, so the fraction with the smaller denominator would be the greater fractional amount; etc.* 3. Demonstrate using the Cereal Necklace Bag and 2, 16 inch pieces of string to create a necklace with 1 green and 4 red pieces of cereal and another necklace with 3 green and 2 red pieces of cereal. Facilitate a class discussion about the fractions represented by the necklaces. • **What fraction represents the green pieces of cereal on each necklace?** *(The necklace with 1 green piece of cereal and 4 red pieces of cereal is represented by the fraction $\frac{1}{5}$, and the necklace with 3 green pieces of cereal and 2 red pieces of cereal is represented by the fraction $\frac{3}{5}$.)* • **Which fractional value of green is the greatest? Explain using the terms numerator and denominator.** *($\frac{3}{5}$ is greater than $\frac{1}{5}$.) Answers may vary. When the denominators are the same and the numerators are different, the fraction with the greater numerator is the larger fraction because it has more same-size parts; etc.* 4. Place students in groups of 4. Distribute a Cereal Necklace Bag, 1 pink, 1 orange, 1 green, and 1 yellow map pencil, handout: **Cereal Necklaces Recording Sheets**, and handout: **100s Grid** to each student. 5. Display teacher resource: **Cereal Necklaces Recording Sheets**. Instruct students to examine page 1 of handout: **Cereal Necklaces Recording Sheets**. Explain to students that for each necklace, there will be 100 pieces of cereal.	• Handout: **Cereal Necklaces Recording Sheets** (1 per student) • Teacher Resource: **Cereal Necklaces Recording Sheets** (1 per teacher) • Handout: **100s Grid** (1 per student) • Teacher Resource: **Combining Necklaces** (1 per teacher) • Handout: **Combining Necklaces** (1 per student) • Teacher Resource (optional): **Basic Recipe to Dye Pasta** (1 per teacher) **MATERIALS** • cereal or pasta (ring shaped, colored) (200 pieces per student, 200 pieces per teacher) • string (16") (4 per teacher) • scissors (1 per teacher, 1 per student) • plastic zip bag (sandwich sized) (1 per student) • map pencil (1 pink, 1 orange, 1 green, 1 yellow) (1 set per student, 1 set per teacher) • glue stick (1 per student) • math journal (1 per student) **TEACHER NOTE** Colored pasta, such as elbow macaroni, may be used instead of cereal. Teacher Resource (optional) **Basic Recipe to Dye**

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
	Ask: • **According to the recording sheet, half of this necklace must be made with green pieces of cereal. How could you use this grid to determine how many green pieces you will need?** *Answers may vary. Count out the number of cereal pieces needed until half of the grid, or 50 boxes, have green pieces of cereal in them; etc.* 6. Instruct students to place 50 green pieces of cereal on their handout: **100s Grid**. 7. Using the displayed teacher resource: **Cereal Necklaces Recording Sheets**, demonstrate shading 50 of the boxes green. Instruct students to replicate the process on page 1 of their handout: **Cereal Necklaces Recording Sheets** to represent the cereal placed on their handout: **100s Grid**. Allow time for students to complete the activity. Monitor and assess students to check for understanding. 8. Facilitate a class discussion about the orange pieces of the necklace. Ask: • **According to the handout, what fraction of the necklace is made up of orange cereal pieces?** *($\frac{1}{10}$)* • **How can you determine how many orange cereal pieces to use out of 100?** *Answers may vary. Find $\frac{1}{10}$ of the grid and count out that number of pieces; etc.* • **Based on this information, how many orange cereal pieces will you need?** *(10 pieces)* 9. Instruct students to place 10 orange pieces of cereal on their handout: **100s Grid**. 10. Using the displayed teacher resource: **Cereal Necklaces Recording Sheets**, demonstrate shading 10 of the boxes orange. Instruct students replicate the process on page 1 of their handout: **Cereal Necklaces Recording Sheets** to represent the cereal placed on their handout: **100s Grid**. Allow time for students to complete the activity. Monitor and assess students to check for understanding. 11. Facilitate a class discussion about the pink pieces of the necklace. Ask: • **According to the handout, what color should the remainder of the grid be?** *(pink)* • **How can you be sure that the remainder of the grid represents two-fifths of the grid?** *Answers may vary. Separate the grid into fifths and then count to see if $\frac{2}{5}$ of the grid actually remains; etc.*	**Pasta** provides details on how to dye pasta. **STATE RESOURCES** • **MTC 3 – 5**: Fractions • **MTR 3 – 5**: How Do I Compare? • **Mathematics TEKS Toolkit**: TEKS Clarifying Activity/Lesson/Assessment • **TEXTEAMS: Rethinking Elementary Mathematics Part I**: Fraction Rectangles Task Card; Same Name Task Card; *More* Same Name Task Card; Fraction Riddles Task Card; Tenths Task Card; NOT Tenths Task Card; Hundredths Task Card; Show Me! Tell Me! Task Card • **TEXTEAMS: Rethinking Elementary Mathematics Part II:** Fraction Frame Game; Dice Fractions 2

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	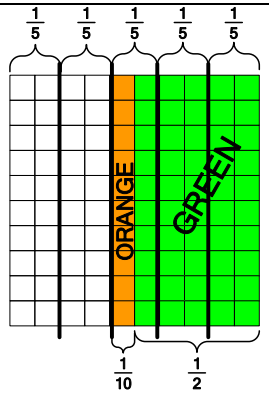 12. Instruct students to fill the remainder of the boxes with pink pieces of cereal on their handout: **100s Grid**. 13. Instruct student groups to count the remaining boxes on page 1 of their handout: **Cereal Necklaces Recording Sheets** and shade them pink to represent the cereal placed on their handout: **100s Grid**. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Ask: • **How many boxes are shaded pink?** *(40 boxes)* 14. Instruct students to examine the "**Fraction → Decimal**" section on page 1 of their handout: **Cereal Necklaces Recording Sheets**. Ask: • **How could you use the 100s grid to determine the decimal amount represented by each fractional color amount shown?** *Answers may vary. Count the number of squares to determine the number of tenths or hundredths; etc.* 15. Instruct student groups to determine and record the fraction to decimal equivalents for each cereal amount shown on page 1 of their handout: **Cereal Necklaces Recording Sheets** and then to record these amounts in word form. Allow time for students to complete the activity. Monitor and assess students to check for understanding. 16. Using the displayed teacher resource: **Cereal Necklaces Recording Sheets**, invite several student volunteers to record their solutions. 17. Instruct students to examine the "**Order fractions and decimals from greatest to least and compare**" section on page 1 of their handout: **Cereal Necklaces Recording Sheets**. Ask: • **How could you use the 100s grid to help order and compare each fractional color amount shown?** *Answers may vary. Use the number of colored squares on the grid to order and compare the amounts given; etc.* 18. Instruct student groups to use the 100s grid on their handout: **Cereal Necklaces Recording Sheet** to determine the fraction and decimal orders for each cereal amount shown and to record these amounts	**TEACHER NOTE** Decimal representations on teacher resource: **Cereal Necklaces Recording Sheets KEY** are recorded as tenths and hundredths when necessary. Students may provide all solutions as hundredths.

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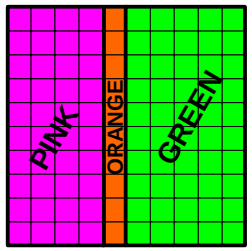
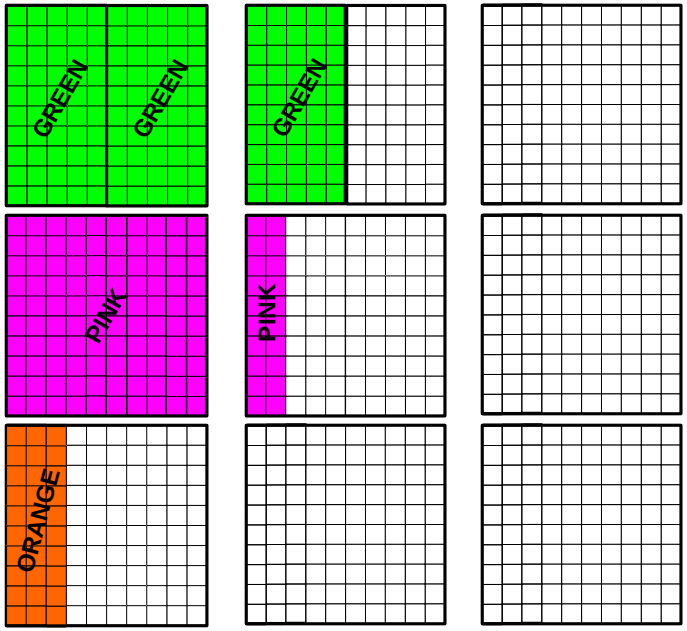
	from greatest to least with the appropriate comparison symbols. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Facilitate a class discussion about the strategies used to compare fractions and how the order of the fractions is the same as the order of the decimals. 19. Facilitate a class discussion about creating a problem that could be answered using the fractional pieces of the necklace, as well as the solution to the problem. Ask: • **Which cereal color makes up more than one-tenth of the necklace, but less than one-half?** *(pink)* • **How many cereal pieces were not pink for this necklace?** *(60 pieces)* 20. Instruct student groups to create and record a problem and solution on page 1 of their handout: **Cereal Necklaces Recording Sheets** that could be answered using the fraction/decimal information. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Facilitate a class discussion for students to share their problem situations. 21. Instruct student groups to complete the remainder of handout: **Cereal Necklaces Recording Sheets**. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Facilitate a class discussion to debrief student solutions and justifications for comparing fractions with like numerators or like denominators, as needed. 22. Distribute handout: **Combining Necklaces** to each student. 23. Display teacher resource: **Combining Necklaces**. Demonstrate shading the first grid according to the completed/colored grid from page 1 of teacher resource: **Cereal Necklaces Recording Sheets**.  24. Instruct students to color the 3 grids on the top row of their handout: **Combining Necklaces** the same as the displayed grid on teacher resource: **Combining Necklaces**. Allow time for students to complete the activity. Monitor and assess students to check for understanding. Facilitate a class discussion about fractions greater than one whole. Ask: • **If each grid represents one whole and you combined all three grids, which colors could be represented by a fraction greater than one whole? How do you know?** *(pink and green) Answers may vary. Pink would be greater than one whole because there are 40 units in each grid colored pink,*	

Suggested Day	Suggested Instructional Procedures	Notes for Teacher

and 40 x 3 = 120. We only need 100 for one whole. Green would be greater than one whole because there are 50 units in each grid colored green, and 50 x 3 = 150. We only need 100 for one whole; etc.

25. Instruct students to combine the like colors from each of the 3 grids on their handout: **Combining Necklaces** and then shade the appropriate grid(s) to represent the combined fractional amount for each color. Allow time for students to color the representations for green, pink, and orange. Monitor and assess students to check for understanding. Facilitate a class discussion to debrief student solutions.

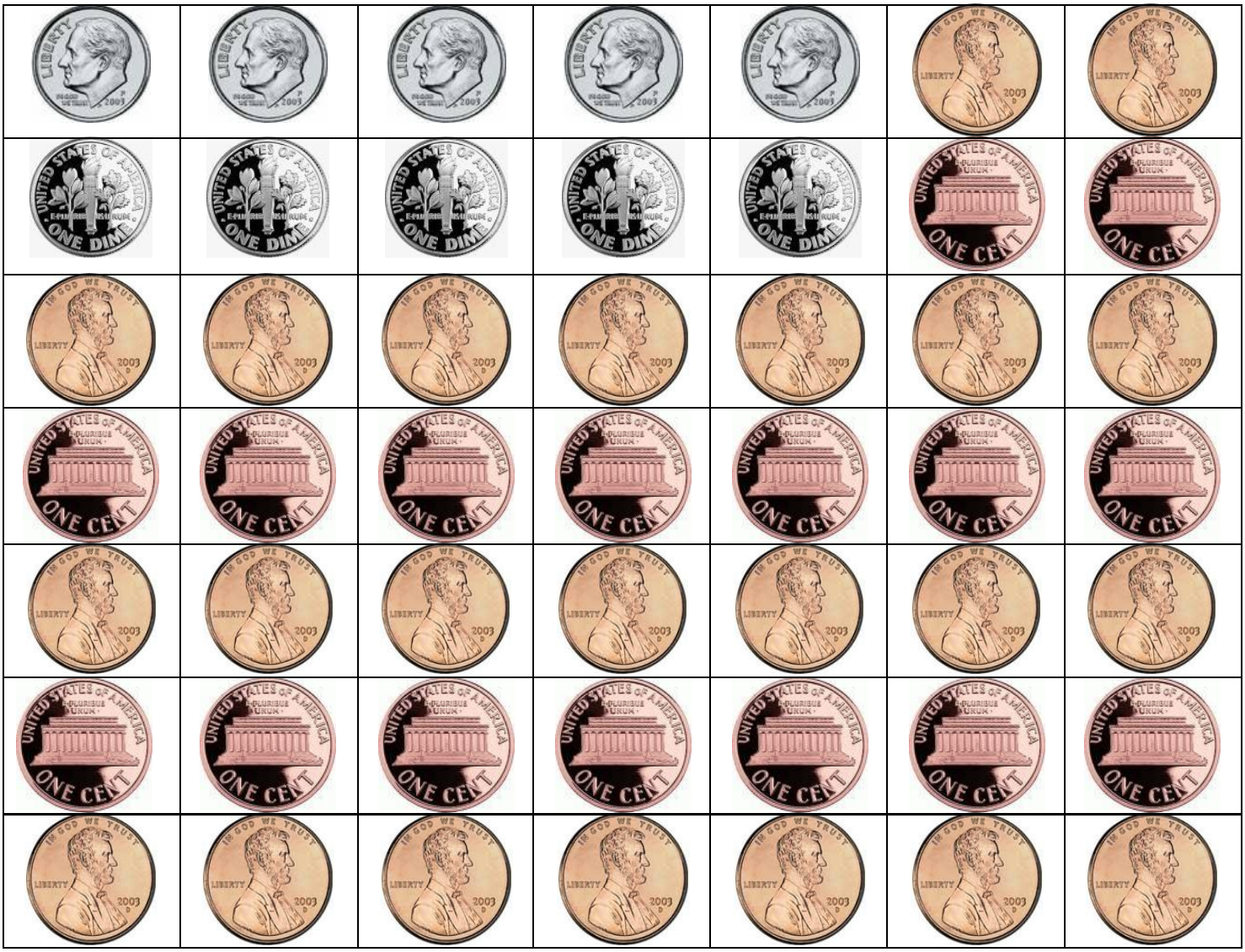


Ask:

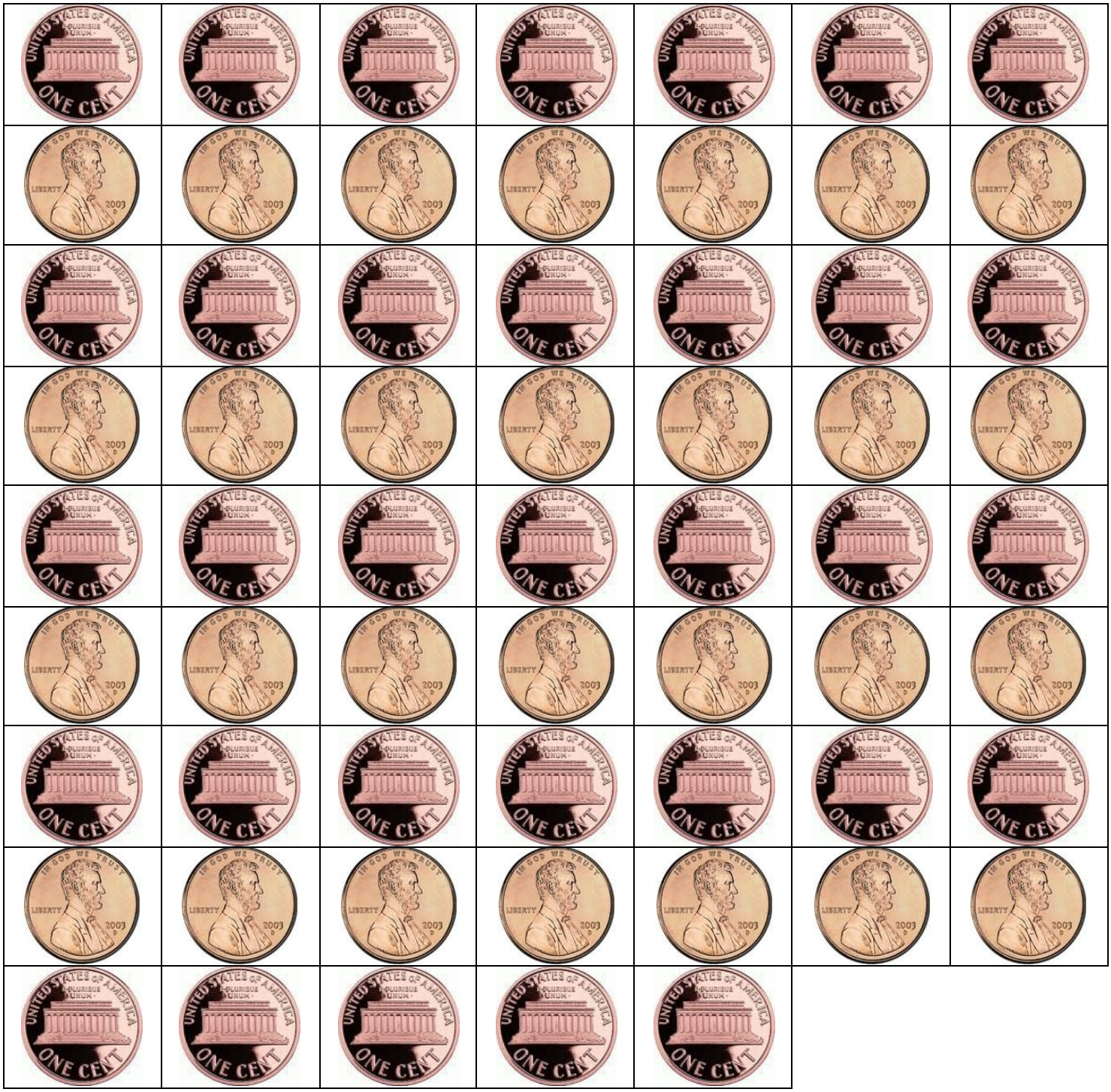
- **What fraction is represented by the green grids?** *(1 $\frac{1}{2}$ or 1 $\frac{5}{10}$ or 1 $\frac{50}{100}$)*
- **Is this fraction greater than one whole? How do you know?** *(yes) Answers may vary. There is more than 1 entire grid colored; etc.*
- **How is that fraction written as a decimal?** *(1.5)*
- **What fraction is represented by the pink grids?** *(1 $\frac{1}{5}$ or 1 $\frac{2}{10}$ or 1 $\frac{20}{100}$)*
- **Is this fraction greater than one whole? How do you know?** *(yes) Answers may vary. There is*

Suggested Day	Suggested Instructional Procedures	Notes for Teacher
	more than 1 entire grid colored; etc. • **How is this written as a decimal?** *(1.2)* • **What fraction is represented by the orange grids?** *(*$\frac{3}{10}$ *or* $\frac{30}{100}$ *)* • **Is this fraction greater than one whole? How do you know?** *(no) Answers may vary. I needed the entire grid colored to make a whole, but only 30 squares or* $\frac{3}{10}$ *of a grid is colored; etc.* 26. Distribute a pair of scissors and glue stick to each student. Instruct students to cut out the colored hundredths grids from their handout: **Combining Necklaces**, glue these grids into their math journal, and label each "color" with the fraction and decimal to represent the amount colored in.	
	Evaluate 1 **Instructional Procedures:** 1. Distribute handout: **Necklace Design**, 100 objects (e.g., beads, pasta, cereal, etc.) of three different colors, and a set of map pencils to each student. 2. Assess individual student understanding using the following Performance Indicator(s). **Performance Indicator(s):** Create a necklace design using 100 objects (e.g., beads, pasta, cereal, etc.) of three different colors. Then use a 100s grid to sort the necklace objects by color and color-in the grid accordingly. Record the following for the colors in the necklace design: (1) the fractions represented for each color; (2) the fraction to decimal equivalence for each color; (3) the name in words for each decimal; (4) the order of the fractions and decimals from greatest to least; (5) one comparison statement for the fractions and one comparison statement for the decimals with appropriate symbols; and (6) create a problem situation involving the colors of the necklace that could be answered using fractional pieces and a written justification of the solution. Copy your colored 100s grid onto three more grids creating a total of four 100s grids. If each 100s grid represents "one whole", find, describe, and record one or more of the colors used in the 100s grid where the fraction and decimal representation is greater than one. (4.2A, 4.2B, 4.2C, 4.2D; 4.14A, 4.14D; 4.15A, 4.15B; 4.16B) ELPS 5B; 1G	**ATTACHMENTS** • Handout: **Necklace Design** (1 per student) **MATERIALS** • beads, pasta, or cereal (3 different colors) (100 pieces per student) • map pencils (1 set per student)

Parts of a Dollar



Parts of a Dollar



Parts of a Dollar – Dimes

Conner bought a cookie and paid for it with 3 dimes. What part of a dollar is 3 dimes? Record the number as a fraction and as a decimal.

(1) Use coins to show parts of a dollar.

=

10 dimes = 1 dollar

1 dime = 1 tenth of a dollar

(2) Record one-tenth as a fraction: $\frac{1}{10}$

Record one-tenth as a decimal: 0.1

One dime equals $\frac{1}{10}$ of a dollar or 0.1 of a dollar.

1 dime out of ten dimes

$\frac{1}{10}$ ← numerator ← denominator

ones tenths

0.1

decimal point

(3) Conner paid with 3 dimes. Use coins to show this part of a dollar. Three dimes equals three-tenths of a dollar.

(4) Conner paid with $\frac{3}{10}$ of a dollar, or 0.3 of a dollar.

Record this dollar amount in words.

three-tenths

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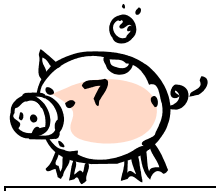
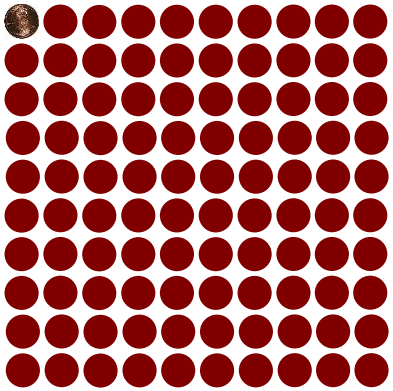
Parts of a Dollar – Pennies



Cheryl put 67 pennies in her piggy bank. What part of a dollar is 67 pennies? Record the number as a fraction and as a decimal.

(1) Use coins to show parts of a dollar.



=

100 pennies = 1 dollar
1 penny = 1 hundredth of a dollar

(2) Record one-hundredth as a fraction: $\frac{1}{100}$

Record one-hundredth as a decimal: 0.01

One penny equals $\frac{1}{100}$ of a dollar or 0.01 of a dollar.

1 penny out of a hundred pennies

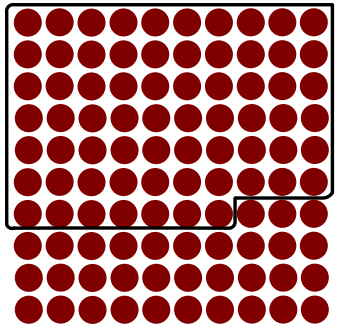
$\frac{1}{100}$ ← numerator ← denominator

ones tenths hundredths

0.01

decimal point

(3) Cheryl put 67 pennies in the bank. Use coins to show this part of a dollar. 67 pennies equals 67 hundredths of a dollar.



(4) Cheryl paid with $\frac{67}{100}$ of a dollar, or 0.67 of a dollar. Record this dollar amount in words.

sixty-seven hundredths

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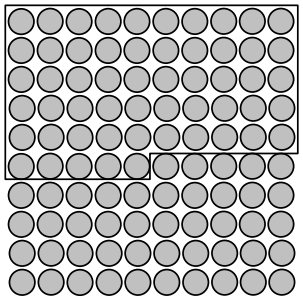
Parts of a Dollar Practice KEY

The bus fare from Jerry's house to the mall is $0.55.

(1) Use your coins to make a sketch below to show the amount of money in the problem.

Sketches may vary –Sample sketch



55 pennies equals $\frac{55}{100}$ of a dollar

(2) Record a fraction that represents this amount of money.

$\frac{55}{100}$

(3) Record a decimal that represents this same amount of money.

0.55

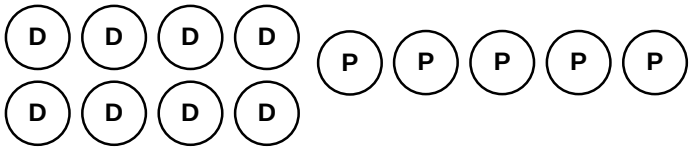
(4) Record the fraction and decimal in words.

fifty-five hundredths

He spent $0.85 on a drink at the food court.

(1) Use your coins to make a sketch below to show the amount of money in the problem.

Sketches may vary –Sample sketch



8 dimes and 5 pennies equals $\frac{85}{100}$ of a dollar

(2) Record a fraction that represents this amount of money.

$\frac{85}{100}$

(3) Record a decimal that represents this same amount of money.

0.85

(4) Record the fraction and decimal in words.

eighty-five hundredths

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Parts of a Dollar Practice

The bus fare from Jerry's house to the mall is $0.55.

(1) Use your coins to make a sketch below to show the amount of money in the problem.	(2) Record a fraction that represents this amount of money.
	(3) Record a decimal that represents this same amount of money.
_____equals _____ of a dollar.	(4) Record the fraction and decimal in words.

He spent $0.85 on a drink at the food court.

(1) Use your coins to make a sketch below to show the amount of money in the problem.	(2) Record a fraction that represents this amount of money.
	(3) Record a decimal that represents this same amount of money.
_____equals _____ of a dollar.	(4) Record the fraction and decimal in words.

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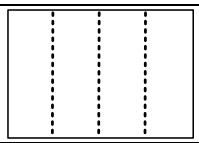
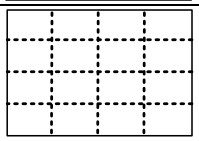
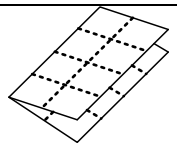
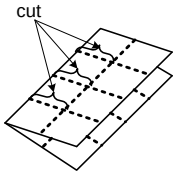
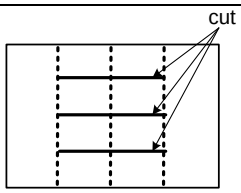
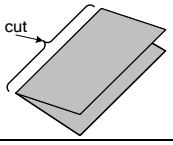
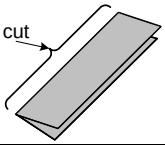
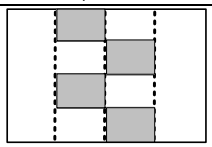
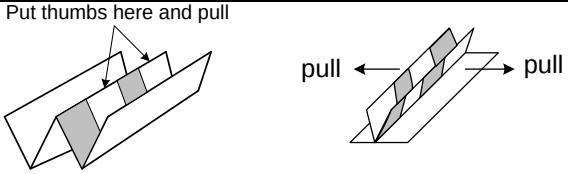
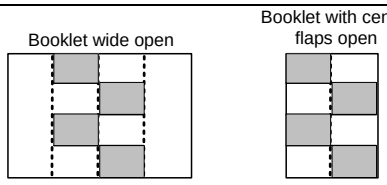
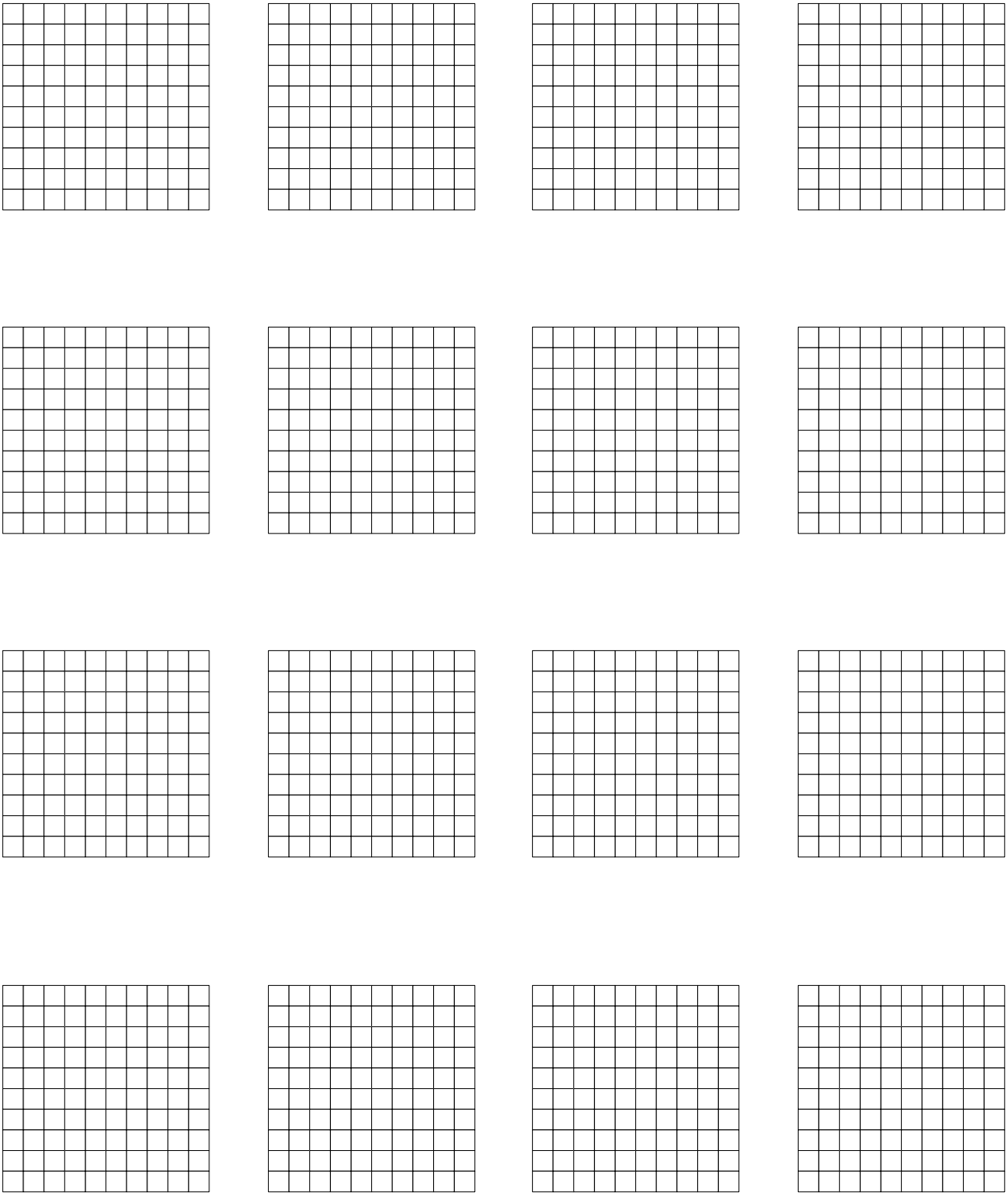
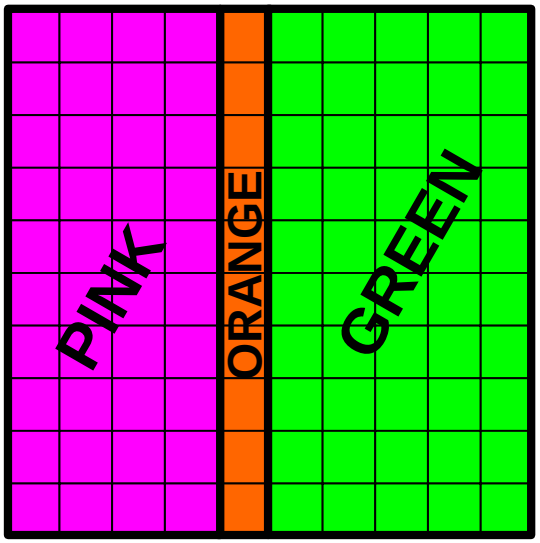
Magic Flip Book Directions

1. Fold a sheet of 9” x 12” construction paper in half as shown. Fold the same sheet of paper again lengthwise.	
2. Open the paper and it should be divided into four equal columns. (See example)	
3. Fold the paper in half twice in the opposite direction and then open the paper back up. (See example)	
4. Fold the paper along the same crease made in step 1.	
5. Cut along each crease beginning at the center fold right up to the first crease in the next column. Do this for all three creases to form 4 sections. Make sure the lines do not connect with any other cuts or go past the crease.	
6. Open the paper completely. The inner two columns should be the only ones cut.	
7. Take another sheet of construction paper of a different color, fold it, and cut it in half. Set aside one of the pieces.	
8. Fold the other piece lengthwise and cut along the fold to create two “columns.”	
9. Take one of these pieces and weave it through the slits in the middle of the whole sheet you prepared in steps 1-7. Repeat with the second strip.	
10. Fold the booklet closed along the creases (into a “W”) and then pull on the center flaps to open the center of the booklet.	
11. The booklet is “magic” when you can fold and unfold the booklet revealing the “magic” flip section. Anything written in this section of the book is hidden when the book is extended out flat.	

Mini 100s Grids



Cereal Necklaces Recording Sheets KEY

Necklace #1	Grid
$\frac{2}{5}$ = pink $\frac{1}{2}$ = green $\frac{1}{10}$ = orange	*Sketches may vary* *Sample* 

Fraction → Decimal

pink = $\frac{2}{5}$ = *0.4*

green = $\frac{1}{2}$ = *0.5*

orange = $\frac{1}{10}$ = *0.1*

Record the decimal(s) in words.

four-tenths
five-tenths
one-tenth

Order fractions and decimals from greatest to least and compare.

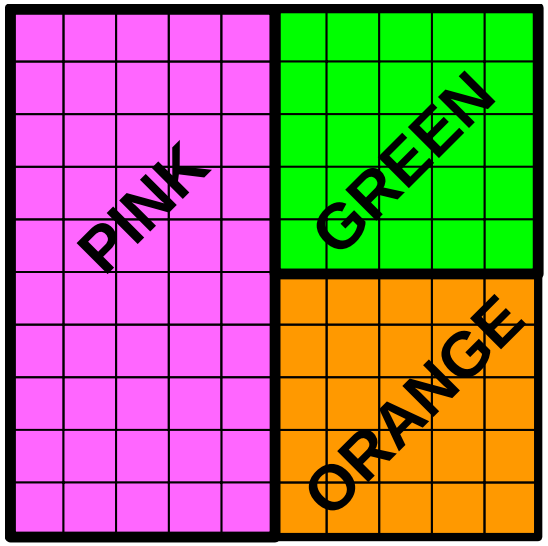
$\frac{1}{2} > \frac{2}{5} > \frac{1}{10}$

0.5 > 0.4 > 0.1

Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Answers may vary

Cereal Necklaces Recording Sheets KEY

Necklace #2	Grid
$\frac{1}{2}$ = pink $\frac{1}{4}$ = green $\frac{1}{4}$ = orange	*Sketches may vary* *Sample* 

Fraction → Decimal

pink = $\frac{1}{2}$ = *0.5*

green = $\frac{1}{4}$ = *0.25*

orange = $\frac{1}{4}$ = *0.25*

Record the decimal(s) in words.

five-tenths
twenty-five hundredths

Order fractions and decimals from greatest to least and compare.

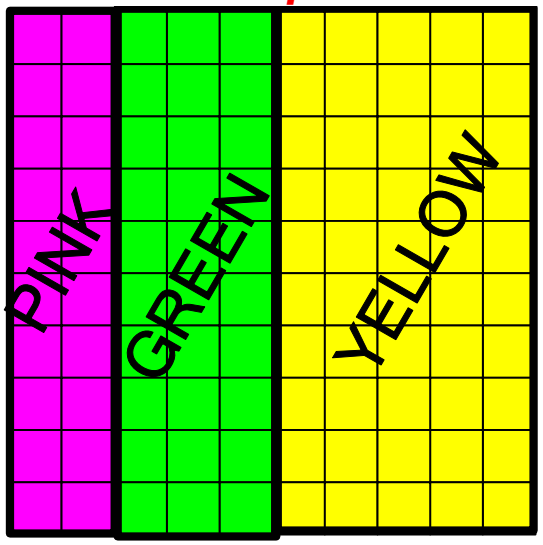
$\frac{1}{2}$ > $\frac{1}{4}$ = $\frac{1}{4}$

0.5 > 0.25 = 0.25

Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Answers may vary

Cereal Necklaces Recording Sheets KEY

Necklace #3	Grid
$\frac{1}{5}$ = pink $\frac{1}{2}$ = yellow $\frac{3}{10}$ = green	*Sketches may vary* *Sample* 

Fraction → Decimal

pink = $\frac{1}{5}$ = *0.2*

yellow = $\frac{1}{2}$ = *0.5*

green = $\frac{3}{10}$ = *0.3*

Record the decimal(s) in words.

two-tenths
five-tenths
three-tenths

Order fractions and decimals from greatest to least and compare.

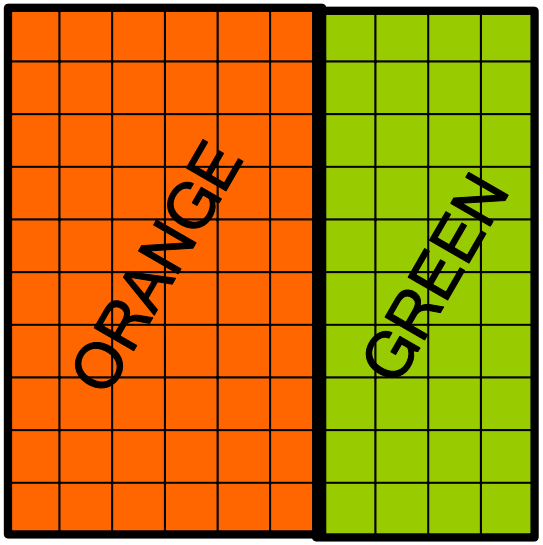
$\frac{1}{2} > \frac{3}{10} > \frac{1}{5}$

0.5 _____ 0.3 _____ 0.2

Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Answers may vary

Cereal Necklaces Recording Sheets KEY

Necklace #4	Grid
$\frac{3}{5}$ = orange $\frac{2}{5}$ = green	*Sketches may vary* *Sample* 

Fraction → Decimal

orange = $\frac{3}{5}$ = *0.6*

green = $\frac{2}{5}$ = *0.4*

Write the decimal(s) in words.

six-tenths
four-tenths

Record fractions and decimals from greatest to least and compare.

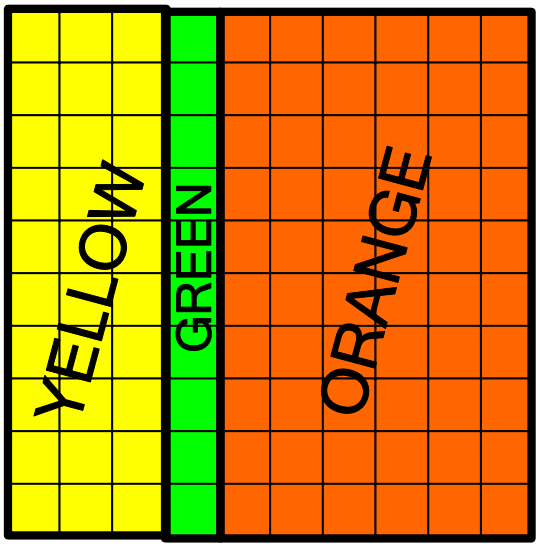
$\frac{3}{5} > \frac{2}{5}$

0.6 > *0.4*

Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Answers may vary

Cereal Necklaces Recording Sheets KEY

Necklace #5	Grid
$\frac{3}{10}$ = yellow $\frac{1}{10}$ = green $\frac{3}{5}$ = orange	*Sketches may vary* *Sample* 

Fraction → Decimal

yellow = $\frac{3}{10}$ = *0.3*

green = $\frac{1}{10}$ = *0.1*

orange = $\frac{3}{5}$ = *0.6*

Record the decimal(s) in words.

three-tenths
one-tenth
six-tenths

Order fractions and decimals from greatest to least and compare.

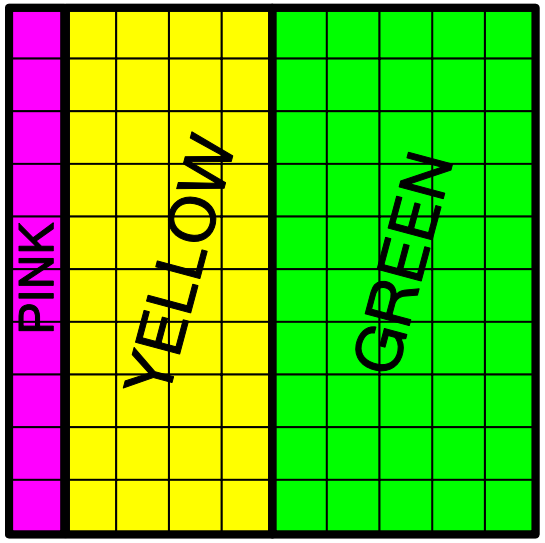
$\frac{3}{5} > \frac{3}{10} > \frac{1}{10}$

0.6 > 0.3 > 0.1

Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Answers may vary

Cereal Necklaces Recording Sheets KEY

Necklace #6	Grid
$\frac{1}{10}$ = pink $\frac{1}{2}$ = green $\frac{2}{5}$ = yellow	*Sketches may vary* *Sample* 

Fraction → Decimal
pink = $\frac{1}{10}$ = *0.1* green = $\frac{1}{2}$ = *0.5* yellow = $\frac{2}{5}$ = *0.4*
Record the decimal(s) in words.
one-tenth *five-tenths* *four-tenths*
Order fractions and decimals from greatest to least and compare.
$\frac{1}{2} > \frac{2}{5} > \frac{1}{10}$
0.5 > 0.4 > 0.1

Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Answers may vary

Cereal Necklaces Recording Sheets KEY

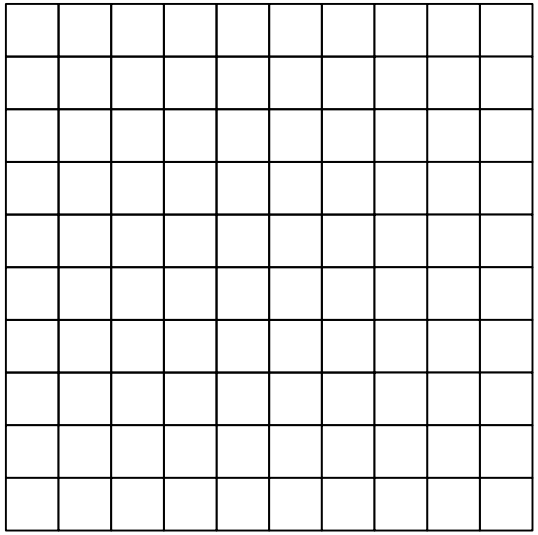
Describe how you can compare and order a set of fractions with the same denominator.

Fractions with the same denominator, or parts of the same size, can be compared and ordered by examining the numerators. When fractions have the same denominator, the fraction with the greater numerator is the larger fraction because it has more same-size parts.

Describe how you can compare and order a set of fractions with the same numerator.

Fractions with the same numerator can be compared and ordered by examining the denominators. When fractions have the same numerator, the fraction with the larger denominator is the smaller fraction because it has smaller same-size parts.

Cereal Necklaces Recording Sheets

Necklace #1	Grid
$\frac{2}{5}$ = pink $\frac{1}{2}$ = green $\frac{1}{10}$ = orange	

Fraction → Decimal

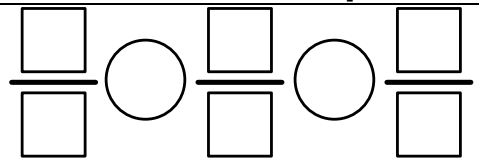
pink = $\frac{2}{5}$ = ☐

green = $\frac{1}{2}$ = ☐

orange = $\frac{1}{10}$ = ☐

Record the decimal(s) in words.

Order fractions and decimals from greatest to least and compare.



Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

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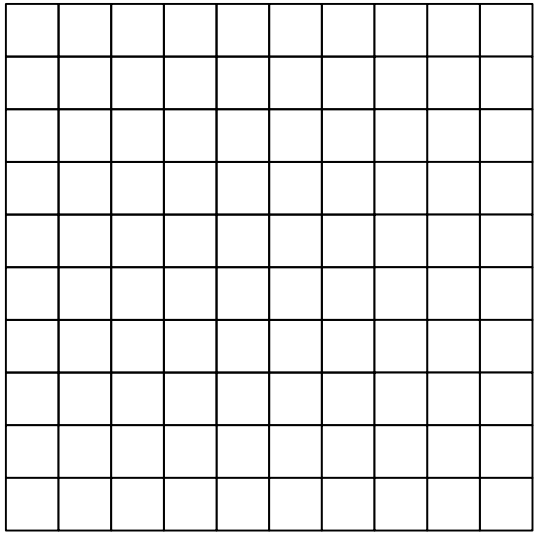
Cereal Necklaces Recording Sheets

Necklace #2	Grid
$\frac{1}{2}$ = pink $\frac{1}{4}$ = green $\frac{1}{4}$ = orange	

Fraction → Decimal

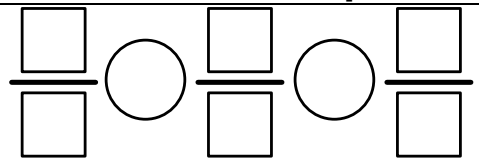
pink = $\frac{1}{2}$ = ☐

green = $\frac{1}{4}$ = ☐

orange = $\frac{1}{4}$ = ☐

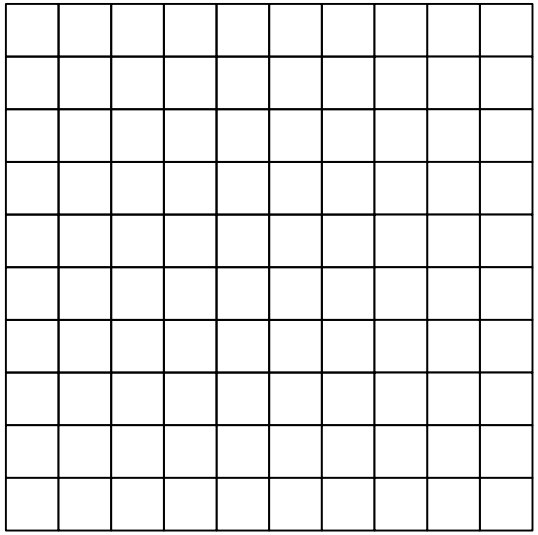
Record the decimal(s) in words.

Order fractions and decimals from greatest to least and compare.



Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Cereal Necklaces Recording Sheets

Necklace #3	Grid
$\frac{1}{5}$ = pink $\frac{1}{2}$ = yellow $\frac{3}{10}$ = green	

Fraction → Decimal

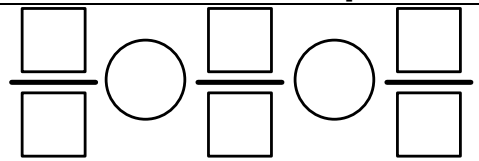
pink = $\frac{1}{5}$ = ☐

yellow = $\frac{1}{2}$ = ☐

green = $\frac{3}{10}$ = ☐

Record the decimal(s) in words.

Order fractions and decimals from greatest to least and compare.



Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

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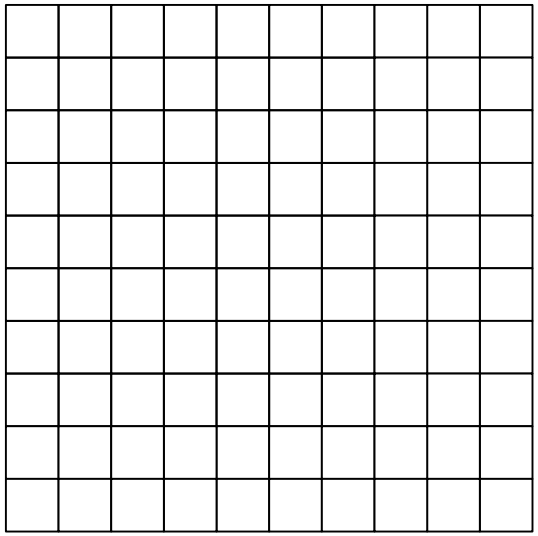
Cereal Necklaces Recording Sheets

Necklace #4	Grid
$\frac{3}{5}$ = orange $\frac{2}{5}$ = green	

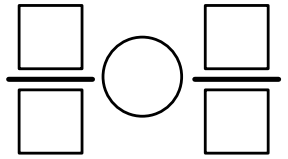
Fraction → Decimal

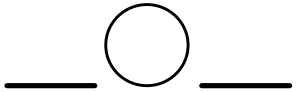
orange = $\frac{3}{5}$ = ☐

green = $\frac{2}{5}$ = ☐

Record the decimal(s) in words.

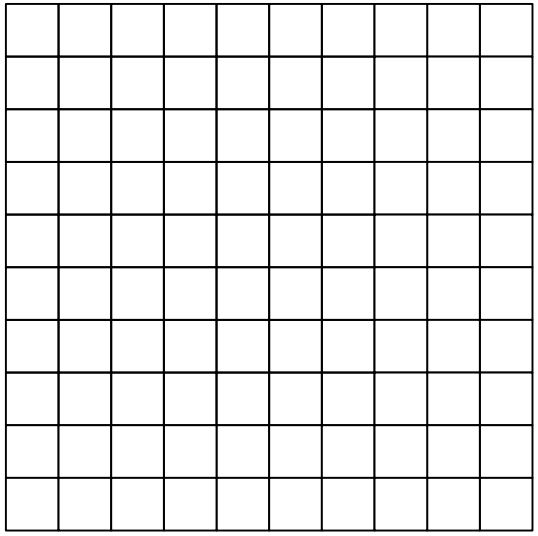
Order fractions and decimals from greatest to least and compare.





Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Cereal Necklaces Recording Sheets

Necklace #5	Grid
$\frac{3}{10}$ = yellow $\frac{1}{10}$ = green $\frac{3}{5}$ = orange	

Fraction → Decimal

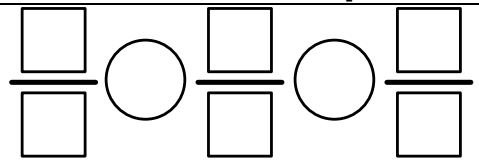
yellow = $\frac{3}{10}$ = ☐

green = $\frac{1}{10}$ = ☐

orange = $\frac{3}{5}$ = ☐

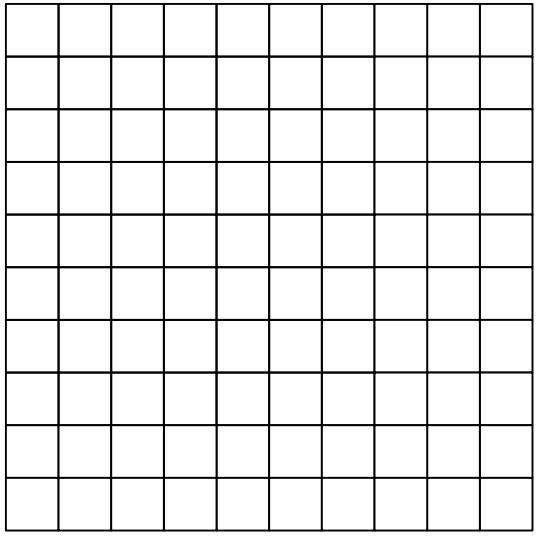
Record the decimal(s) in words.

Order fractions and decimals from greatest to least and compare.



Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Cereal Necklaces Recording Sheets

Necklace #6	Grid
$\frac{1}{10}$ = pink $\frac{1}{2}$ = green $\frac{2}{5}$ = yellow	

Fraction → Decimal

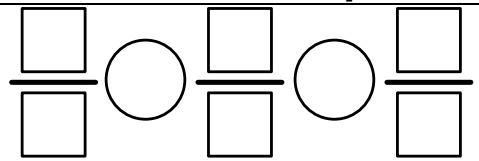
pink = $\frac{1}{10}$ = ☐

green = $\frac{1}{2}$ = ☐

yellow = $\frac{2}{5}$ = ☐

Record the decimal(s) in words.

Order fractions and decimals from greatest to least and compare.



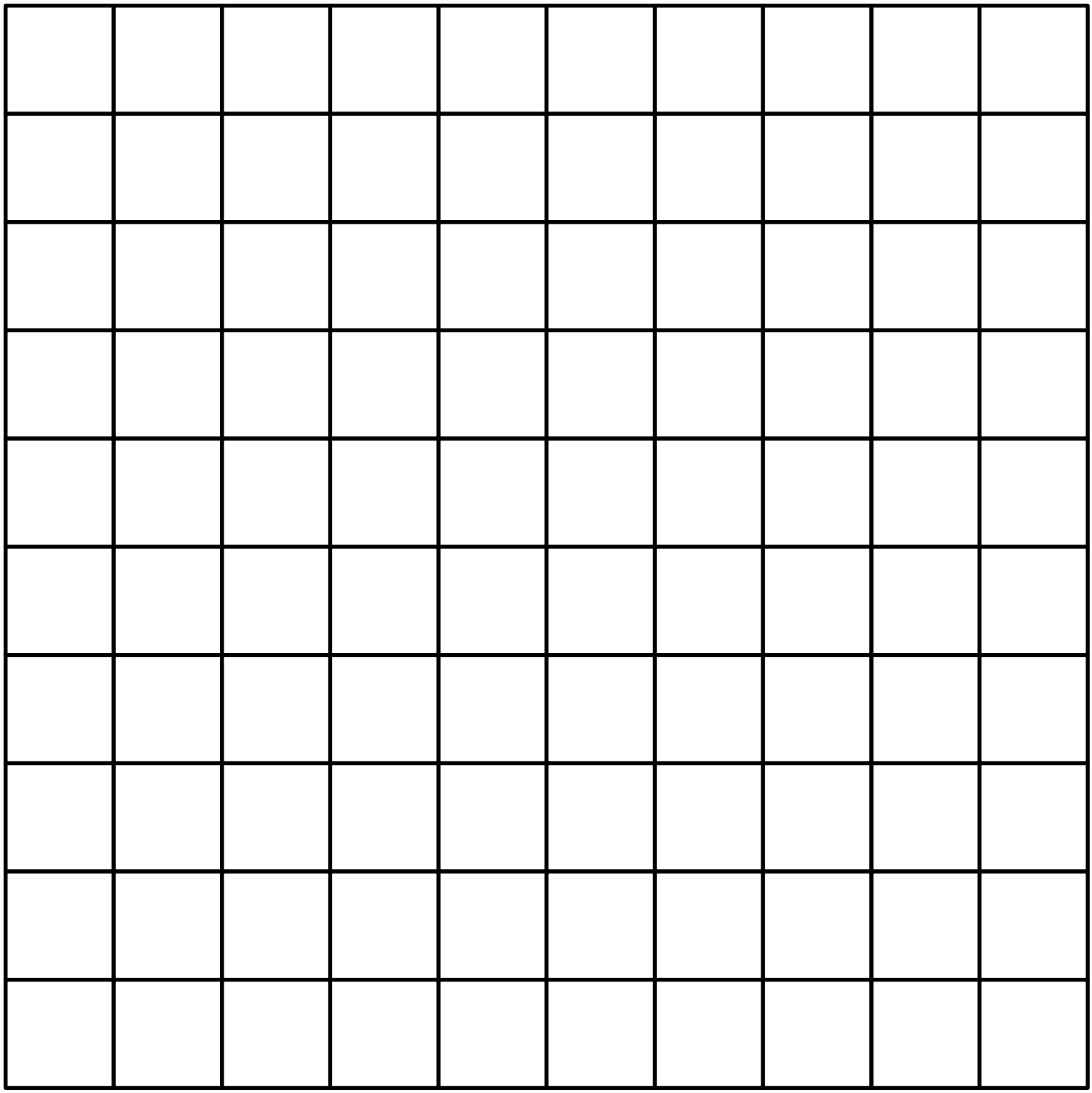
Create a problem that could be answered using the fractional pieces of this necklace. Solve the problem.

Cereal Necklaces Recording Sheets

Describe how you can compare and order a set of fractions with the same denominator.

Describe how you can compare and order a set of fractions with the same numerator.

100s Grid



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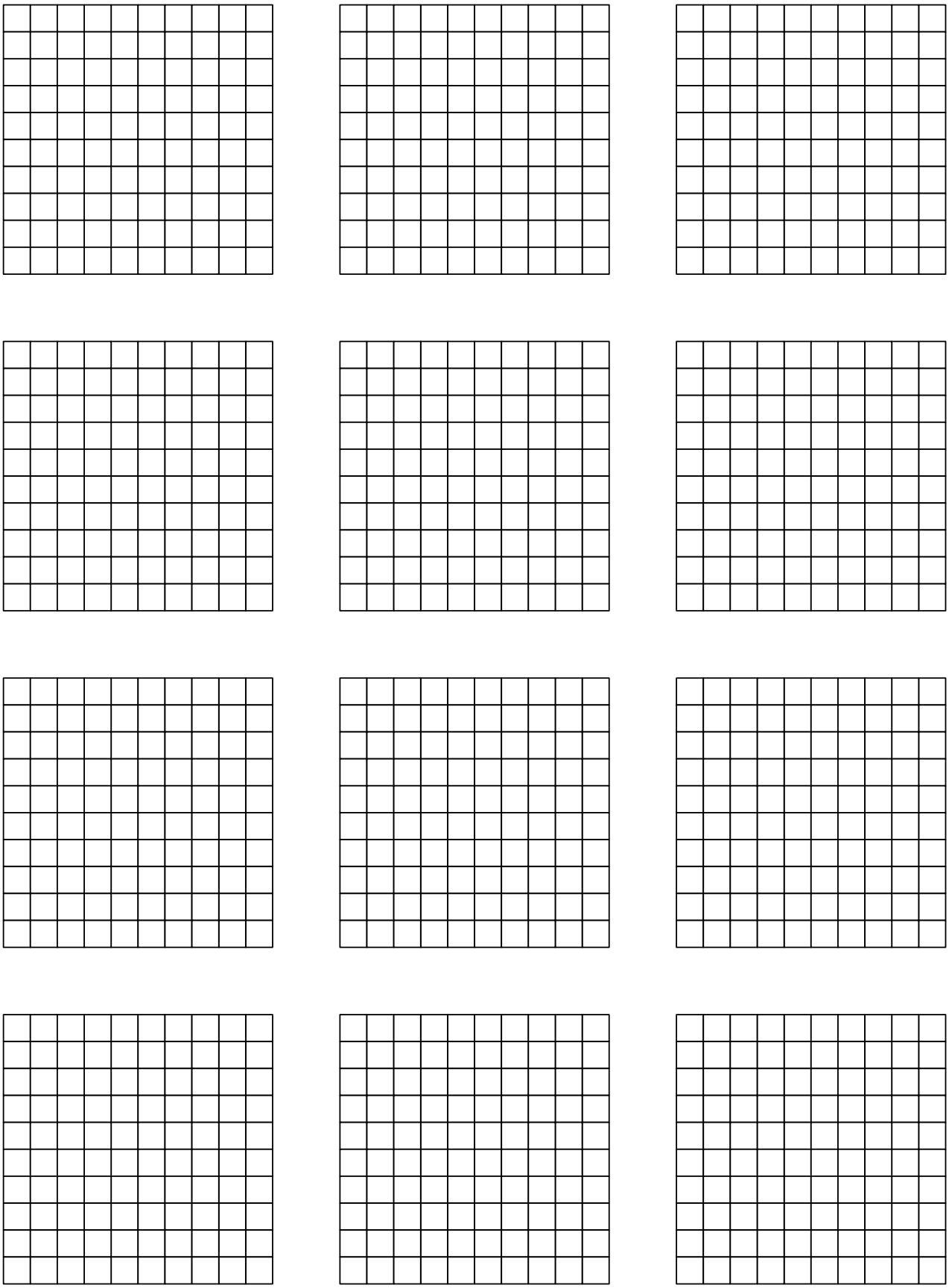
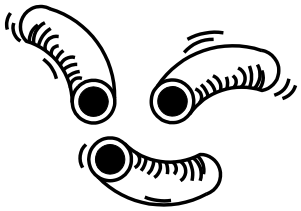
Combining Necklaces





Basic Recipe to Dye Pasta

- $\frac{1}{8}$ cup rubbing alcohol
- 1 tablespoon food coloring
- 2 cups pasta
- 1 quart plastic bag

1. Pour alcohol and food coloring in bag and mix together.
2. Add pasta to bag and mix all together until you get the shade you want.
3. Pour out onto newspaper to dry.
4. If not dark enough, repeat process.

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Necklace Design