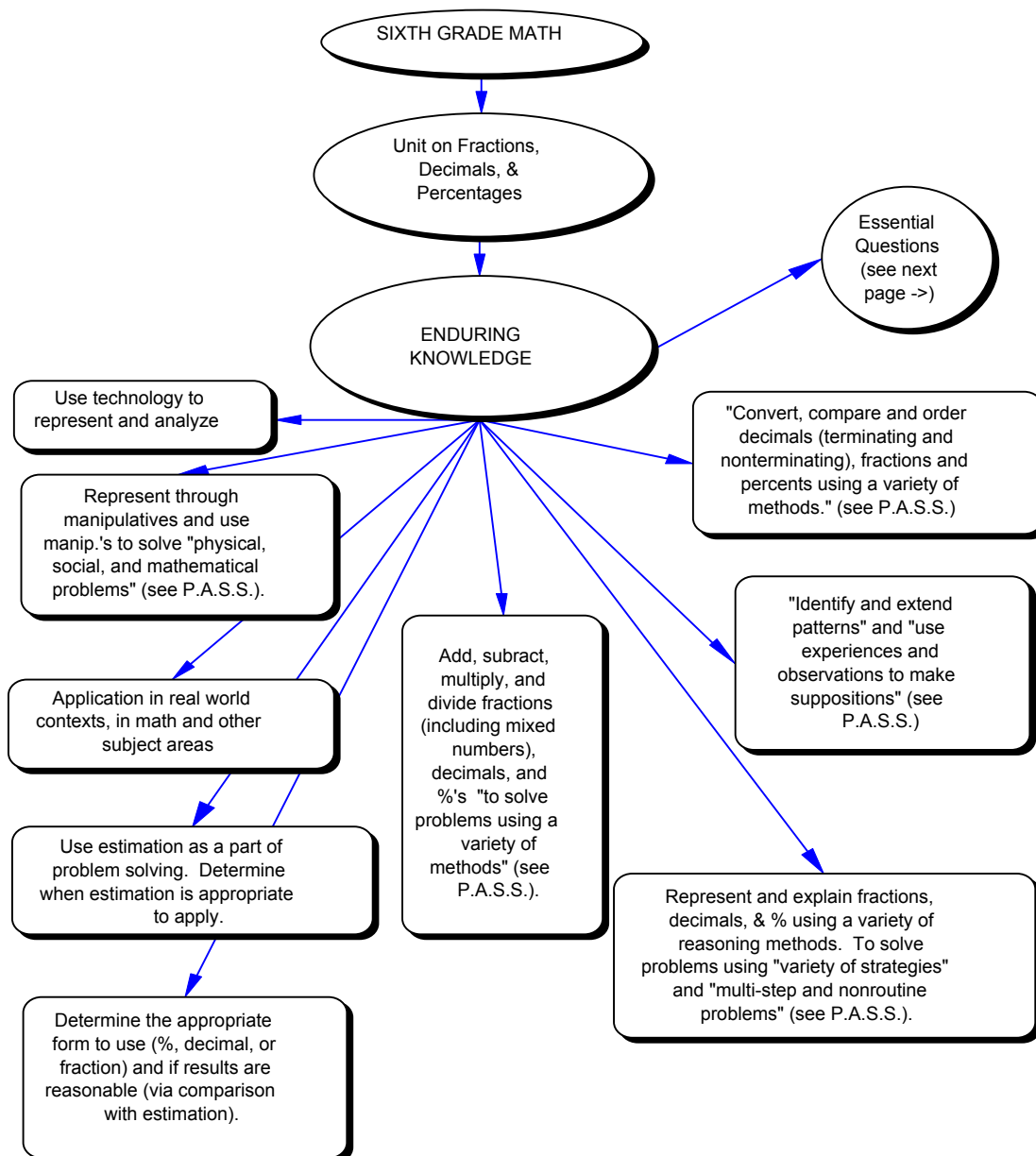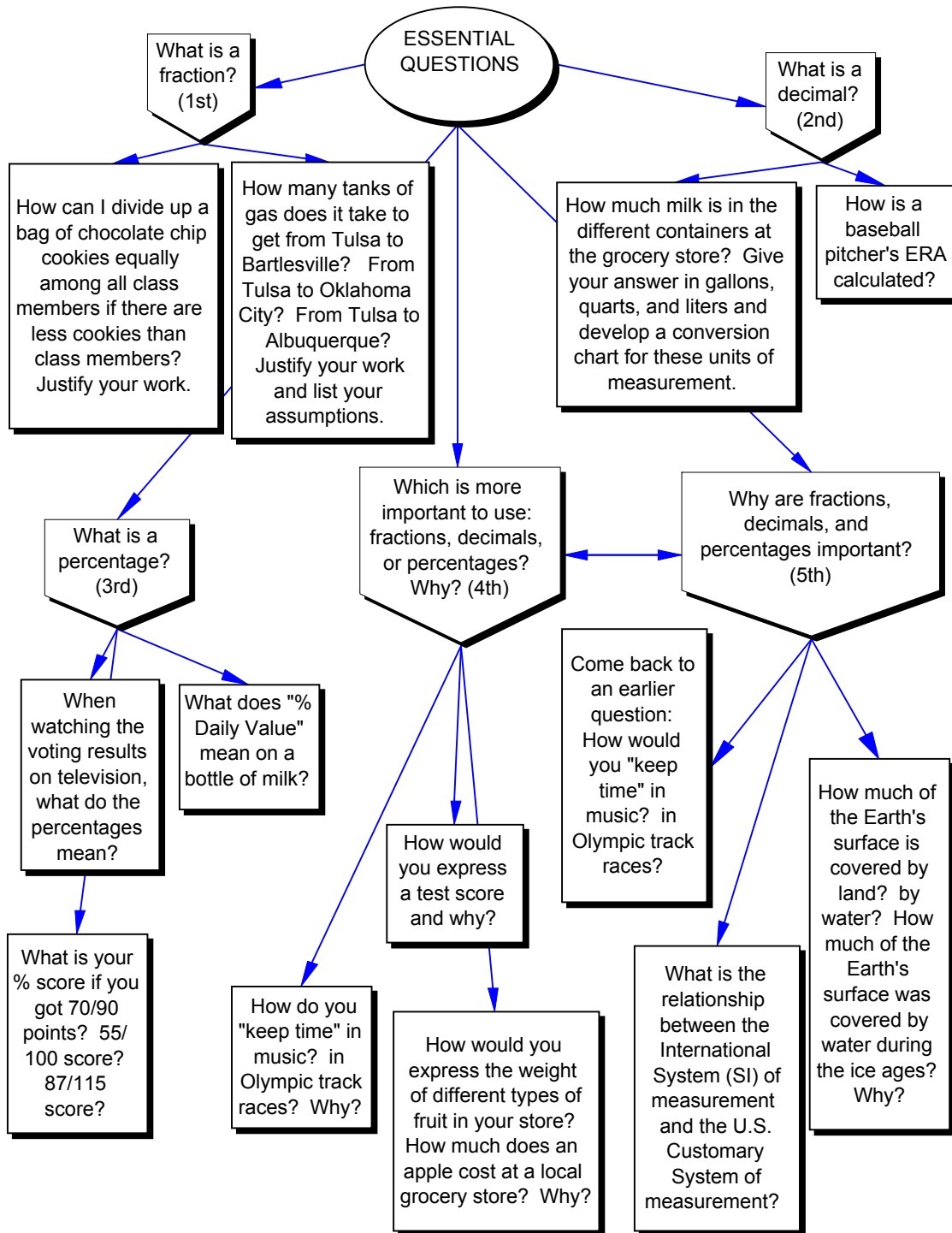**STORYLINE FOR A UNIT
ON FRACTIONS, DECIMALS, AND PERCENTAGES
FOR A 6$^{\text{TH}}$ GRADE MATH CLASS
CREATED BY LAURA STRUM
(~9 WEEK UNIT)**

SUMMARY OF THE UNIT:

This unit is the result of an assigned project from an education course. The project was to develop a curriculum based on standards, essential questions, and unit questions. The standards can be incorporated into the "enduring knowledge" that the teacher wishes to have in this unit. This unit incorporates some of the Oklahoma Priority Academic Student Skills for sixth grade math relating to fractions, decimals, and percentages. This unit incorporates or has the flexibility to allow the teacher to incorporate the NCTM Mathematics Process Standards for Grades 6 – 8 posted with the Oklahoma P.A.S.S. These standards and P.A.S.S. that were used were obtained from the website, http://www.sde.state.ok.us/home/home01_test.html?http://sde.state.ok.us/publ/pass.html!. The concept map below contains some of these standards.

SIXTH GRADE MATH

Unit on Fractions, Decimals, & Percentages

Essential Questions (see next page ->)

ENDURING KNOWLEDGE

Use technology to represent and analyze

"Convert, compare and order decimals (terminating and nonterminating), fractions and percents using a variety of methods." (see P.A.S.S.)

Represent through manipulatives and use manip.'s to solve "physical, social, and mathematical problems" (see P.A.S.S.).

"Identify and extend patterns" and "use experiences and observations to make suppositions" (see P.A.S.S.)

Application in real world contexts, in math and other subject areas

Add, subtract, multiply, and divide fractions (including mixed numbers), decimals, and %'s "to solve problems using a variety of methods" (see P.A.S.S.).

Use estimation as a part of problem solving. Determine when estimation is appropriate to apply.

Represent and explain fractions, decimals, & % using a variety of reasoning methods. To solve problems using "variety of strategies" and "multi-step and nonroutine problems" (see P.A.S.S.).

Determine the appropriate form to use (%, decimal, or fraction) and if results are reasonable (via comparison with estimation).

The unit was based on five essential questions. These essential questions and some unit questions (connected to the essential questions) are shown in the concept map below.

ESSENTIAL QUESTIONS

What is a fraction? (1st)

What is a decimal? (2nd)

How can I divide up a bag of chocolate chip cookies equally among all class members if there are less cookies than class members? Justify your work.

How many tanks of gas does it take to get from Tulsa to Bartlesville? From Tulsa to Oklahoma City? From Tulsa to Albuquerque? Justify your work and list your assumptions.

How much milk is in the different containers at the grocery store? Give your answer in gallons, quarts, and liters and develop a conversion chart for these units of measurement.

How is a baseball pitcher's ERA calculated?

What is a percentage? (3rd)

Which is more important to use: fractions, decimals, or percentages? Why? (4th)

Why are fractions, decimals, and percentages important? (5th)

When watching the voting results on television, what do the percentages mean?

What does "% Daily Value" mean on a bottle of milk?

Come back to an earlier question: How would you "keep time" in music? in Olympic track races?

How much of the Earth's surface is covered by land? by water? How much of the Earth's surface was covered by water during the ice ages? Why?

How would you express a test score and why?

What is your % score if you got 70/90 points? 55/100 score? 87/115 score?

How do you "keep time" in music? in Olympic track races? Why?

How would you express the weight of different types of fruit in your store? How much does an apple cost at a local grocery store? Why?

What is the relationship between the International System (SI) of measurement and the U.S. Customary System of measurement?

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CURRICULAR PRIORITIES

Grade Level: Sixth Grade (Middle School)
Subjects: Mathematics. I will incorporate Earth Science, Social Studies, and English Writing as well.
Unit Topics: Fractions, Decimals, and Percentages
Standards being Incorporated: Oklahoma Priority Academic Student Skills (P.A.S.S.)

CURRICULAR PRIORITIES/GOALS (including some Oklahoma P.A.S.S.)

1) To use technology to represent and analyze computations involving fractions, decimals, and percents. This would include the use of computers.

2) To apply fractions, decimals, and percents in real world contexts, other math areas, and other subject areas. This can be accomplished within lecture, media, and via group tasks. This can also be done with word problems (including open-ended problems).

3) To represent fractions, decimals, and percents via the student's own created manipulatives as well as manipulatives and other representation forms presented by the teacher. This requires student presentations. The manipulatives can be used to represent and solve "physical, social, and mathematical problems" (P.A.S.S. pg. 154). They can be created for specific problems as well.

4) To determine whether the use of fractions, decimals, or percentages is appropriate in various situations. To determine if the results are reasonable (Oklahoma P.A.S.S. pg. 153). This would involve word problems (including open-ended problems) and in-class debates about the appropriateness of each type of representation.

5) To apply estimation to various situations involving whole numbers, fractions, decimals, and percentages. This would also involve word problems. To determine "whether solutions are reasonable." (P.A.S.S. pg. 155)

6) To "identify and extend patterns" and "use experiences and observations to make suppositions" (P.A.S.S. pg. 154).

7) To "convert, compare and order decimals (terminating and nonterminating), fractions and percents using a variety of methods." (P.A.S.S. pg. 155)

8) To add, subtract, multiply, and divide fractions, decimals, and percentages "to solve problems using a variety of methods (e.g., use fraction strips, find the least common denominator [LCD])." (P.A.S.S. pg. 155) Such problems should include multi-step and non-routine problems.

These curricular priorities are the enduring knowledge and goals that the teacher should incorporate when teaching the storyline in this unit. The storyline may not literally state

activities and topics that satisfy the standards and priorities, but the storyline should have the flexibility to allow for such incorporation.

Along with the development of essential questions, unit questions, priorities, choosing and incorporating of standards, and storyline, the assignment required the development of a final assessment. This assessment should let the teacher know if the individual students have gained the sought-after understandings from the unit. The final assessment is given after the storyline. The assessment includes rubrics for each part.

SUMMARY OF THE STORYLINE:

WHAT IS A FRACTION?
Topics: Numerator and Denominator
        LCD (lowest common denominator)
        Compound Fractions (a.k.a. Mixed Numbers)
        Fraction comparisons (including mixed numbers)
        -equivalent fractions
        -greater than, less than comparisons
        Negative Fractions
        Fraction Addition and Subtraction
        Estimation (to single and multi-step problems)
        Fraction Multiplication and Division (including complex fractions)
Projects: Articles/Advertisements, Base 10 blocks, Cuisenaire Rods and Blocks, Fraction Tower Cubes (see Cuisenaire website at www.etacuisenaire.com), Fraction Strips, computer time with www.arcytech.org/java/patterns program (fractions and shapes), make a KWL (what you know, what you want to know, and what you've learned) chart, etc.
Quiz

WHAT IS A DECIMAL?
Topics: Review of place value system (going out to 10,000th place)
        Relation of fractions with decimals
        Decimal and Fraction Comparisons (greater than, less than)
        Decimal Addition and Subtraction (including negative decimals)
        Decimal Estimation (to single and multi-step problems)
        Decimal Multiplication and Division
Projects: Articles/Advertisements, Cuisenaire Rods/Blocks, Decimal Tower Cubes (see Cuisenaire website), Grocery Store Field Trip, Classroom dimensions/conversion of measuring units, use money manipulatives.
Quiz

WHAT IS A PERCENTAGE?
Topics: Relationship of percentages to decimals and fractions (converting between the different forms)
        Percentage, Decimal, and Fraction comparison (greater than, less than)
        Adding and subtracting percentages (including negative percentages and those greater than 100%)

Estimation (to single and multi-step problems)

Multiplying and dividing percentages

Projects: Articles/Advertisements, Cuisenaire Rods/Blocks, Percent Tower Cubes (see Cuisenaire website), Microsoft Excel Pie Charts.

Quiz

WHICH IS MORE IMPORTANT TO USE?

Topics: Relating between fractions, decimals, and percentages

Appropriateness of using one form of an answer over another.

Projects: Have students make lemonade using ingredients in decimal form, % form, and fraction form, Group Debates over which is more important (to begin this session), Homework: Worksheets, self-created word problems, textbook assignments, etc.

WHY ARE FRACTIONS, DECIMALS, AND PERCENTAGES IMPORTANT?

Topics: to discover how and why fractions, decimals, and percentages are important in other school subjects as well as out in the "real world".

Projects: Real world applications--reiterate clippings from previous assignments and create a bulletin board of applications, have a few speakers come in to talk about the importance of math (in particular the use of fractions, decimals, and percentages in their jobs), Dewey Decimal System project, census data project, one page paper toward beginning of unit compared with one-page paper at end of unit about importance of fractions, decimals, and percentages, and analyze the rain and temperature data that was collected throughout the unit—including discussion on the importance of such data.

Final Asssessment Projects

Final Test

NOTE: For identification purposes in this storyline, Homeworks are labeled H#, Worksheets are labeled W#, self-assessment papers P#, and the article/advertisement assignments are labeled C#.

ASSUMPTIONS: This unit should be taught after a unit on addition, subtraction, multiplication, and division with positive and negative integers, including the solving of word problems.

SPECIAL NOTE 1: It is considered important in this unit to always bring closure to each class period/day and to always bring closure to the week. It is not specifically stated throughout the storyline due to the fact that some topics and mini-lessons will not fit within a one-period or one-day time span. Therefore the time to bring closure is left up to the teacher to interject into the storyline when appropriate.

SPECIAL NOTE 2: The purpose of taking up the homework and worksheets is to assess: 1) the extent each individual is completing the homework/worksheet, and 2) if the answers are correct. A pattern of incorrect answers may alert the teacher to incorrect methods of problem solving. If most of the answers are incorrect on a particular topic or method, then that individual needs further help in understanding or needs more practice

with that topic or method. The teacher can determine if it is only the individual who needs the assistance, if a group of individuals need assistance, or if the class as a whole should get the assistance (i.e. more teaching, learning, and practice on the topic or method). The individuals or class may benefit from another teaching method being used for that particular topic.

It is up to the teacher to determine the point value (if any) of each assignment. I recommend that students at least receive credit for turning in their homework on time and receive credit in proportion with the amount of the assignment completed correctly (a simple rubric = perhaps 5 points for turning in the assignment, 1 point for each correct answer provided the work is shown, and 0.5 point for each incorrect answer provided the work is shown).

It is also up to the teacher to return the homework to the students in a timely manner (within 2 days of receiving the homework from the students if possible). This allows the students to have time to study their homework and ask questions regarding their homework while the topic is still fresh on their minds. It is not explicitly stated in this storyline when to return graded homework to the students.

SPECIAL NOTE 3: It is strongly advised within this unit that the teacher never move on to the next topic if the class has not mastered the current or previous topics. It is not always formally stated in this unit for the teacher to determine whether the class is ready to move on to the next topic. This determination should be based on student questions, homework assessments, quiz grades, and informal assessments of in-class performance and discussions (both individual and group).

SPECIAL NOTE 4: I recommend in this unit to have a shoebox and index cards available for students to use to submit their questions anonymously. It is up to the teacher to check the questions from this box daily and to go over the questions and their answers in class when the teacher feels it's necessary. It is stated to check for such shoebox questions in a few places in this storyline. The teacher should check more often however.

SPECIAL NOTE 5: Students should be given the opportunity to revise their graded work. This includes homework, quizzes, and worksheets. To encourage such revising/correction work from the student, the teacher may wish to withhold credit for that particular work until all revisions have been made.

SPECIAL NOTE 6: Students should be given several opportunities for self-assessment and reflection on the goals of the unit. The students should do KWL charts (charts that list what you know, what you want to know, and what you've learned) in order to organize their goals. The teacher should bring attention to the essential questions (e.g. What is a fraction?) throughout the unit as well since the answering of these questions helps bring focus to the goals of the unit. This unit includes assignments in which the students are to write a self-assessment paper.

SPECIAL NOTE 7: The final assessment project parts need to be introduced and completed within this storyline frame. It is up to the teacher to determine the best day to

have students turn in the parts of their assignment. See Final Assessment sheets for details on their final assessment project.

Spend one and a half class days discussing their final assessment project—pass out handouts, include examples of proper citation, qualities of a persuasive paragraph, points and tips on interviewing, and have two mock interviews in class-maybe collaborate with their English teacher on writing persuasively, writing essays, writing thank you cards, interviewing, and phone etiquette. Interviews should be turned in for approval prior to their actual interviews.

During the final weeks of this unit, have the students finish out their big project. Use the final project to wrap up the unit and to gain a good assessment of the students' understandings of the big points of this unit.

STORYLINE

INTRODUCTION DAY! Introduction of the unit. Pass out index cards. On one side have the students tell how comfortable they feel in using fractions, decimals, and percentages. On the other side to write their name and a couple of careers they're thinking about going into and two hobbies they currently have (try to incorporate the careers and hobbies into the math problems throughout the unit). Introduce the unit. Point out the essential questions on the bulletin board. Create a KWL chart on the board. This is a chart that will list what the class knows (about fractions, decimals, and percentages), what the class wants to know (what we want to learn—also refer to essential questions), and what the class has learned (thus far nothing in this class). Let the students know about the question box (a shoebox on my desk where students may drop in their anonymous math questions written on index cards). Make sure to go over questions from this box throughout the unit when necessary. (The teacher needs to begin work on setting up the grocery store field trip – see decimal section).

Begin rain gauge and temperature tracking project. A rain gauge and thermometer will be mounted outside the classroom window. Each day a different student will be responsible for recording the amount of water in the rain gauge (and emptying it out) and recording the temperature. Weekend amounts and temperatures will be estimated using other sources (National Weather Service data, Local News reports, etc.). The data will be analyzed and studied in the section, "Why are fractions, decimals, and percentages important?".

Key Point: Why are fractions, decimals, and percentages important?
Tasks: Have the Key Point question on the board (anticipatory set) and have the class gather into groups to discuss this question. Have the groups present their answers as part of the class discussion on the importance of fractions, decimals, and percentages. Show them examples of newspaper and magazine articles and read aloud sample radio and

billboard advertisements that use fractions, decimals, and percentages. Discuss some of the careers that will use fractions, decimals, or percentages. Discuss how they can be found in product labels (ingredients for e.g.). Hand out a sheet that describes their assignments for gathering articles/advertisements throughout the unit. Then hand out some sheets that contain their final assessment project description and rubric. On one of those sheets have the dates in BOLD and tell the class that the assignments are due on those dates unless they receive a new handout stating otherwise.

Homework (H1): Have the class write a one-page paper on how decimals, fractions, and percentages are important. The paper should include examples of how they are used or appear in their homes. The paper should be turned in the next day.

WHAT IS A FRACTION?

Key Point: What is a fraction?
Significant Points: What are the parts of a fraction? What does "fraction of" mean?

Tasks: Have the students turn in their papers (H1). Have the question: "What is a fraction?" in big letters on the board (Anticipatory set). Ask the class to pair off into groups of three. Then have the groups answer the question: "What is a fraction?". Then have the groups present their answers – while they're presenting their answers ask the class to write down the important points they hear. After the presentations are done, prompt individuals to give you important points. As the important points are spoken, you'll write them down on the board/overhead projector. Then hand out a worksheet (W1) to each student in the groups and have them work on this sheet for homework (individual practice). The worksheet will review numerator, denominator, and how to find the lowest common denominator. The worksheet will also contain identification and problem solving questions and problems concerning numerator, denominator, and lowest common denominator.

Key Point: More on "what is a fraction?"
Significant Points: What is a mixed number? How do I simplify a fraction? What is the lowest common denominator (LCD)?

Tasks: Have some problems from today's worksheet (W1) on the board (Anticipatory set). Have the students turn in their worksheets (W1) assigned yesterday. Go over the answers to the worksheet and assess by show of hands and questions asked if the class is ready to move on. IF they're ready, then review LCD and move on to simplification of fractions and working with mixed numbers. Pass out a worksheet (W2) that contains problems that require identification of LCD and mixed numbers and simplification of fractions. There will also be problems that require the students to make fractions into mixed numbers and vice versa. Have the students gather in their groups to work on this worksheet (take about 15 minutes). Then have the students take turns presenting the

answers from their group work. Go over any difficulties/misunderstandings. Assign problems, including a few word problems, for homework (H2) to be due the next day.

Significant Points: How do we represent fractions (including mixed numbers)? Understand how to create and work with fraction strips, Cuisenaire Rods, Cuisenaire Fraction Towers, and Base 10 blocks.

Tasks: The class will turn in their homework assignment (H2) and we will go over the answers in class. I will have the class work a few similar problems individually and I will go around and assess individual progress. IF the class is doing alright, then we will move on. I will have stations set up around the room. One station will be a fraction strip workshop, one station will be Cuisenaire Rods, one station will be Cuisenaire Fraction Tower blocks, and one station will be Base 10 blocks. The students will receive a worksheet (W3) that contains blanks for students answers to questions at each station. The stations will allow the students to work with manipulatives that will hopefully help them gain a better understanding of fractions, fraction simplification, and mixed numbers. The worksheet will also guide the students into reviewing addition and subtraction of fractions using the manipulatives. The worksheet (W3) will be due when we are finished with the stations. Survey the class through class discussion how they liked the exercise. No homework tonight.

Significant Points: What are equivalent fractions? More on how to simplify fractions. Compare fractions (which fraction is bigger, smaller?—ordering fractions and mixed numbers from least to greatest and vice versa).

Tasks: Have the question, "What are equivalent fractions?", on the board as the anticipatory set. Have the class create their own fractions strips in pairs—have one pair work with halves, have one pair work with thirds, have one pair work with fourths, etc. Then have the class groups come up with a definition of "equivalent fraction". They are to demonstrate their definitions with their fraction strips. Have the pairs adjust their fractions strips if necessary. Have the students attach their fraction strips in the right order to create a complete block of fraction strips. This complete block will be on display in the classroom (except during quiz/test time). Write the agreed definition of "equivalent fraction" on the board. Show examples of equivalent fractions on the overhead transparency including simplifying fractions and demonstrate through the use of Cuisenaire Rods and Fraction Towers to "see" the equivalency. Hand out a worksheet (W4) that contains such problems to the class to work on individually. Hand out Cuisenaire Rods and Fraction Towers for students to solve the first section of equivalent fraction problems and ordering fraction problems on their worksheet. Then remove the blocks/rods from use and have the class work with scrap paper to draw their own blocks and fraction strips to help them solve the rest of their problems. Informally assess how well each student does the worksheet by walking around the room and checking on work. When they are finished, have the students gather in pairs to check each other's work. Otherwise students are to get started with their homework. Homework (H3): Assign a few word problems that involve using equivalent fractions and have the class correct their

own worksheets. Tell the class to study equivalent fractions and simplifying fractions and let them know about a game for bonus points that will be played tomorrow.

Tasks: Have the class turn in their homework (H3) and the worksheet (W4). Go over the answers to the word problems, have the class copy the answers into their notes. Go over the worksheet (W4) with the class on the overhead. Then have the class gather in groups of three to play an equivalent fraction game (matching cards that are equivalent fractions). The winners will go on to play in the next round. The top three players in the next round will earn 3 bonus points apiece. Hand out index cards for the class to fill out regarding what they've been learning on one side. On the other side, have them write their trouble spots about fractions thus far.

Equivalent Fractions Game: The object of this game is to match together two or more equivalent fractions into piles until there are no more cards left. The winner is the person who completes this process first. There will be a few cards that will not have another equivalent fraction in the group. The teacher needs to have about five groups of cards containing fractions that are unique to that group (i.e. no group of cards is exactly identical to another group). Three students are to compete at a time until all students have gone through one round. Then (if there are enough students in the class) another round will be played making sure that the students will be playing with a different group of cards than in the first round (i.e. no student will have the advantage of playing with the same group of cards they had in the first round). The top three winners of the game will receive three bonus points apiece.

Sub-Key Point: How do we use fractions?
Significant Points: How to add and subtract fractions.

Tasks: First we will cover the trouble areas if any from the index cards from the class and from the shoebox. Next have each group come up with a word problem that would require adding or subtracting fractions. Show the class some examples of how to add and subtract fractions (including mixed numbers). Then have the groups solve their word problem as well as the word problems of the other groups. Have the groups present how to solve their word problem (they are to use some type of visual aid—e.g. pictures, manipulatives, etc.). Assign textbook problems on adding and subtracting fractions and informally assess students' progress. Have them finish assignment for homework (H4).

Significant Point: **Estimation** of Fractions.

Tasks: Have the class turn in their homework (H4) and go over student questions about the homework. If the class is doing well with adding and subtracting fractions, then move on. Have the groups come up with an answer to the following questions: "Can the estimation of fractions be useful? When?". The groups are to debate their answers and

the class will come to conclusions on the answers. Mediate and add on to their answers. Teach the class how to estimate fractions and mixed numbers and when it's appropriate to do so. Work out a few simple examples and two word problem examples. Then have the groups come up with a simple problem and a word problem each. Assign the class to work those problems for homework (H5). The class is to know to use estimation from now on to check their answers in word problems to see if they are reasonable answers.

Continued Sub-Key Point: How do we use fractions? Use the example as an anticipatory set. E.G.: How can I divide up a bag of chocolate chip cookies equally among all class members if there are less cookies than class members?

Continued Significant Point: Estimation.
Tasks: Have the class turn in homework (H5) and go over questions from the homework. Assign problems from their textbook that involve estimation of fractions and mixed numbers to solve simple addition and subtraction problems, one-step word problems, and multi-step word problems. Give the class ample time to work these problems individually. Go around and help students who need it and also informally assess how the class is handling the work. If individuals have finished before the rest of the class, have those individuals gather into groups to discuss the example cookie question which will be on the board. After the class has finished with the assignment, go over the answers by having individuals go to the board and work out the problem. If the class is doing alright with estimating fractions, then move on to the cookie problem. Otherwise do more exercises involving estimation of fractions and mixed numbers. For homework (H6) have the students come up with an answer to the cookie question. More homework on estimation may also be needed.

Significant Point: How do I multiply fractions? How do I divide fractions?

Question on the board: How can I divide up a bag of chocolate chip cookies equally among all class members if there are less cookies than class members?

Tasks: Have the class turn in their homework (H6). Have the class gather into their groups to discuss and solve the cookie question. Have the cookie question as the anticipatory set on the board. Then providing a bag of fake cardboard cookies for each student (small cardboard pieces) have the individual students solve the cookie word problem individually. Try to get the students to discover that it can be to their advantage to multiply or divide to solve problems. Assign a worksheet (W5) that reviews the basic skills of multiplying and dividing fractions (and mixed numbers) and contains such problems.

Tasks: Go over the worksheet (W5) with the students and have them turn in the worksheet at the end of class. Then have the class fill out another copy of the same worksheet (W6) (with different numbers) in groups. Then prompt individuals to go to the

board to work the worksheet problems out. Go over these problems in class. Teach multiplication and division of fractions. Introduce complex fractions. Work with manipulatives such as Cuisenaire rods and towers. Also have the class do computer problems using the website, www.arcytech.org/java/patterns. Assign more addition, multiplication, subtraction, division, LCD, and mixed number problems for homework (H7). Also, assign the students the task (C1) of collecting newspaper articles, journal articles, and internet articles, and recording in writing the use of fractions in radio, television, and billboard advertisements. A total (at least) of 1 article and 1 advertisement is required. The articles/advertisements will be due in four days. Tell the class that they can begin collecting articles and advertisements for decimals and percentages since they will be getting those assignments in the future.

More on multiplication and division of fractions.

Tasks: Ask for questions on the homework (H7) then have the class turn in their homework. Then have the students gather into groups to come up with problems of multiplication and division of fractions. Have the groups work out their problems. Then have the groups post their problems (without the answers) on the board. Have the groups work out the problems of the other groups. Finally have the groups present how to solve their problems to the rest of the class using pictures or manipulatives. Go over any questions or misconceptions. Assign a few word problems (make sure they know to include the estimation step in their word problems from now on) for homework (H8).

Question on the board: How many tanks of gas does it take to get from Tulsa to Bartlesville? From Tulsa to Oklahoma City? From Tulsa to Albuquerque?

Tasks: Have the class turn in their homework (H8) and go over questions. If the class is doing alright with their homework then move on. Have the mileage problem on the board as the anticipatory set. Work the first part of the mileage problem with the class. Provide a set of road atlases and demonstrate how to use the road atlases to find mileage according to driving miles and according to "how the crow flies". Then as a class go over the answers to the mileage word problem. Demonstrate to the class using a computer "Smart Board" (a way to project the computer screen activity onto a projection screen) how to use GIS to determine distance between two points on a map. Have the class work some distance problems in groups of two using GIS. For homework (H9), have the class come up with a list of five other uses for multiplying or dividing fractions. (The teacher could postpone this distance project until the decimals section or could have the class redo this project later using decimals in the "Which is more important to use…" section. This way the students could see that it is easier to use decimals to solve this problem rather than using fractions.)

Tasks: Have students turn in homework (H9). Then ask the class to pair off into groups to come up with a list of three uses for multiplying and dividing fractions. The groups are to present their answers (along with how the multiplication or division can be used). Homework: Assign a worksheet (W7) that will be a review of negative integers and working with negative integers in equations.

Sub-Key Point: What does a negative fraction mean?
Significant Point: Review how to use negative numbers in fractions.

Tasks: Make sure the class has turned in their articles/advertisements project (C1) involving fractions by this point. Have the students turn in their worksheets (W7) and go over the worksheet in class. Have the question: "What does a negative fraction mean?" on the board. Ask the students to gather into their groups to come up with an answer to this question. Write their answers down on the overhead projector and add on to their answers if necessary. Then review negative numbers, the use of negative numbers, the use of negative numbers in equations, and work problems involving negative numerators, negative denominators, and both negative numerators and denominators. Then give the class some practice problems to work on individually and go around and help those who need help. Also make mental notes on who is doing it with ease and who has trouble. Work part of a word problem in class involving negative fractions. Have the class complete the rest of this word problem for homework (H10) as well as doing homework problems involving negative fractions. Tell class to think of their questions/ trouble areas if they have any—that we'll be going over those questions tomorrow. Remind them that asking such questions will help them study for an upcoming quiz.

REVIEW.

Tasks: Pass back the articles/advertisements (C1) and discuss them for a bit. Make sure class knows what you're looking for when they do these type assignments. Then collect the advertisements/articles back up to use in a later project on the importance of fractions, decimals, and percentages. Have the students turn in homework (H10) and go over questions from students about the homework. Review over the material covered thus far in this unit. Go over questions from the shoebox. Have the students come up with five problems of their own: one addition with fractions, one addition with mixed numbers, one addition with complex fractions, one subtraction with fractions, one subtraction with mixed numbers, one subtraction with complex fractions, one multiplication with fractions, one multiplication with mixed numbers, one multiplication with complex fractions, one division with fractions, one division with mixed numbers, one division with complex fractions, one estimation with fractions, one estimation with mixed numbers, one negative with fractions, one negative with mixed numbers, one word problem with fractions, and one word problem with mixed numbers. Have the students trade with another student who is finished until each student is working on one other student's problems. Once the students are finished, have them give their finished work back to the student who gave them their problems. The students are then to grade their partner's work and go over any missed answers with their partner. The partners are to

sign their papers and turn in for credit. For those who finish in class, pass out index cards and ask the students to write down their questions about negative fractions and anything else we've covered up to this point. The other students who have not finished with grading/ working, have them finish for homework and have them complete the index cards for homework (H11). Remind students that they can take an index card, write down their questions, and turn them into the shoebox if they prefer. Tell students to study for a quiz on fractions that will be given tomorrow.

WHAT IS A DECIMAL?

Important note: the topics in this section should always include decimals that are terminating and non-terminating.

Key Point: What is a decimal?
Significant Points: What does a decimal represent? Place values-tenths, hundredths, etc. Comparison of decimals (greater than, less than). The difference between terminating and non-terminating decimals.

Tasks: Collect the remaining homework (H11) and the index cards. Go over concerns listed on the index cards. If appropriate, give the students their **quiz on all the material covered thus far (fractions and mixed numbers)** the same day. Otherwise give the quiz on the following day and move on to the topic of decimals or do further review of previous topics. The quiz will be solving problems (including one-step and multi-step problems) on paper as well as using manipulatives to represent to you (the teacher) certain fractions or mixed numbers. The quiz will allow me, the teacher, to get another assessment (besides informal and homework checks) on how well the students are grasping the concepts of fractions and how well they are applying those concepts. After the quiz, have the class revise their KWL charts and to turn them in.

Have the key point question written on the board as an anticipatory set. Divide the class into different group arrangements than they had during the fractions section. Have the groups answer the question, "What is a decimal?" and present their answers to the class. Write their answers on the board and add to the final list if needed. Have the class write this list in their notes. Review the place value system—tenths, hundredths, thousandths, etc. Have a poster/visual aide on the wall that shows this system. Go over terminating and non-terminating decimals. Do exercises in comparing decimals (greater than, less than comparisons). An example of an exercise is to have flash cards of terminating and non-terminating decimals and to call on individual students to tell you whether it's a terminating or non-terminating decimal. Another example of an exercise is to have flash cards of two decimal numbers on a card with a question mark between the two numbers. The students will then need to tell you whether one number is greater than, less than or equal to the other number. A third example is to have flash cards of numbers that have a certain digit underlined. Have the students identify the place value of the underlined number. Any of these examples can be manipulated to become bonus point exercises or games.

Assign homework (H12) over identifying terminating and non-terminating decimals, decimal place values, and decimal comparisons (terminating and non-terminating). Also

have the class write a self-assessment paper (P1). In this paper have the students reflect on how they think they're doing in class and why, what they're learning, what has been difficult and what has been easy, and anything else they feel is important. (The teacher needs to make sure everything is on track for doing the grocery store field trip).

Significant Points: Converting fractions including mixed numbers and complex fractions into decimals (terminating and non-terminating) and vice versa. Comparing fractions and decimals (greater than/less than/equal to).

Tasks: Pass back the graded quizzes and go over the answers. Ask for questions about the quiz. Have the students correct their mistakes on a separate piece of paper for homework (H13). Have the students turn in homework (H12) and go over their questions. Remind the students to turn in their self-assessment papers the next time you have class. Pass back the KWL charts so that the students can use them to help with writing their self-assessment papers.

Have the class work in groups to figure out how to convert fractions to decimals (terminating and non-terminating) and decimals (terminating and non-terminating) to fractions by using Cuisenaire Rods and Towers. Then show the class how to convert back and forth on paper and work some examples. Assign the class some problems including a couple of word problems (multi-step). Have the students work these problems in pairs. Go around assessing progress. Then have individuals present their work to the class. Next, have the class get into their groups to work comparison problems between fractions and decimals using manipulatives. Have the class study for a bonus quiz (a quiz where students can earn bonus points) on comparing fractions and decimals.

Significant Points: Addition and subtraction of decimals (terminating and non-terminating).

Tasks: Give the students their bonus quiz. After students have handed the quizzes back to you, go over the answers.

Have the students turn in their homework (H13) and go over questions from the homework. Have the students turn in their self-assessment papers (P1). Review the addition and subtraction of decimals (terminating and non-terminating) -including negative decimal numbers. Use manipulatives (including paper money and Cuisenaire rods and towers) to show addition and subtraction of decimal numbers. Also have students use Microsoft Excel to display pie charts that have various decimal pieces comprising the whole pie. Assign homework problems (H14) addition and subtraction of decimal numbers—including a couple of word problems. Tell the class that there will be a grocery store field trip (tell them specific date) and pass out permission slips for the students to get filled out by their parents.

Significant Point: Estimation of decimals (terminating and non-terminating).

Tasks: Pass back the graded bonus quizzes. Have students turn in their homework (H14) and then go over their questions from their homework. Go over any issues from the self-assessment papers (P1) that you feel are important (maybe keeping the origin of the issues anonymous). Have the students gather in their groups to solve estimation of decimals (terminating and non-terminating) problems of addition and subtraction. Have individuals present to the class their answers to the problems. Go over examples of when you should and should not estimate decimals in problem solving and do addition and subtraction examples using estimation. Assign problems (including one-step and multi-step word problems) involving addition and subtraction of decimals with and without using estimation and to compare answers of similar problems. The students are to state when it's alright in their homework to use estimation and why. Have the class work on these problems in class and informally assess how they do. Have the class finish these problems for homework (H15).

Significant Points: How to multiply and divide decimals (terminating and non-terminating).

Tasks: Have students turn in homework (H15) and go over students' questions. Give a worksheet (W8) that has similar problems to the students' homework problems from (H15). Have the class work this sheet in groups. Go over this worksheet in class, prompting individuals to work the problems on the board. Have the class do a show of hands to assess if they're ready to move on. If they are ready then, give a worksheet (W9) that instructs the students on how to multiply and divide decimal numbers (terminating and non-terminating) and includes some problems for the students to work out. The students are to complete this worksheet for homework. Also, assign the students the task (C2) of collecting newspaper articles, journal articles, and internet articles, and recording in writing the use of decimals in radio, television, and billboard advertisements. A total of 1 article and 1 advertisement is required. The articles/advertisements will be due in four days.

Significant Points Continued: How to multiply and divide decimal numbers.

Tasks: Have the following questions on the board as the anticipatory set: A) How is a baseball pitcher's ERA calculated? B) How much milk is in the different containers at the grocery store? Give your answer in gallons, quarts, and liters and develop a conversion chart for these units of measurement.

Have students turn in their worksheets (W9) and go over the answers. Go over how to multiply and divide decimals with and without estimation. Then have the class work in pairs on another worksheet (W10) similar to (W9) but includes estimation. Have the class discuss how the estimation process helps with the working of decimal problems and

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to discuss when they think it's good to use and when it's not so good to use estimation. Write down their reasons on the board and add to or adjust those reasons if necessary. Go over the worksheet (W10) and have the students turn in them in. Then, have the class divide up into their groups to work a few word problems in which the estimation step is included as a part of the process of checking the final answers. Then go over how to calculate a pitcher's ERA by using a real example. For homework (H16), assign the students to work word problems (single- and multi-step). Hand out index cards for the class to fill out what they've learned thus far on decimals on one side. On the other side, have them write their trouble spots about decimals. Remind the class about the grocery store field trip and go over the worksheet (W11) that will be given to them for the field trip. Discuss the second anticipatory set question.

Grocery Store Field Trip!
Tasks: The students are to go into the grocery store and listen to an interview between the teacher and the manager about the importance of decimals in the grocery store business. (This will allow the students to see a demonstration of the interview process that they are to conduct themselves later as a part of their final assessment.) Then the students are to fill in a worksheet (W11) about the price of a list of meat and produce items. This worksheet will bring focus to the questions: How are apples priced and why? The students are also to answer the following question on their worksheet: How much milk is in the different containers at the grocery store? Give your answer in gallons, quarts, and liters and develop a conversion chart for these units of measurement.

Tasks: Have the class gather in their groups to discuss the important points from the grocery store field trip and interview. Have a class discussion over these points. Go over the worksheets (W11) from the grocery store field trip. Have students hand in their worksheets (W11). Have the students turn in their homework (H16). Go over any questions from the homework. Go over any trouble spots indicated on the index cards (both from the shoebox and from the ones handed out in class). Present the class with the chart of the International System of Measurement (SI) and the U.S. Customary System of Measurement (include distance and weight). Have the class gather into groups to come up with conversions between the two systems. Have the groups present their conversions. Have a grand conversion chart on the wall and have the groups take turns in filling out this chart. Using the charts, have the students estimate and measure the dimensions of the classroom (height, width, and length) in inches, feet, centimeters, meters, yards, miles, and kilometers.

Tell students to study for a quiz on decimals and fractions.

Tasks: Have the students hand in their articles/advertisements (C2) on decimals. Give a quiz on decimals and fractions. Have the students turn in their quizzes. Go over answers when finished. The quiz will allow me, the teacher to get another assessment (besides

informal and homework checks) on how well the students are grasping the concepts of fractions and decimals and how well they are applying those concepts. The quiz will contain some basic working problems, a multiple choice section for definitions, and some word problems.

WHAT IS A PERCENTAGE?

Key Point: What is a percentage?
Significant Point: Calculating a percentage.

Anticipatory set: What is a percentage? When watching the voting results on television, what do the percentages mean?

Tasks: Pass back articles/advertisements (C2) on decimals and briefly discuss. Then collect them back up for use in a later project on the importance of fractions, decimals, and percentages.

Pass back the quizzes from the decimals section and go over them with the class. Move on to the percentage section if the class has mastered the decimal section to your satisfaction.

Do a KWL chart with the class.

Have the question, "What is a percentage?", on the board as an anticipatory set. Have the class break into groups (different than decimal groups) to answer the question, "What is a percentage?". Then have representatives from the groups present their answers. Write the big points on the board and have the class copy these points down. Next have the class groups discuss the voting percentages question. Have the groups present their answers. Go over how to calculate such a percentage and how to calculate percentages in general. Write a couple of school issues on the board and have the class vote on these issues on paper ballot. Have a couple of students count the votes and have the class calculate the percentages. Assign a few homework problems (H17) that involve calculating percentages. Have the class begin work on their self-assessments papers (P2) and let them know when they're due.

Significant Points: Comparing fractions (including mixed numbers), decimals (terminating and non-terminating), and percentages (greater than, less than, and equivalent). Converting between fractions (including mixed numbers), decimals (terminating and non-terminating), and percentages.

Tasks: Have the class turn in their homework (H17) and go over questions from the homework. Have the class do a workshop of converting and comparing between fractions (including mixed numbers), decimals, and percentages by having them complete worksheets (W12) cover the stations in the workshop. One station will have the students compare and convert between the three forms (fractions, decimals, and percentages)

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using Cuisenaire rods. Another station will have them compare and convert using Cuisenaire towers. Another station will have them compare and convert using pie charts in Microsoft Excel. Another station will have them work two word problems that involve comparing and converting into percentages. When the students are finished going through the stations, then go over the answers to the worksheet (W12) and have the students turn in their worksheets. Assign for homework (H18) a few comparison problems and assign a few word problems that involve converting from fractions and decimals into percentages and vice versa. These word problems will involve taking note of characteristics of the classroom and school (e.g. what fraction and percentage of the desks in this room are occupied by students?). One word problem should be: What is your % score if you got 70/90 points? 55/100 score? 87/115 score? They should use an intermediate step of using decimals and should use estimation to check their answers.

Anticipatory Set: Have this question on the board: What does % daily value mean on a bottle of milk?

Tasks: Have students turn in homework (H18) and go over questions. Further go over how to convert between fractions (including mixed numbers and complex fractions), decimals (terminating and non-terminating), and percentages. Have the class work basic and multi-step converting problems from their textbook in class (H19). Assess their progress. What they don't finish in class becomes their homework. Have the class do research to find the answer to the % daily value question as a part of their homework.

Significant Points: Positive and negative percentages. Addition and subtraction of percentages.

What does a percentage greater than 100% mean?

Tasks: Have the students turn in their self-assessment papers (P2). Have the students turn in their homework (H19) and go over questions from the homework. Review how to add and subtract percentages. Have the groups discuss what a negative percentage means and what a percentage greater than 100% means. Have the class come to a concensus on the two issues. Show percentages using a pie chart. Have the class work problems in Microsoft Excel on the computer to generate various pie charts using percentages. Have the class represent percentages and their addition and subtraction using manipulatives (e.g. Cuisenaire rods and towers). Work a couple of multi-step word problems that involve addition and subtraction of percentages. Have the groups come up with one problem each of adding and subtracting percentages. Assign these problems for homework (H20).

Significant Points: Multiplication and division involving percentages.

Tasks: Have the students turn in homework (H20) and go over questions. Give a worksheet (W13) that reviews multiplying and dividing percentage numbers and includes such problems for students to work out. Have the students do this worksheet in their groups. Go over the answers. Then hand out a similar worksheet (W14) and have the class do it individually. Go around and assess their progress. Have the students hand in both their worksheets (W13 and W14) when they are finished. Go over the answers and any questions to worksheet (W14). Have the groups discuss estimation of percentages— when it's good and not so good to do. Also, assign the students the task (C3) of collecting newspaper articles, journal articles, and internet articles, and recording in writing the use of percentages in radio, television, and billboard advertisements. A total of 1 article and 1 advertisement is required. The articles/advertisements will be due in four days.

Significant Point: Estimation of percentages.

Anticipatory set: What percent of the Earth is covered by land, ice, and water?

Tasks: Hand back the self-assessment papers (P2) and go over any issues if necessary. Have the Earth question on the board. Have the students work in pairs on GIS to come up with their estimates. Then have the pairs volunteer numbers. Discuss the different answers. Have the groups discuss when it's "ok" to estimate percentages and when it's not. Refer back to the voting percentages as an example on when it's not ok. Have the groups come up with different scenarios of when it's ok and not ok to estimate percentages. Have the groups represent these scenarios with word problems. Adjust these word problems if necessary and assign the problems for homework (H21).

Tasks: Have the class turn in homework (H21) and go over questions from that homework. Have the class start preparing for a quiz on percentages. Have a review over the percentages topics. Have class think of their questions/trouble areas on percentages (decimals and fractions included) for homework (H22). If they do not have any questions/trouble areas, have them create a unique word problem and to solve that word problem for homework. As a part of the review, have the class work a worksheet (W15) for bonus points. This worksheet will contain problems that involve calculating percentages, converting between and comparing (greater than, less than, or equal to) between decimals, fractions, and percentages. Have the class turn in their bonus worksheet in class.

Tasks: Pass back the bonus worksheet (W15) and go over any questions. Ask class to write down on index cards their questions/trouble areas that they still have on percentages and other topics onto index cards (H22). If they created word problems, then have them write down their word problems and answers on the index cards. Collect the cards and

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go over answers to questions with the class. When finished, remind students of quiz tomorrow over percentages topics.

Tasks: Have the class turn in their articles/advertisements (C3) on percentages. Give the class a quiz on percentages. Have the students turn in their quizzes. Go over answers when finished. The quiz will allow me, the teacher to get another assessment (besides informal and homework checks) on how well the students are grasping the concepts of percentages and how well they are applying those concepts. The quiz will contain some basic working problems, a multiple choice section for definitions, and some word problems.

WHICH IS MORE IMPORTANT TO USE: FRACTIONS, DECIMALS, OR PERCENTAGES? WHY?

Key Points: Which is more important to use: fractions, decimals, or percentages? Why?
Significant Points: To know when it is appropriate to use fraction, decimal, or percentage form when formulating and solving problems.

Tasks: Hand back the articles/advertisements on percentages (C3) and briefly discuss them. Then take them back up for use in a later project on the importance of fractions, decimals, and percentages.

Hand back the graded quizzes and go over any questions about the quiz. Do a KWL chart with the class.

Have the class gather into three groups. Assign one group to debate on fractions being more important. Assign another group to debate on decimals being more important. Assign the third group to debate on percentages being more important to use. After about 5 minutes of discussion give each group a chance to debate their issue to the class. Write the important points on the board and have the class copy these points into their notes. Try to get the class to conclude that the importance is dependent on the context in which they're to be used. Homework: Hand out a worksheet (W16) to each student with the following set of questions on the worksheet.
1) How would you express a test score and why?
2) How would you "keep time" in music? In Olympic track races? Why?
3) How would you express the weight of different types of fruit in your store? How much does an apple cost at a local grocery store? Why?

Have the class do the worksheet for homework and be ready to discuss their answers tomorrow. Tell the class that they can find their information in the library, on the internet, in an encyclopedia, in a dictionary, and in their own experiences. They can interview musicians and track athletes or coaches as well. They can also call a grocery

store for answers. Let the class know that they'll need to be able to describe in their own words, "why". They can also refer back to the information they got from the grocery store field trip. Tell the class to get started on their third self-assessment paper (P3) and tell them when the papers are due.

Tasks: Have the students gather in their groups to discuss their answers to yesterday's worksheet questions (W16). Have a class discussion on the groups' answers.

Call on individuals for answers to the questions. Then ask for any other volunteers for answers. Have the students gather in their groups to debate the answers given. Ask the class to take their worksheets (W16) home again and adjust or add on to their answers in a different color pen or pencil for homework to be turned in tomorrow. Give the class a different worksheet for homework (W17) that involves solving fraction, decimal, and percentage word problems. The word problems would involve the students finding the answer in fraction, decimal, and percentage (if applicable) form. The word problems would ask the students which form is appropriate for the answer.

Tasks: Have the students turn in their worksheets (W16 and W17) and word problems. Ask individuals to work similar problems on the board. Go over any other questions from the worksheet (W17). For homework (H23), have the class come up with three problems: one involving fractions, one involving decimals, and one involving percentages.

Tasks: Have the class turn in their self-assessment papers (P3). Next, do the Lemonade Project. Have the students make lemonade using ingredients in decimal, percentage, and fraction form. First have the class obtain the fraction measurements using measuring cups and measuring spoons. Have the class estimate the decimal amount and percentage amount (such as 0.60 cup and 60% of a cup). Then have the class convert from the fraction form to the decimal and percentage form. Have the students check their estimated answers with their calculated answers. Then have the class measure the weight of the solid ingredients in grams on a scale. Have the class measure the amount of liquid ingredients as milliliters and liters. Then have the class write up the recipe in fraction, decimal, and percentage form. Also have the class write up the recipe using the weight of the solid ingredients in grams and the amount of liquid ingredients in liters and milliliters. Discuss the results and come up with a conversion between the weights of the solid ingredients to their measurement in decimal form. Also have them come up with a conversion between the amount of the liquid ingredients in liters and milliliters to their measurements in decimal and fraction form. Finally have the class determine the percent composition of the individual ingredients within the final lemonade product (for example, have them measure the total number of cups of liquid within the pitcher and then have them use their earlier individual percentages (such as 60% of a cup)). Discuss which

form (fraction, decimal, or percentage) was easier to use in making the lemonade and why. Compare this project to a chemistry experiment.

Tasks: Hand back the self-assessment papers (P3) and discuss any issues from those papers as necessary. Have the students trade their homework (H23) (their three problems) with a partner. Then ask the class to provide you with three good decimal problems. Have the class partner up to work these problems. Go around the room observing their progress and helping individuals who need it. Finally as a class, go over the answers and also ask if the answer or problem would be better written in fraction, decimal, or percentage form. Ask why. Go over shoebox questions.
For homework, have the class do a review worksheet (W18) on fractions, decimals, and percentages and include a few word problems.

WHY ARE FRACTIONS, DECIMALS, AND PERCENTAGES IMPORTANT?

Key Points: Why are fractions, decimals, and percentages important?

Significant Points: The students should be able to state why they think fractions, decimals, and percentages are important in other school subjects and outside of school. They should know that they allow for people to communicate concepts, represent portions, and solve problems.

Tasks: Have the students turn in their worksheet (W18) and go over any questions. Have the students gather in their groups to discuss "Why are fractions, decimals, and percentages important?". Have them discuss where in other subjects and in the "real world" they are important. Have the groups present their answers to the class and have the rest of the class debate in support or non-support for each group's answers.
Homework (H24): Answer the question: What can you find in your home that uses decimals, fractions, and percents?

Tasks: Have the students turn in their homework (H24). Have the students gather in their groups to come up with five places/ways that fractions, decimals, and percentages are used on things around the house. Then have two **speakers** come into the class to discuss how they feel decimals, fractions, and percentages are important in their lives. For homework (H25) the class is to list five ways that fractions, decimals, or percents were important in the speakers' lives.

Tasks: Have the class turn in their homework (H25) and to discuss their answers as a class.

DEWEY DECIMAL SYSTEM—Have the class take a field trip to their school library and have the class go around the library to find out what the Dewey decimal system is. Have the librarian give a presentation on the system and tell the class about the man named Dewey. Have the librarian discuss how decimals are important in the library system. Have a class discussion with the librarian on the importance of the Dewey Decimal System and how decimals, fractions, and percentages are important in libraries.

Tasks: Have the class do the census data project. The class is to work on the U.S. Census website (www.census.gov) to gather data and form charts using that data. The charts and data results are to include pie charts and bar graphs in Microsoft Excel or some other similar program. The charts and data are to include decimals, percentages, and fractions.

Tasks: Have the class analyze the rain gauge and thermometer data. Discuss the results and have the class discuss the importance of converting between measurement systems (Celsius and Fahrenheit) and the importance of keeping such records. Have the class answer the question for homework (H26): Who is interested in knowing the temperature and rainfall amounts? (E.G. farmers).

Tasks: Have a class turn in their homework (H26) and have a class discussion on the homework question.

Then, have the class gather in their groups to discuss the question: Why are decimals, fractions, and percentages important? Do a KWL chart with the class. Then for homework (H27) have the students rewrite their paper from the beginning of the unit, "how decimals, fractions, and percentages are important". Also have the students begin writing their final self-assessment paper (P4).

PRESENTATIONS. Have the students give their presentations (this may take a couple of days depending on the class size and the length of class questions/discussions pertaining to the presentations). Then have the students turn in their paper (H27) after all presentations have been given.

Hand back final assessment projects with grades and answer questions about grades.

Pass out index cards and have the students list their trouble areas and questions. Tell class that there will be a review for the final test. Have the students turn in their self-assessment papers (P4).

Have a one or two class period review for the final test. Go over any issues from the final self-assessment papers if necessary. Also go over questions from the index cards passed out in class and from the shoebox.

FINAL TEST—Have the students take a final cumulative test on the unit. Have definitions, true/false, short answer, one-step and multi-step problems including word problems. Also have the students demonstrate concepts using manipulatives.

FINAL ASSESSMENT

This final assessment is addressed to the students who would be doing these final assessment tasks. The due dates for each part are "approximate" because the teacher will need to be the one to determine the most appropriate due dates.

<u>**Assessment Tasks/ Final Project**</u>:

PART I—Begin this part in week 4 (approximately). Turn in a rough draft at the end of week 6 (approx.).

Choose two careers that you would like to pursue later in life. How would fractions, decimals, and percentages be important in those careers? Write an essay which will present your career choices and your answer to the question. Be sure to state why you chose those careers and to give a detailed answer to the question. You will need to use five resources in your essay. BONUS (worth 10 extra points): Interview an adult who has a career that interests you and find out how they use fractions, decimals, and percentages. Write a paper that describes the interview and includes your interview questions and responses. The paper needs to be at least one typed page in length.

PART II—Begin this part in week 4 (approx.). Turn in a rough draft by the end of week 5 (approx.).

Interview an adult relative, a scientist or science teacher, and a doctor, veterinarian, dentist, or nurse about how they use fractions, decimals, and percentages.

Using their answers, write three problems in which they will use fractions, decimals, or percentages. Then solve these problems giving your answer in decimal form, fraction form, and percentage form. Then write persuasive paragraphs on which form is the best one to use in each problem.

PART III—Begin this part in week 7 (approx.). Turn in an outline of your presentation at the end of week 7 (approx.).

Create a 5 – 10 minute presentation on your project. Be ready to answer questions after your presentation.

PLEASE READ THE ATTACHED INSTRUCTIONS AND RUBRIC FOR EACH PART.

INSTRUCTIONS FOR PART I

You will need to think about the type of careers that interest you and that you may want to pursue later in life. Think about why those careers interest you and research those careers. Find out how fractions, decimals, and percentages could be used in those careers.

RESOURCES: <u>When researching, you need to use **5 resources**. At least one resource needs to be a journal article and at least one resource needs to be an encyclopedia.</u> Other resources may be interviews, textbooks, books, newspapers, web pages (make sure these pages are appropriate to use), letters/brochures/magazines from organizations/companies, and anything else approved by me.

If you do an interview, you should at least include the interview questions on the next page. Your interview questions need to be pre-approved or else you will only receive at the most 5 bonus points at the most for your interview.

ESSAY: Your essay will:

1. State two or three career choices that you find interesting and may want to pursue in your future.

2. Describe these career choices and why you're interested in them.

3. Describe how fractions, decimals, and percentages may be used in each of those careers.

4. Be at least 2 typed pages long and include information from your five resources. The essay should have a reference section which should include your five resources.

PART I RUBRIC: Part I is worth a total of 40 points. You can earn an extra 10 bonus points. You will earn the total of 40 points if your Part I gets a score of 4 on the following scale.

4   Essay is at least 2 pages long and is typed. It includes references to five sources. It has a reference section with five sources appropriately cited. The essay describes at least two careers and why they were chosen. The essay is well-written, grammatically correct, and gives in-depth detail. The essay describes in-depth and with unique perspective how fractions, decimals, and percentages can be used. One resource is at least an encyclopedia and one source is at least a journal article. The sources are very relevant to the topics. The work overall shows very good, detailed thought and effort. The student turned in their rough draft in time. The final work included improvement from the rough draft.

3   Essay is at least 2 pages long and is typed. It includes references to five sources. It has a reference section with five sources appropriately cited. The essay describes at least two careers and why they were chosen. The essay is grammatically correct and gives some detail. The essay describes how fractions, decimals, and percentages will be used. One resource is at least an encyclopedia and one source is at least a journal article. The sources are relevant to the topics. The work overall shows good thought and effort. The student turned in their rough draft in time. The final work included improvement from the rough draft.

2   Essay is at least 2 pages long and is typed. It includes references to three to five sources. It has a reference section with three to five sources cited. The essay describes at least two careers and why they were chosen. The essay is mostly grammatically correct and gives little detail. The essay describes how fractions, decimals, and percentages will be used. One resource is at least an encyclopedia or a journal article. The work overall shows some thought and effort. The student turned in their rough draft late. The final work included some improvement from the rough draft.

1   Essay is not at least 2 pages long or is not typed. It includes less than three references. It has a reference section with less than three references or does not have a reference section. The essay does not describe at least two careers or does not describe why they were chosen. The essay is partly grammatically correct or mostly grammatically incorrect and gives very little or no detail. The essay does not describe how fractions, decimals, and percentages will be used. No resource is at least an encyclopedia or a journal article. The work overall shows little or no genuine thought and little or no effort. The student turned in their rough draft late or not at all. The final work included little or no improvement from the rough draft.

0   No work turned in for Part I.

BONUS INTERVIEW RUBRIC (only amounts of 10, 5, and 2 points available for students to earn)

10   Paper is at least two pages in length. Paper includes all interview questions and responses. Paper describes the interview in detail including listing the name and occupation of the person being interviewed.

5   Paper is at least one page in length. Paper does not include all interview questions or responses. Paper includes little detail.

2   Paper is less than one page in length. Paper includes little or no interview questions or responses. Paper includes little or no detail of the interview.

INSTRUCTIONS FOR PART II

You will conduct a total of at least three interviews. You are to interview an adult relative, a scientist or science teacher, and a doctor, veterinarian, dentist, dental assistant, veterinarian technician, pharmacist, nurse, or a person in other related fields. The interview is to be about how they use fractions, decimals, and percentages. See me if you have questions on whether someone qualifies to be interviewed.

You will need to turn in a copy of your interview questions and have them approved before you conduct the interview. After the interviews, you will turn in your interview questions and answers to those questions. You will need to at least use the following interview questions in each of your interviews:

1) What is your name and career?
2) Do you use fractions in your career? How?
3) Do you use decimals in your career? How?
4) Do you use percentages in your career? How?
5) Are fractions, decimals, or percentages used in other ways in your career field?

Always thank the people you interview and offer to give them a copy of the interview. (Thank you cards will be written later in class for bonus points.)

You will use their answers to write three word problems. Each word problem will need to involve using fractions, decimals, or percentages in one of the careers. (You may include one of the careers you chose in Part I). Then you will solve these problems giving your answer in decimal form, fraction form, and percentage form. Then you will need to write persuasive paragraphs on which form is the best one to use for each problem. This paragraph will need to give your reasons.

PART II RUBRIC: Part II is worth a total of 40 points. If you meet the criteria of number 4 in this rubric, then you will earn all 40 points.

4   The interview questions were turned in and approved prior to the interview. Six or more interview questions were used and included the five required interview questions. The extra questions were relevant and genuine. An adult relative, a scientist or science teacher, and a doctor, veterinarian, dentist, or nurse were interviewed. Each set of completed interviews were turned in on time. The completed interviews were typed. The completed interviews showed good effort. Three word problems and their answers were neatly typed and turned in on time. The word problems showed genuine effort and thought. Each word problem used fractions, decimals, or percentages in one of the careers. The word problem answers were complete and were given in decimal form, fraction form, and percentage form. The persuasive paragraphs were neatly typed. The paragraphs persuaded the reader on which form was the best form to use in each word problem. The paragraphs included detailed reasons "why" the form was the best for each problem. The interviews, problems, answers, and paragraphs were grammatically correct and well-written.

3   The interview questions were turned in and approved prior to the interview. The five required interview questions were used. If used, the extra questions were relevant. An adult relative, a scientist or science teacher, and a doctor, veterinarian, dentist, or nurse were interviewed. Each set of completed interviews were turned in on time and are neatly written or typed. The completed interviews showed effort. Three word problems and their answers were neatly written or typed and turned in on time. The word problems showed effort and thought. Each word problem used fractions, decimals, or percentages in one of the careers. The word problem answers were complete and were given in decimal form, fraction form, and percentage form. The persuasive paragraphs were neatly written or typed. The paragraphs persuaded the reader on which form was the best form to use in each word problem. The paragraphs included reasons "why" the form was the best for each problem. The final interviews, problems, answers, and paragraphs were grammatically correct.

2   The interview questions were not turned in and/or not approved prior to the interview. The approved set of interview questions were not used in the actual interview. Only three or four of the five required interview questions were used. Only two of the required adults were interviewed. Each set of completed interviews were turned in late and are written. The completed interviews showed little effort. Only two word problems and their answers were written or the word problems were turned in late. The word problems showed little effort and thought. Each word problem did not use fractions, decimals, or percentages in one of the careers. The word problem answers were incomplete and were only partly given in decimal form, fraction form, and percentage form. The persuasive paragraphs were written. The paragraphs did part or little persuasion of the reader on which form was the best form to use in each word problem. The paragraphs only addressed two of the three word problem situations. The paragraphs did not include reasons "why" the form was the best for each problem. The final interviews, problems, answers, and paragraphs were only partly grammatically correct.

1   The interview questions were not turned in prior to the interview. Less than three of the five required interview questions were used. Less than two of the required adults were interviewed. Each set of completed interviews were not turned in or are poorly written. The completed interviews showed very little or no effort. Less than two word problems and their answers were written or the word problems were not turned in or turned in late. The word problems showed very little or no effort and thought. Each word problem did not use fractions, decimals, or percentages in one of the careers. The word problem answers were very incomplete and were not given in decimal form, fraction form, and percentage form OR the answers were not done at all. The persuasive paragraphs were poorly written. The paragraphs did very little or no persuasion of the reader on which form was the best form to use in each word problem. The paragraphs only addressed one or no word problem situations. The paragraphs did not include reasons "why" the form was the best for each problem. The final interviews, problems, answers, and paragraphs were poorly done with many grammatical mistakes.

0   No work turned in for Part II.

INSTRUCTIONS FOR PART III

PRESENTATION—You will need to create a five to ten minute presentation on your project (Parts I and II). This presentation should contain the following:

1) Summary of the careers you chose and why. Summary of the bonus interview. Summary of how fractions, decimals, or percentages were important in your career choices.
2) Summary of the interviews you did. Presentation of the word problems and their answers. Summary of your persuasive paragraphs.
3) Summary of how you think fractions, decimals, and percentages are used in your life now.
4) Summary of how you think fractions, decimals, and percentages are important in life.

PART III RUBRIC: The presentation is worth 20 points total.

4   Your presentation is within the ten minute time range. Your presentation was smooth in delivery with a lot of eye contact with your audience. Your presentation shows that you covered very well what you were supposed to. Your presentation contained all the above requirements. Your presentation showed good effort and good insight.

3   Your presentation is within the ten minute time range. Your presentation was mostly smooth in delivery with some eye contact with your audience. Your presentation shows that you covered what you were supposed to. Your presentation contained all the above requirements. Your presentation showed effort and some insight.

2   Your presentation is three or four minutes or 11 to 15 minutes. Your presentation was choppy in delivery with little eye contact with your audience. Your presentation shows that you only partly covered what you were supposed to. Your presentation contained two to three of the above requirements. Your presentation showed little effort and little insight.

1   Your presentation is less than three minutes or beyond 15 minutes. Your presentation was very choppy in delivery with very little or no eye contact with your audience. Your presentation covered little or no topics that you were supposed to. Your presentation contained less than two of the above requirements. Your presentation showed very little or no effort and very little or no insight.

0   No presentation done.

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