

@ Tech & Math **Workshop has (8) units but only (5) need to be completed with a PBL Lesson!** @

@ **Note: Two paragraphs are required for each of the assignments!** @

### Intermediate Numbers **Lecture** Summary \* First & Last Name

This **Numbers 1** deals with more challenging problems in addition, subtraction, multiplication and division of intermediate numbers (whole numbers, fractions, mixed numbers, and decimals). At least challenging for 4<sup>th</sup> Graders and could be done better in the second half of the year. Addition will include carrying. Addition of fractions with unlike denominators will need first find the least common denominator. Subtraction will include borrowing. Division will have remainders, and the remainders will be expressed as fractions. Answers containing fractions must be reduced to simplest terms. Checking work is very important. We will also work with exponents and radicals, which can be exciting since they are done in such an easy approach.

**Ratios and proportions** are also included in this section. Proportions have equal ratios. The product of the mean equals the product of the extremes. Missing numbers in proportions is good higher level thinking, and it's a good idea to change the position of the missing number for practice. Proportions will help the students with percentages. Practice and checking are important. We also need to be sure we introduce students to percentages over 100. They aren't more difficult, but can throw a student off if they haven't seen it before. Exponents, radicals, proportions, and percentages challenge students but with the garden approach, they can be **promoted and motivated** students. All in all this holistic approach does have merit but teachers need to be flexible to use it.

## Intermediate Numbers **Reading** Summary \* First & Last Name

**Reading deals** with similar problems in addition, subtraction, multiplication and division of intermediate numbers (whole numbers, fractions, mixed numbers, and decimals). Addition will include carrying. Addition of fractions with unlike denominators will need first find the least common denominator. Subtraction will include borrowing. Division will have remainders, and the remainders will be expressed as fractions. Answers containing fractions must be reduced to simplest terms. Checking work is very important. We will also work with exponents and radicals, which can be done and will excite students. **Patterns and sequences** definitely are needed.

**Proportions** are also included in this the reading. Proportions have equal ratios. The product of the mean equals the product of the extremes. Missing numbers in proportions is good higher level thinking, and it's a good idea to change the position of the missing number for practice. Proportions will help the students with percentages. Practice and checking are important. We also need to be sure we introduce students to percentages over 100. They aren't more difficult, but can throw a student off if they haven't seen it before. **Exponents, radicals, proportions, and percentages** challenge students but with the garden approach as stated before they and be motivation.

## Intermediate Numbers **Activity** Sheets \* Summary & First & Last Name

**Grouped Computations** – 2A, 2B, 2C and 2D. I like the **collaborative approach** of having students work together in teams of three. Having the students learn from their mistakes is extremely important. Students can often understand each other's questions and explanations. The mixed computations would be helpful practice, but since these concepts are more difficult, I think the **grouped computations** would be helpful to do first. I also like the idea of scratch paper divided into different regions. Organization is very important to learning, and many of our students need help to learn organizational strategies. I checked out the **mixed problems** and even though they are the same as the grouped ones they will be a challenge but teaching is challenging students.

**For fourth grade**, I would encourage the students to **rewrite the problems vertically**, and we would work on lining up properly with careful placement. My students would also need more space between problems, even though the work will be done on scratch paper. Older students, I am sure, could handle these as is. Fourth graders have to make a **significant transition** because third grade is still primary, and there is generally a big leap to fourth grade, ( Boy, I can believe that for sure!) both in terms of concepts and in terms of responsibility. The focus of the garden approach does incorporate success and motivation with the unique structured approach. This approach appears to be for 5<sup>th</sup> and certainly 6<sup>th</sup> graders and will be a much needed supplement to traditional approach.

## Intermediate Numbers **Websites** Summary \* First & Last Name

**NCTM Illuminations** (<http://illuminations.nctm.org/>) is a wonderful website. It is the site of the National Council of Teachers of Mathematics, and it has 540 lessons and 102 online activities for kindergarten through twelfth grade. There are also 724 links to websites they have deemed exemplary. The site is organized by math strand and grade level. The Fraction Model (<http://illuminations.nctm.org/ActivityDetail.aspx?ID=11>) is wonderful. It gives a great visual representation and shows the related fraction, decimal, and percent. You can also choose to show the value in a circle or rectangular model. The lessons are high interest and engaging. For example, one lesson uses the story of *The Three Little Pigs* to motivate students to think and reason mathematically in various ways. Students develop reasoning skills and identify similarities and differences through the use of a Venn Diagram.

**Superkids** (<http://www.superkids.com/aweb/tools/math/>) is another good website. This site allows a teacher or parent to create activity sheets by selecting the parameters. There are 16 different options to choose, from addition to exponents to telling time. These sheets can be highly customized. For example, the subtraction option asks if you want basic, advanced, or horizontal subtraction. From there, it asks for the maximum and minimum values to be used, and whether or not you want to include decimals and negative numbers. Students who need help can be given sheets that will allow them to have success, and students who need to, can be challenged. This is a great site to give parents who want to create practice for their children to work on at home.

( Sample Assignment ) PBL Lesson Week # \*\*\* First and Last Name

State Theme of PBL, Design Major Question, Plan for Assessment, Layout Project, Describe Components

**Introduction**: Biology, the study of life, and Ecology, the study of where life lives, will give students many doors to open as they explore this **project based lesson (PBL)**. Environmental studies are a hot button topic these days. Without stepping into politics, students will develop ideas and strategies to help their school environment. Students of all ages need to appreciate what surrounds them and think outside of box on how to better use what is available instead of always buying new . PBL will target technology integration, language, math, science, and oral speaking skills.

The driving force behind **this PBL is recycling** within their school environment and reusing the supplies in a different capacity within the school environment. “How can we make our school more GREEN?” is the **question posed to grades 4-8 students**. The goal is to have the students realize how much is wasted and ways to use it again.

**Assessment** will be based on several factors. **First** there will be a *group assessment*. The class will be divided into groups with four members each. Each group member will be assigned a role for the week (roles will cycle): leader, secretary, researcher, collector. Worksheets with a rubric will be used to keep students on track and will be completed by the group on Friday of each week. All students must participate in Monday's brainstorming session. **Second** there will be an *individual assessment*. At the end of the PBL each student will self- evaluate on how well they think they did in each assigned role. Each student will evaluate themselves on how well they cooperated, followed directions, observed, researched, and followed safety guidelines. Their assessment worksheet will handed into the teacher at the end of the PBL.

**Exemplary performance** will be assessed for students who actively participated in all roles. As a leader, did they keep the group on track, make good decisions, listen to group members? As a secretary did they complete the worksheets neatly and on time, create an eye catching poster, and record data on donations? As a researcher did they listen to group members and find assigned information on time? As a collector did they make and keep appointments with other staff members to collect their donations and deliver them to the assigned parties? A scrapbook containing the research, Friday worksheets, Monday brainstorming session notes, photos of posters, a list of donations and recipients, and a graph depicting donations to recycling centers is created by each group and presented to class.

**Students will be taken on a field trip around the school**. They will be asked to observe things they may never have noticed and take written notes. We will begin at the dumpster and observe how much garbage our school has. Could anything have been reused in the school or recycled to a center. We will

interview the art teacher for supplies she may be collecting for projects. We will interview the cafeteria workers for what is thrown away from food preparation and see if it could be reused. Students can then determine who they may want to interview, what they may collect, how they could reuse etc in a brainstorming session immediately following the field trip. Groups will be assigned. Let the critical thinking begin. **Each Monday** will be check in time and I will sit in on their brainstorming session to determine what they are doing for the week, what their roles are, and give them a worksheet to complete for Friday helping to keep the project on track.

**Each week each group** will need to complete for the **scrapbook**: one interview, a poster asking for specific donations, information on the computer about the donations (can they be recycled or only reused, how are they made, etc), a record of who gave donations and who accepted the donations and the intended use of the donations, and data records for items being sent to the recycling center.

**At the end of the project** each group's scrapbook will be presented to the class. All members need to present some aspect of the scrapbook. As a group they need to determine some type of conclusion summary statement. Then, as a class, a conclusion summary answer to “how can we make our school more GREEN” needs to be discussed. All students can participate in any capacity. Since it is a group project, the teacher will select students and can pair up those who need more guidance with the natural leaders in the class. Cooperative learning is fundamental in this PBL. By having to try different roles, students can stretch and grow through critical thinking and problem solving. The PBL is flexible enough to allow for different learning styles and group leaders for the week may use the learning style where they are most comfortable. Although only planned for four weeks, it has potential for being a year project.

**Note URL below shows 5 to 7 components for a PBL Lessons described at eCollege Units!**

<http://www.itws.org/SampleProjectBasedLearningLessonFormatStepbyStep.pdf>