Lab Framework

Text: Cord
Unit number and title: Unit B, Naming Numbers in Different Ways

Short Description: This is an "early in the year lab" to prove to students that applied math will be different from their previous math classes and it will include fun activities. The students, working with a partner, will make a mobile that represents at least 8 different fractions. If they are successful and make high quality products, they will be given to 2nd and 3rd grade teachers at the nearby elementary school.

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Lab Title
Fraction Mobiles

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**
  1. Students will make fraction representations.
  2. Students will practice and refine measuring skills.
  3. Students will convert fractions to decimals.
- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)
  Use ruler for measurements.
  Work with a partner
  Manage their time
  Divide shapes up into fractional quantities
- **Vocabulary**
  Numerator
  Denominator
  Fraction
  Balance
  Mobile
- **Materials List**
  1. Rulers, scissors, colored paper (2 pieces per student),
  String (4 feet per student), Marking pens
  Large paper clips to keep each student's pieces organized between classes,
  Large envelopes to store each classes work during the lab (1 or 2 per class)
  Wood dowels or similar cross piece material for mobiles (1 per student).
  (Micheals or JoAnne fabrics)
  3. Instruction sheet
  4. Rubric
- **State Standards addressed**
  Math:
  3.3.A Represent fractions that have denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12 as parts of a whole, parts of a set, and points on the number line.

3.3.C Represent and identify equivalent fractions with denominators of 2, 3, 4, 5, 6, 8, 9, 10, and 12.
4.2.D Convert a decimal to a fraction and vice versa, and visually represent the number.

Reading: 2.1. Demonstrate evidence of reading comprehension.
2.2. Read to perform a task.

Writing: 2.2. Writes for different purposes.
2.3. Knows and applies writing conventions appropriate for the grade level.

- **Leadership Skills**
  1.1
- **SCAN Skills/Workplace Skills**
  1.4

Set-up information

In 3rd grade teachers introduce fractions. This is the point where some students struggle with math and their difficulties continue from there. We are going to help those students by making mobiles for their classroom that demonstrate fraction concepts. Then, when they look around the room they will see physical examples of fractions everywhere.

- **Lab organization:** Students will work with a partner
- **Timeline required:** 2-3 days

- **Teacher Assessment of student learning** (scoring guide, rubric)
  Rubric
- **Summary of learning** (to be finished after student completes lab)
  -discuss real world application of learning from lab
  -opportunity for students to share/present learning

- **Optional activities**
  Create a mobile with decimals
  Create a mobile that shows different ways to represent 1/2
- **Career Applications**
  Discussion on what types of jobs do you follow instructions but have some creative say in the product you are manufacturing?

LAB TITLE: Fraction Mobiles
STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**

  You are creating a mobile to represent fractions. Each piece hanging from the mobile must be a regular geometric shape and accurately demonstrate the fraction you have chosen. You will write the fraction neatly in large numbers so the students can see both the written fraction and the colorful representation you chose.

- **Grouping instructions and roles**

  Students will work with a partner.

- **Procedures** – steps to follow/instructions

  1. Choose a partner.
  2. Get a set of written instructions.
  3. Choose at least 8 fractions to represent
  4. Get the day 1 supplies

  Day 1
  Materials: Ruler, scissors, colored paper, large paper clip

  5. Measure and draw your base shapes and cut them out. (Cut all your base shapes out of the same color paper).They do not all need to be the same shape, if you want to have a variety that is fine. All shapes must be regular geometric figures that have been measured and drawn for accuracy.

  NO HAND DRAWN FIGURES!!!!!
  Figures can include squares, equilateral triangles, circles ….

  Day 2

  6. Calculate the size of the shape that represents the fraction you have chosen for that piece. Measure and draw this shape and cut it out. Staple, glue, or tape it to the base piece. Write the fraction in neat, bold numbers on each shape.

  Day 3
  Materials: 2 wood rods, string, tape, scissors, and hole punch (Please share)

  7. Use a whole punch and put a hole at the top of each of your fraction pieces.

  8. Tie string through the hole and attach the pieces to your 2 mobile rods. Be careful to keep your rods balanced so they hang parallel to the ground.

  9. Lab reflection: Answer in complete sentences

  1. What problems did you solve when making your fraction pieces?
  2. How did you choose the shapes?
  3. What problems did you have hanging your pieces on the wood dowels?
  4. How did you solve those problems?
  5. Do you think that hanging your mobile in a 3rd grade classroom will help students understand what a fraction is?

- **Outcome instructions**

Students will produce a mobile that demonstrates 8 different fractions. Each piece will be the result of drawing and measuring and each fractional part will be based on calculations. Students will need to solve problems when it comes to balancing their wood dowels as the add the fraction pieces to their mobile,

- **Assessment instructions** (peer-teacher)

Rubric

Description	4	3	2	1
Fraction pieces	More than 8 complete and to scale. Nice mix of shapes included Numbering is neat	8 pieces drawn appropriately to scale Numbering is neat All parts measured	Pieces are incomplete or there are less than 8 Pieces are not drawn to scale Poor quality numbering	Less than 8 pieces Hand drawn Numbering is messy and or small
Mobile Design	Aesthetics and functionality exceed requirements	Design meets criteria, some creativity evident	Design does not meet criteria and displays a lack of imagination and effort	Design is incomplete
Individual reflection	Thoughtful responses to questions, displays deeper thinking about project	Questions clearly answered, proper grammar and spelling	Does not contain complete sentences Grammar and spelling problems	Incomplete answers, serious grammar and spelling problems

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