Elementary Education Lesson Plan Template
Student Name: Eileen Hernon
Grade Level: 1

Topic: Coordinate geometry
Required for 4881 - **Rationale:** (Why are you teaching these objectives? Why did you select the instructional strategies that you did?)

- Contextualized problems, or word problems, apply mathematic concepts to real-world situations. Not only will this make math more meaningful to students, but it is also most likely how they will really use their math skills/understanding in their lives. Word problems and math stories reassure children that math does not simply exist in the isolation of the classroom. However, in order for students to be successful in employing known math skills and concepts to solve word problems, we have to teach them how to interpret the different types of problems.

Enduring Understandings: (What big idea(s) will students understand as a result of this lesson?)

- We can use addition and subtraction to solve real-world problems

Essential Questions: (What question(s) will students grapple with as they learn through this lesson?)

- How can I use addition and/or subtraction to solve problems I may encounter in my everyday life?

Primary Content Objectives:
Students will **know:** (facts/information)

- Addition problems have you put numbers together
- Subtraction problems have you find the difference between numbers

Students will be able to **do:** (skills and behaviors)

- Identify what word problems are asking them to do
- Represent numbers using counters.
- Use number lines to solve addition and subtraction word problems.

Related state or national standards: (Examples include State Standards of Learning, Common Core State Standards, Next Generation Science Standards or National Curriculum Standards for Social Studies)

- Primary VA SOL: 1.6 The student will create and solve one-step story and picture problems using basic addition facts with sums to 18 or less and the corresponding subtraction facts.
  - Secondary VA SOL: 1.5 The student will recall basic addition facts with sums to 18 or less and the corresponding subtraction facts.
- Primary CCSS 1.OA.A.1: Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
  - Secondary CCSS 1.OA.C.6 :Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

Assessment: (How (and when) will students be assessed? What evidence will you collect to determine whether students have met the lesson objectives? Will the assessment(s) be a pre-assessment (diagnostic), formative (ongoing feedback) or summative?)
- Formative Assessments:
  - Students will be assessed throughout the lesson based on their participation during whole-group instruction.
    - Agree/Disagree: I'll ask students to share their thinking and then engage the rest of the group in a conversation by asking them to show me with their thumbs if they agree or disagree. This will happen when they're sharing their answers and strategies with the whole group.
    - I'll routinely call on students to share their processes and strategies
    - Partner-work: I'll walk around the classroom while the students are tackling problems with a partner. This will give me an idea of the pace at which students are progressing and influence what I bring up in the rest of the lesson and how I plan for tomorrow
  - Students will write their own problem, which will help extend the learning and give me an idea of their understanding of how word problems work. This will happen at the end of the lesson.

Materials and Resources: (List here all materials that you will need in order to successfully teach this lesson. Include technology and website links, texts, graphic organizers, student handouts, physical manipulatives, etc.)
- SmartBoard Notebook presentation
- All students will need an individual number line
- All students will need individual red and yellow counters
- All students will need a piece of scratch paper and a pencil

Key Vocabulary and Definitions:
- Add: put two numbers together

- Subtract: find the difference between numbers

Lesson Procedures:
1. Introduction and goal orientation:
   - "Okay boys and girls, today we're going to be getting more practice with adding and subtracting, but we're going to really focus on *word problems*. We're going to read different math stories and use addition and subtraction to answer questions about them.

2. Connecting to prior knowledge and experiences: (Questions or activities that help students make links)
   a. "Before we do that, though, does anyone want to share a time in their own life when they used addition or subtraction to solve a problem?"
      i. (students may only think about using addition and subtraction in math class and not share a "real world" example. If this is the case, share an experience of your own to model real-world math applications. For example—"Well boys and girls, yesterday I was trying to figure out how many eggs I had to buy at the store. I knew I needed 6 eggs to make breakfast, but I only had 3 eggs. So I had to use subtraction to figure out that I had to buy 3 more eggs. Has anyone had to do something like that?")
         1. If students are really struggling, ask for reminders about what it means to add and subtract—"Okay boys and girls, who can remind me what it means to add? Subtract?"
   b. Students will watch the music video linked in the presentation to reorient them to addition and subtraction. They can get up and dance if they need a wiggle break.
      i. "Here are my friends Annie Addition and Sam Subtraction. They're going to show us a video that will help us remember addition and subtraction. Feel free to sing along and dance if you need to get your wiggles out."

3. Tasks and activities: (What challenging tasks and activities will students engage in as they construct knowledge, learn new skills or behaviors and develop understandings?)
   a. Students will work with a buddy on a "notice and wonder" of a displayed word problem.
      i. "Okay girls and boys, so let's dive right in and look at our first word problem. The problem says, 'Ari has 5 red cars and 3 yellow cars.' Now turn to your table groups and talk about what you *notice* about this problem."
         1. Ideally students will have experience with notice and wonder problems, so they will know the procedure for discussing what they notice with their shoulder partners.

2. If students get tripped up with this, model a "notice."
   a. "For example, I notice that this problem is about a student named Ari. What else do you notice? Tell your partner/"
   ii. Students share out their notices to the whole class. Ideally, at least one student would notice the number and color of the cars. If they don't, teacher can prime them by saying "what do you notice about the cars Ari has?"
      1. Teacher uses counters to concretely represent the cars. Engages student help: "Okay boys and girls, let's use our counters here to show us the kinds of cars Ari has. How would I do that? (wait time—students should be doing it with their own physical counters). Would you like to come up to the board and show us how you used the counters to show the cars? (after student does it, to whole class) Who agrees with that? Who can explain *why* your classmate used the counters that way?"
   iii. "You noticed a lot of interesting things about this problem. Now turn to your shoulder partner and talk about some things you *wonder* about this problem." After a few minutes, students share out their wonders with the whole class.
b. Teacher leads the students in solving the problem with the counters.
   i. "Those are all really great questions to wonder about this problem! So the problem is actually asking: 'How many cars are there all together?' How can we use the counters we used to show the cars to solve this problem? What can we do with these?" (wait time) That's right! We just count them! So we see here that we have 5 red counters to show the 5 red cars, and then there's also 3 yellow counters to show the 3 yellow cars. So let's count together. 1-2-3-4-5-6-7-8. We have 8 cars in all."
c. Teacher leads the students in representationally solving the problem with the open number line.
   i. "Is there another way we could solve this problem using the number line? How would we do that? (wait time). That's right! We'll start on the 5 and then *count on* 3, because that's how many we're adding. Let's count together. 5-6-7-8. So if we count on 3, we land on 8—our answer.
      1. Students may not immediately see how to use the number line, to give them a hint by circling the 5 on the number line and ask why we want to start there.
d. Teacher directly instructs the students on abstractly solving the problem using the traditional algorithm.
   i. "Okay boys and girls, now here's how we would write and solve that problem using a number sentence. We write 5 + 3 (using smart-board

markers). We write 5 and 3 because Ari has 5 red cars and 3 yellow cars. We write "plus" because we're putting the groups together. Remember, when we put groups together it is called *addition,* which uses a plus sign. And we know from our work with the counters and the number line that 5+3=8. Are there any questions?

e. Teacher follows same procedure of concrete-representational-abstract for the additional problem in the brown pull-out tab.
   i. "Okay boys and girls, we are going to look at the same math story about Ari and the cars, but this time, the question is asking us how many *more* red cars Ari has than yellow cars. Let's look at this question with our counters. We're going to keep the counters the same as before, because we're still working with 5 red counters and 3 yellow counters. But this time we have to figure out how many more red ones there are. Take a minute with your shoulder partner to try to work this out. (wait time). Who would like to come up to the board and show us how you and your partner solved this?"
      1. If students are stuck—guide them in the right direction by lining up each yellow counters with a corresponding red counter and asking which ones don't have a buddy.
   ii. "And now let's look at that with our number line. How could we use the number line to see how many *more* red cars there are than yellow cars? (wait time) That's right! We'll count the difference between 3 and 5. Let's start at 3 and see how many spaces we have to travel to get to 5. Count with me 1-2. So there are 2 more red cars than yellow cars"
      1. Some students may prefer to start at 5 and count down. Explain to the students that such a strategy is totally fine!
   iii. "And now let's write that in a number sentence. Does anyone have an idea of what our number sentence will look like? (wait time—if students are confused, just ask what numbers are going to be in the number sentence.) Yep! We'll write 5 -3. We're using subtraction because we want to find the *difference* between 5 and 3, or how many *more* red counters there are.
      1. Students may confuse the order and write 3-5. Remind them that when we want to find out how many *more* there are in a certain group, we want to start with that group.

f. Change slides, read the problem to students. "Does anyone have a guess of what this problem will ask us to do?" (wait time—reveal question). So it is asking us how many they have all together. So now work with your shoulder partners to solve this problem with counters and with your number line. If you finish early, try to write out the number sentence."

    i. While students are working, teacher will walk around the room monitoring students as they work.

    ii. Students may be confused as to whether they should use different colored counters. I will still encourage them to use different colors—one for Maria and one for Seamus. This will help make it easier when they have to do the compare problem.

    iii. Assess students on how comfortable they are using the different modes of representation to solve the problem. They should **all** feel comfortable with concrete. **Most** students should be able to readily use the number line, and **some** students will be comfortable with the abstract representation.

      1. If students are all comfortable with number sentences, focus on number sentences for the rest of the lesson, otherwise, save the bulk of number sentences work for tomorrow

  g. Students share out how they solved the problem.

    i. Students may have trouble determining which sign to use in the number sentence. Remind them that the question is asking how many there are all together between the two groups, so we want to add, which will use a plus sign.

  h. Students repeat same procedure with the compare problem on the brown pull-out tab.

  i. Okay boys and girls, now for the next couple minutes, you're going to write your own word problem and try to stump your shoulder partner with it. So think of a math story in your head. Write it down and share it with your partner. Then, your partner will use either the counters, number line, or number sentence to solve it.

    i. If students are struggling to come up with their own problems, think-aloud model coming up with your own word problem. You can use the egg example from earlier.

4. Closure: (How will you wrap up the lesson and reinforce key ideas? Closure may include some form of assessment or exit slip)

  • I will close out the lesson by calling the students back together as a whole group. "Who came up with a really creative problem they're excited about? What strategies did your group use to solve it? Did any strategy work better than others?" (Take note of which students are properly using which strategies to plan for future instruction.)

  • Thumbs-up activity to check if the word problem is asking us to add or subtract.

    o "Okay boys and girls, now I want you to give me a thumbs-up if this problem is asking us to add, and a thumbs-down if it's asking us to subtract." (Read through the example problems, if more than a quarter of the students get it wrong pause and go over it by asking a student with thumbs down and a student with thumbs up to each explain their thinking)

- "Great work today everyone! Tomorrow, we're going to continue solving word problems, and we're going to try to get faster with them by getting more comfortable using number sentences."