

#### **General Information**

#### **Lesson Parts & Duration**

Total Duration: 1 hour

• Addition and Subtraction within 100: Using Drawings and Equations to Solve Word Problems

# Subject(s)

• Adding & Subtracting within 100 Using Drawings; Compensation Model (2.NBT.B.5)

# Objective

- <u>Students will</u> add and subtract numbers within 100 in the context of one-step word problems using drawings and equations.
- <u>Students will</u> add numbers within 100 in the context of one-step word problems using the compensation model.

#### **Materials**

- blank paper (1-2 pieces per student)
- pencil
- document camera or whiteboard
- **Optional:** printable "Adding & Subtracting Word Problems" (page 7)
- Optional: printable "Break Up Your Day" brain/movement break ideas (page 9)
- Optional: printable "Protocols" (page 8) Used throughout lesson be familiar with each protocol.

# Throughout this lesson, you will find:

- Scripted Text indicates things that need to be said directly. Bullets starting with a "T" followed by italicized type indicate scripted text
- **Clarifiers** within scripted text are in orange
- \* Teacher Directions indicate things you should be doing
- \* Side notes provide helpful hints, ELL strategies, differentiation and information
- Break Up Your Day (Brain/Movement Breaks) are in green boxes (at the end)

#### Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.



#### Instructional Plan: 60 minutes

#### Introduction

- T Today, we are going to be using drawings and equations to represent word problems.
- **T** We will be solving the first problem together as a class and then you will have a chance to solve some similar problems with a partner and then one on your own.
- T Our first word problem is: Maria has 9 happy face stickers. Jonah has 4 star stickers. How many do they have altogether?
- T I want you to think about what math drawings could we make and label to represent the problem?
- *T* What are some ways to represent the quantities?
- T Listen while I reread the problem.
- *T* We will start with the first sentence.
- T "Maria has 9 happy face stickers."
- T What drawing could we make and label to represent this part of the problem? Call on several students to share their idea(s). Possible answer: Draw 9 smiley faces.

**Example:** 

Example:

Maria: 00000000000

Draw and label the pictorial representation suggested by the students for the first sentence.

- **T** Does this make sense?
- T Who can explain why? Call on several students to share their idea(s).
- T Now let's read the second sentence: "Jonah has 4 star stickers."
- T What drawing could we make and label to

Maria: 0000000000

Jonah: ★★★★

represent this part of the problem? Call on several students to share their idea(s). Possible answer: Draw 4 stars.

Draw and label the pictorial representation suggested by the student for the second sentence.

- **T** Does this make sense?
- T Who can explain why? Call on several students to share their idea(s).
- *T* Now that we have drawn a pictorial representation of our word problem, what math operation will we use to write the equation to solve this problem?
- **T** What words in the problem help you to know if we will be adding or subtracting?
- T Let's read the problem again and listen for any clue words.
- *T* Maria has 9 happy face stickers. Jonah has 4 star stickers. How many do they have altogether?
- Turn and tell a person near you if you think we need to add or subtract to solve this problem.
- T Then tell them what you think the clue word is that tells us which operation to use.

Provide about 30 seconds for a quick partner discussion. Monitor conversations to ensure they are on topic.

- T Who would like to share which operation they think we should use and what the clue word was that helped you? Call on several students to share their idea(s). Answer: addition; altogether
- T Okay, (student's name) says addition because of the word "altogether."
- **T** Now we are ready to write an equation.
- *T* Our equation is 9 + 4 =.
- *T* Does this equation seem reasonable?
- *T* I am going to check by reading the word problem again.

**Example:** 

Maria: 00000000000

Jonah: ★★★★

9 + 4 =



- *T* After each sentence, I will put a checkmark over the part of the equation that matches.
- T Maria has 9 happy face stickers. Put a checkmark over the 9 in 9 + 4.
- T Jonah has 4 star stickers. Put a checkmark over the 4 in 9 + 4.
- *T* It looks like our equation matches the problem.
- T Let's try to solve this equation now!
- *T* Most of the time there is more than one way to solve a problem.
- T Who would like to tell me one way we could find the sum of the two numbers? Call on several students to share their idea(s). Possible answers: We could count all the stickers. We could regroup 9 + 4 to (9 + 1) +3.
- *T* Trying to make a ten is one of the easiest ways to add.
- *T* We call this regrouping.
- T My first number is 9; I know that I only need 1 more to make 10.
- T I can regroup (9 + 1), because I added one to 9 I need to take one away from 4, then I will have 3 instead of 4.
- T So, my equation would be (9 + 1) + 3 =.
- T 9 + 1 = 10, plus 3 more is 13.

9 + 4 = 9 + 4 =

Maria: ७७७७७७७७ Jonah: ★★★★ 9 + 4 =

Regroup: (9 + 1) + 3

10 + 3

Pass out either a copy of the "Adding & Subtracting Word Problems" sheet -or- pass out a piece of lined paper and project the problems for students to copy.

# Setting up the Paper

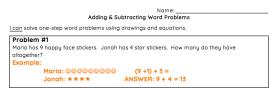
- T Write your name in the top right hand corner of your paper. See example & model so students can follow.
- T You can see that "Problem #1" on your paper is the same as the problem we just solved together.
- *T* I would like you to take a second and show your work on your paper for how we solved this problem. Complete your paper to model what students should be writing.

Provide time for students to fill in the solution to problem #1. Monitor and assist as needed.

- **T** Now I will put each of you in pairs.
- T Remember to always be respectful to whomever you are working with, it is not nice to act unhappy about who your partner is, it can hurt their feelings.

Assign each student to a partner. Make sure to remind students to be respectful to their partners.

- To help us take turns while working with a partner, you will each pick the number 1 or 2.
- T 1's will answer the question first and 2's will respond, making sure that they justify or explain their answer.
- Then you will switch roles and 2's will answer 1's and 1's will make sure 2's justify or explained their answer.
- T Please decide with your partner who is going to be the 1 and who will be the 2.
- Then hold up either the number 1 with your finger or the number 2. Make sure that all students know if they are a 1 or a 2.
- *T* We will be using this as we solve the next few problems.
- *T* Let's all look at Problem #2.
- T It says, "There are 25 chickens in the coop. Farmer Ed placed 14 more chickens in the coop. How many are in the coop now?"
- T What math drawing could we make and label to represent the problem?
- T What are some ways to represent the quantities?



🤼 Ask, Answer, and Justify

respond

respond

 Put students in pairs: have them assign themselves a number 1 or 2

• 1's will ask the question first and 2's will

• Then 2's will ask the question and 1's will

• Roles for number assignments:



- T Listen while I reread the problem.
- We will start with the first sentence.
- There are 25 chickens in the coop. What drawing could we make and label to represent this part of the problem?
- T 1's please turn and tell your partners what drawing you would make to represent this part of the problem.
- Does your partner's answer make sense?
- Who can explain to the class what their partner's idea was and why it made sense? Call on several students to share their idea(s).

#### Share out and check for understanding

- Follow the protocol for Ask and Justify · Ask students to share their response to the
- · Verify that response or conclusion is correct
- If needed, provide clarification

#### Draw and label the pictorial representation suggested by the student for the first sentence.

- Now let's read the second sentence: "Farmer Ed placed 14 more chickens in the coop."
- What drawing could we make and label to represent this part of the problem? Call on several students to share their idea(s).
- T 2's please turn and tell your partners what drawing you would make to represent this part of the problem.
- Does your partner's answer make sense?
- Who can explain to the class what their partner's idea was and why it made sense? Call on several students to share their idea(s).



# Share out and check for understanding

- Follow the protocol for Ask and Justifu · Ask students to share their response to the question
- Verify that response or conclusion is correct
- If needed, provide clarification

# Draw and label the pictorial representation suggested by the student for the second sentence.

- T Now that we have drawn a pictorial representation of our word problem, what math operation will we use to write the equation to solve this problem?
- What words in the problem help you to know if we will be adding or subtracting?
- T Let's read the problem again and listen for any clue words.
- "There are 25 chickens in the coop. Farmer Ed placed 14 more chickens in the coop. How many are in the coop now?"
- 1's please 2's if you think we need to add or subtract to solve this problem.
- Then 2's tell them what you think the clue word was that tells us which operation to use.

#### Provide about 30 seconds for a quick partner discussion. Monitor conversations to ensure they are on topic.

- T Who would like to share which operation they think we should use and what the clue word was that helped you. Call on several students to share their idea(s). Answer: addition; more
- Okay, (student's name) says addition because of the word "more".
- *T* Now we are ready to write an equation.
- T Our equation is 25 + 14 =.
- Does this equation seem reasonable?
- I am going to check by reading the word problem again.
- After each sentence, I will put a checkmark over the part of the equation that matches.



- T There are 25 chickens in the coop. Put a checkmark over the 25 in 25 + 14.
- Farmer Ed placed 14 more chickens in the coop. Put a checkmark over the 14 in 25 +

- It looks like our equation matches the problem.
- T Let's try to solve this equation now!
- 2's please tell 1's one way we could find the sum of the two numbers?





Provide about 30 seconds for a quick partner discussion. Monitor conversations to ensure they are on topic.

- T Who would like to share their idea? Call on several students to share their idea(s). Possible answers: We could count all the pictures. We could regroup to make 30.
- *T* Trying to make another ten is one of the easiest ways to add.
- **T** We call this regrouping.
- *T* My first number is 25; I know that I only need 5 more to make 30.
- T I can regroup (25 + 5) and then I will have 9 left over because 14 5 = 9.
- T So, my equation would be (25 + 5) + 9 =.
- T 25 + 5 = 30, plus 9 more is 39.



Now is a great time to take a break and get students re-energized. See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 9)

#### **Partner Practice**

- T Now I would like you to try to solve the next 3 problems, number 3-5 with your same partner.
- T Make sure that you follow the same process we have been doing as a whole class.
- **T** Read, draw, write an equation, check to be sure your equation is reasonable by rereading the word problem, and last solve.
- *T* Remember to regroup if possible by creating another 10.
- *T* You will need to show your work on your papers.
- T Every problem should have a labeled illustration, an equation, and a solution.
- T Once you and your partner have solved problems 3-5 come and get your answers checked by me.
- **T** You will then solve the very last problem by yourself and I will collect your paper for your teacher to look over.

If there is time at the end, you may want to review the answers from problems 3-5 as a whole class following the same procedure that you did for problems 1 and 2. Answer key found on next page. Do not review problem 6, that is an independent assessment component.

Name: ANSWER KEY

#### Adding & Subtracting Word Problems

I can solve one-step word problems using drawings and equations.

```
Problem #1
Maria has 9 happy face stickers. Jonah has 4 star stickers. How many do they have
altogether?
Example:
         Maria: 0000000000
                                (9 +1) + 3 =
                           ANSWER: 9 + 4 = 13
         Jonah: ****
Problem # 2
There are 25 chickens in the coop. Farmer Ed placed 14 more chickens in the coop. How many
are in the coop now?
00000000000000000 (14)
                (25+5) + 9 =
                ANSWER: 25 + 14 = 39 chickens in the coop
Problem # 3
Mrs. O'Dell's 28 second graders went out to recess. 24 second graders came back to
class. How many were missing?
Going out to recess: @@@@@@@@@@@@@@@@@@@@@@@@
28-24 =
                ANSWER: 28 - 24 = 4 students missing
Problem # 4
There were 10 oranges in the basket. After lunch, there were 22. How many oranges were
added to the basket?
Basket: ••••••• | ••••••• (22 total)
        (10)
                ANSWER: 22 - 10 = 12 oranges added
Problem # 5
Eddie has 8 action figures. Mario has 3 Frisbees. How many toys do they have together?
Eddie: 2222222 (8)
Mario: 999 (3)
                (8 + 2) + 1 =
                ANSWER: 8 + 3 = 11 toys altogether
My sister and I bought 21 balloons at the Dollar Store. When we got home, we only had 15. How
many balloons were we missing?
Dollar Store: •••••••••••••
      Home: •••••••••
                ANSWER: 21 - 15= 6 balloons were missing
```



Now is a great time to take a break and get students re-energized. See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 9)





Name:	
Adding & Subtracting Word Problems	

<u>I can</u> solve one-step word problems using drawings and equations.
Problem #1  Maria has 9 happy face stickers. Jonah has 4 star stickers. How many do they have altogether?
Problem # 2 There are 25 chickens in the coop. Farmer Ed placed 14 more chickens in the coop. How many are in the coop now?
Problem # 3  Mrs. O'Dell's 28 second graders went out to recess. 24 second graders came back to class. How many were missing?
Problem # 4  There were 10 oranges in the basket. After lunch, there were 22. How many oranges were added to the basket?
Problem # 5 Eddie has 8 action figures. Mario has 3 Frisbees. How many toys do they have together?
Problem # 6 My sister and I bought 21 balloons at the Dollar Store. When we got home, we only had 15. How many balloons were we missing?



# Ask, Answer, and Justify

- Put students in pairs: have them assign themselves a number 1 or 2
- Roles for number assignments:
  - 1's will ask the question first and 2's will respond
  - Then 2's will ask the question and 1's will respond
  - The next time 2's ask the question first

# On your feet/ Get ready to meet/ Go and Greet (should take less than one minute)

- Students stand up and put their hand up in the air
- Students find another student that has their hand up to have a "new" partner (and get them moving around)
- Once they are with their new partner, they put their hands down and face the teacher

#### Give one & Get one

- Students share information in Ask & Justify
- Each student in the pair writes down the information shared by their partner
- If the information is already written, a check is put by the information

#### Back to Back and Face to Face

- When in pairs, direct students to stand back to back
- Ask the students to consider the question
- Give students at least a minute to consider their response
- Have them turn face to face
- Follow the protocol for Ask and Justify

#### Share out and check for understanding

- Follow the protocol for Ask and Justify
- Ask students to share their response to the question
- Verify that response or conclusion is correct
- If needed, provide clarification

(Used throughout lesson - be familiar with each protocol.)

Note: Place Protocols under a document camera (if available) as necessary throughout the lessons



# Make sure to "Break Up Your Day!"

These can be used in the middle of a lesson or at the end of your lesson.

Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!

# Break Up Your Day: You're Out of Order!

- Students buddy up and say 5 single-digit numbers out loud.
- The second buddy must repeat the numbers backwards!
- Reverse roles.
- Repeat three times. (example: Buddy 1 says, "My numbers are 5, 3, 6, 7, 1." Buddy 2 says, "Your numbers were 1, 7, 6, 3, 5.")



- Challenge students to write as many multiplication facts as possible in one minute. (example:  $1 \times 2 = 2$ ,  $2 \times 5 = 10$ ,  $3 \times 3 = 9$ , etc.)
- Students trade papers with a shoulder buddy and the buddy counts the correct facts.
- Whoever has the most correct facts may share their facts with the class (if document camera is available) or they simply become the new Count Down Kid!



#### 10 minutes

**FORMATION:** Standing at desks

- Have students begin the day with a series of simple activities lasting 30 seconds or more: jumping jacks, knee lifts, flap arms like a bird, hopping, scissors (feet apart then cross in front, feet apart then cross in back)...
- Follow each activity with a basic stretching movement:
- Reach for the sky runner's stretch
- Butterfly stretch (sit with bottom of feet together)
- Knee to chest, rotate ankles, scratch your back

Hold stretches for 10 - 30 seconds. Repeat a different simple activity followed by a new basic stretch as many times as desired.