

General Information

Lesson Parts & Duration

Total Duration: 2 to 2 ½ hours

- Segment 1: Introduction: Identifying Whole Inches, Half Inches, and Quarter Inches (60 Minutes)
- Segment 2: Measurements Around the Room: Using Whole, Half, and Quarter Inches (40 minutes)
- Segment 3: Showing Whole, Half, and Quarter Units on a Line Plot (45-60 minutes)

Subject(s)

- Measurement & Data: Whole Inches, Half Inches, Quarter Inches, Making Predictions, Gathering Data, Line Plots (3.MD.B.4)

Objectives

- Students will create rulers to use that identify measurement lengths in whole, half, and quarter inches.
- Students will gather and record measurement data using whole, half, and quarter inches.
- Students will make a line plot with a horizontal scale marked off in whole number, half, or quarter units.

Materials

- **Required:** printable “Measurement: Inches, Half Inches, and Quarter Inches” template of rulers (page 21) (Segment 1)
- blank paper
- pencils
- blue, orange, and red crayons, colored pencils, or markers
- objects found around the room for students to measure
- box of crayons
- document camera or whiteboard
- gathered data OR data sample sheet
- **Optional Printable Resources:** “Exit Slips” (page 20), “Student Rulers” (page 19) (needed if students don’t have access to real rulers), “Sample Data Sheet” (page 22) (1 half sheet per student if you are not using data collect from segment 2), “Ms. Smith’s Class Height Data” (page 23) (1 half sheet per student –or– project for students to copy)
- **Optional:** printable “Break Up Your Day” brain/movement break ideas (page 24)

Instructional Setting

- Students should be seated with or near another student for partner work.

Throughout these lessons, 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: Segment 1: 60 minutes

Subject

- Introduction: Identifying Whole Inches, Half Inches, and Quarter Inches

Objective

- Students will create rulers to use that identify measurement lengths in whole, half, and quarter inches.

Materials

- **Required:** printable “Measurement: Inches, Half Inches, and Quarter Inches” template of rulers (page 21) (Segment 1)
- blank paper
- pencil
- blue, orange, and red crayons, colored pencils, or markers
- document camera or whiteboard
- **Optional:** printable “Exit Slip” (page 20) (1 copy per student)

Pass out 1 piece of paper to each student before beginning.

Introduction

T Today we will be marking off on rulers to show measurements to the nearest inch, half inch, and quarter inch!

T Measuring down to a quarter inch allows us to get the most accurate measurement.

T Accurate measurements help us as we collect data and information as mathematicians.

T Can anyone think of a situation where it would be really important to measure correctly?

T Turn and tell a partner sitting near you a time that it would be very important to measure correctly.

Provide about a minute for students to share with a partner. Monitor to ensure students are on task.

T Who would like to share the situation you and your partner discussed? Call on several students.

Setting up the Paper

T Write your name and date in the top right hand corner of your paper. See example & model so students can follow.

T On the top center of your paper, title it “Notes.”

T Underneath your title write our learning target, “I can create a ruler to measure lengths in inches, half inches, and quarter inches.”

T Below this statement, write “Vocabulary”.

T The first vocabulary word we need to know is “length.”

T Who thinks they might know what the word “length” means and can create a definition for the word “length”?

T Turn and tell a partner sitting next to or near you how you would define the word “length.”

Provide about 30 seconds for students to share with a partner.

Monitor to ensure students are on task.

T Now that you all have had the chance to try to define “length,” who would like to share their definition with the class? Call on a few students to share their definitions.

T It sounds like many of you have a very similar definition to mine.

Notes	Name
I can create a ruler to measure lengths in inches, half inches, and quarter inches.	
Vocabulary:	
Length: a measured distance from one end to the other	

- T* Let's define "length" in our "Notes" as: "a measured distance from one end to another."
- T* The next vocabulary word we need to know is "half."
- T* Who thinks they might know what the word "half" means and can create a definition for the word "half"?
- T* Turn and tell a partner sitting next to or near you how you would define the word "half."

Provide about 30 seconds for students to share with a partner.

Monitor to ensure students are on task.

- T* Now that you all have had the chance to try to define "half," who would like to share their definition with the class? **Call on a few students to share their definitions.**
- T* These are some great definitions.
- T* Let's all define this in our "Notes" also.
- T* "A half is one of two equal parts."
- T* So, we now know what the word half means; what does "halves" mean? **Call on several students to answer. Answer: Halves means more than one half.**
- T* The word "halves" is the plural form of half.
- T* Plural means that I have more than one of something.
- T* So, if I told you I had 2 halves, that would really mean I had 1 whole, because 1 half plus 1 half would equal 1 whole.
- T* Our last vocabulary word is "quarter."
- T* Who thinks they might know what the word "quarter" means and can create a definition for the word "quarter?"
- T* Turn and tell a partner sitting next to or near you how you would define the word "quarter."

Notes	Name
I can create a ruler to measure lengths in inches, half inches, and quarter inches.	
Vocabulary:	
Length: a measured distance from one end to the other	
Half: one of two equal parts	
Quarter: one of four equal parts	

Provide about 30 seconds for students to share with a partner. Monitor to ensure students are on task.

- T* Now that you have all had the chance to try to define "quarter," who would like to share their definition with the class? **Call on a few students to share their definitions.**
- T* Again, many of you came up with some great definitions!
- T* Let's define this in our "Notes" now.
- T* A quarter is one of four parts.
- T* You can think of this like money, how many quarters do I need to make 1 dollar. **Call on students. Answer: 4 quarters**
- T* How many quarters do I have, if I have 3 out of 4 parts? **Call on students. Answer: 3 quarters**
- T* How many quarters are in one full inch?
- T* Discuss with a partner near you.

Provide about 30 seconds for students to share with a partner.

Monitor to ensure students are on task.

- T* Who can tell me how many quarters would be in 1 whole inch? **Call on several students to answer. Answer 4 quarters makes one whole inch**
- T* Below the definition of "Quarter" in your "notes" we are going to create our own ruler which measures in whole inches, half inches, and quarter inches.
- T* The last thing we are going to do is create illustrations below our definitions to help us to understand halves and quarters.
- T* I am going to give you a couple of minutes to draw a picture to

Notes	Name
I can create a ruler to measure lengths in inches, half inches, and quarter inches.	
Vocabulary:	
Length: a measured distance from one end to the other	
Half: one of two equal parts	
Quarter: one of four equal parts	
Examples:	
Halves	
Quarters	

show halves and another picture to show quarters.

While students are drawing examples of halves and quarters, pass out ruler templates to each person. These can be found on (page 21) of this document.

T In front of you, you have some blank templates of six inch rulers.

T We are going to use these to practice our measurements.

T Please take out a blue, orange, and red crayon/colored pencil/marker.

T First, write your name in the top right hand corner.

T Can I have a student read the instructions? **Call on a student to read out loud.**

T Therefore, we are going to use our coloring utensils to show each measurement on each of the rulers.

T Which color do I use to indicate or show whole inches? **Call on a student to answer. Answer: Red**

T Which color do I use to indicate or show quarter inches? **Call on a student to answer. Answer: Orange**

T Which color do I use to indicate or show half inches? **Call on a student to answer. Answer: Blue**

T Let's do the first one together!

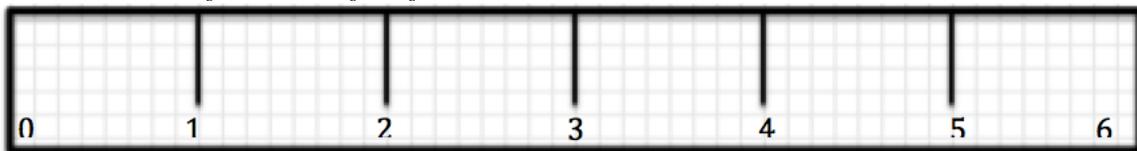
T It says color 3 inches. These are all whole parts, so I'm only going to use my red coloring utensil.

T I have to remember to label all of my parts as well.

T Count with me as I label my inches, starting with 0

T 0 inches, 1 inch, 2 inches, 3 inches, 4 inches, 5 inches and 6 inches **See example & model so students can follow.**

T Now I would like you to label your first ruler as well.



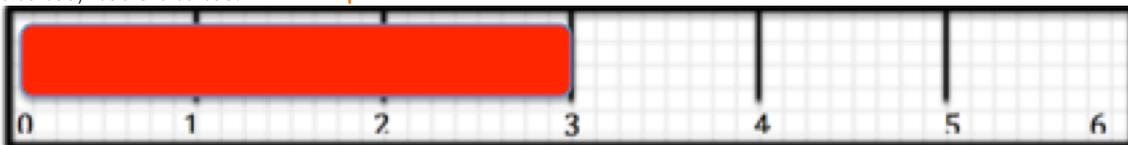
T Since I am measuring three whole inches, I don't need to draw any new tick marks.

T Tick marks are the little lines that you sometimes see in between the whole inches.

T Tick marks help to split whole parts into smaller fractional parts like halves and quarters.

T I can now color in the ruler up to the three-inch line.

T I will stop at the three-inch line because if I were to color one additional part or inch I would have 4 inches, not 3 inches. **See example & model so students can follow.**



Walk around and monitor student coloring. Assist any students who have/are coloring incorrectly.

T Next, we are going to complete ruler number two on our page.

T What is the length we are coloring? **Call on a student to answer. Answer: 2 ¼ inches**

T Correct, it tells us to color 2 and a quarter inches.

T First let's label our whole inches like we did on the last ruler.

T We already know how to label our inches, so let's do that now. **See example & model so students can follow**

T Next, I can label my half inches.

Name: _____

Measurement: Inches, Half inches, and Quarter Inches

Directions: Use the materials below to help color your measurements. Each ruler is split into 6 inches. Use red for inches, blue for halves and orange for quarters. Label all of inch marks. Draw tick marks to identify the half and quarter inches when needed.

1. Color 3 inches



2. Color 2 ¼ inches



3. Color 4 ½ inches using all three colors



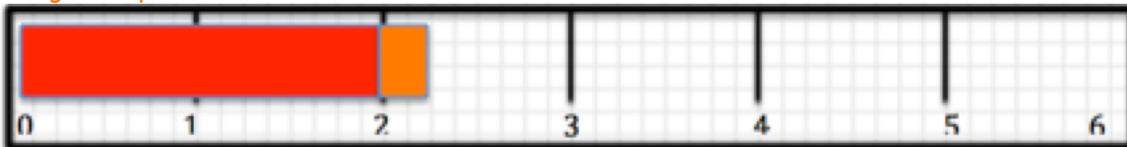
4. Color 5 inches, by coloring 2 ½ inches in two different ways



5. Color 1 ½ inches + 2 ¼ inches + 1 ¼ inches. How many inches did you color in total? _____



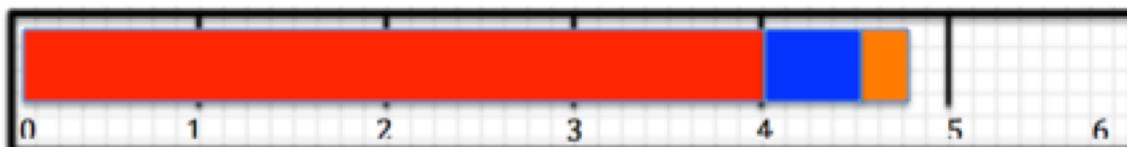
- T* Earlier you helped me define half as “one of two equal parts.”
- T* So, by putting a tick mark in the middle of each inch, we are making two EQUAL PARTS. See example & model so students can follow.
- T* Now, let’s think back to when we defined “quarter.”
- T* A quarter is “one of 4 parts.”
- T* Now looking at our whole inch between 0 and 1, we have already split each inch in half.
- T* To make quarters, I need to go from 2 pieces to 4 pieces.
- T* Can anyone think of how I might do that? Call on students to share their ideas of how to create quarters.
- T* Just like splitting my inches in half, I can do the same with my quarter inches.
- T* If I split each half inch in half, it will turn my whole into how many equal parts? Call on a student to answer. Answer: 4
- T* Correct! Follow along as I do that! See example & model so students can follow.
- T* Now I would like you to do the same on your paper.
- T* What coloring utensils will I need? Call on a student to answer. Answer: Red and Orange
- T* Who can explain to me how to color this? Call on a student to answer. Answer: Color red for two inches. Color orange for 1 quarter inch.



- T* Correct! Watch as I color and then color on your own sheet. See example & model so students can follow. Walk around and monitor students as they color.
- T* Now that you all seem to be getting the hang of it, I would like you to try to complete numbers 3 and 4 with your partners.
- T* Remember that when you are working with a partner, both partners need to be doing equal work.
- T* Sometimes it is easier for you to each try by yourselves and then check to see if you got the same answer.
- T* Be sure to be cautious of all three colors.
- T* I will give you about 7 minutes.
- T* If you finish early, please raise your hand so that I can come and check your work.
- T* If both of your rulers are correct you may create some extra problems on the back of your paper for your partner to try to solve.

Walk around and monitor students as they color. See example for answers to check for understanding. If you check a pair of students and they are incorrect have them try to correct their mistakes.

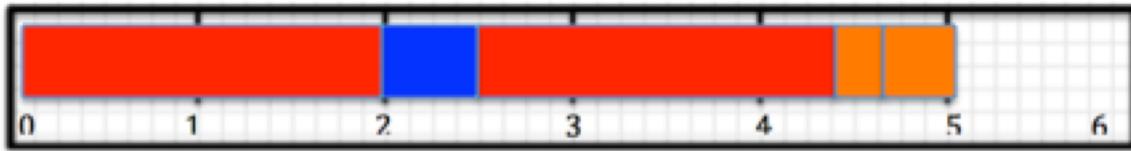
- T* Let’s review our answers.
- T* Who would like to come up and show what they colored for ruler number 3? Call on a student to come to the document camera or the whiteboard to demonstrate their answer for the class.
- T* After our wonderful volunteer shows his/her work I will ask them to explain what they colored and why.



- T* Explain to me how you colored your ruler and why?
- T* Give a thumbs up if you agree with indicate the student’s name’s answer! Wait and observe student’s silent response.
- T* Who would now like to come show us what they colored for ruler number 4? Call on a student to come to the document camera or the whiteboard to demonstrate their answer for the class.

T Explain to me how you colored and why?

*T Give a thumbs up if you agree with **indicate the student's name's** answer. Wait and observe student's silent response.*



T Did anyone do anything different for number 4?

*T Remember, in math there are typically several ways to solve a problem. **Call on a student to share something different.***

T Very nice!

T Now, number 5 is going to be an independent challenge!

T I want everyone to do their best work!

T Do this problem silently, coloring each segment! Then we will share what we have!

T I am going to give you about 5 minutes.

T Please notice there are 3 different measurements that will make up the total answer.

*T Before you begin, let's brainstorm some strategies you might use to solve this problem. **Call on several students.** Answers will vary: adding all of the numbers first and then coloring the answer. Coloring the whole numbers first ($1+2+1= 4$) in red, then coloring the fractions second.*

T Now that you have some ideas of how you might tackle this challenge problem you may begin.

T This problem is very tricky so just try your best.

Differentiation:

Pair struggling students with a partner or pull a small group of students to solve ruler number 5 with your support.

Wait for most students to be finished. Bring the class back together when it appears most have attempted to solve the problem.

T Now let's share!

*T What was the total number of inches you colored? **Call on several students for the answer.** Ask students to show their paper and explain their strategy. Answer: $5 \frac{1}{2}$ inches.*

Optional Assessment Component Exit Slip

You may use the exit slip at the end of this lesson as a quick assessment of student understanding. Either print them out (page 20), or simply have students copy the problems on a half sheet of paper. Answer Key found on next page.

T Last, we're going to complete a few questions independently.

T This is your chance to show your teacher what you have learned.

T Try your best.

T When you're done, raise your hand so that I can collect your paper.

T Then you may read or work on a silent coloring activity.



Make sure to "Break Up Your Day!"

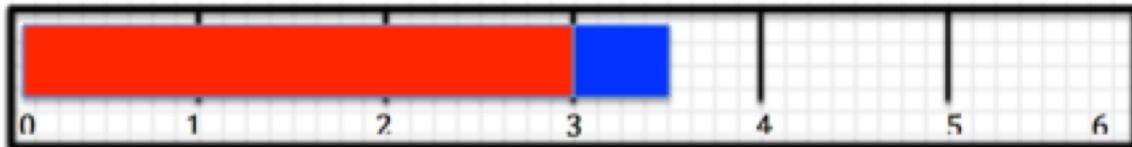


Now is a great time to take a break and get students re-energized. See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 24)

Name: ANSWER KEY

Exit Slip: Segment 1
Measurement: Whole Inches, Half Inches, & Quarter Inches

1. How many halves are in 1 inch? **2 halves**
2. How many quarters are in 1 inch? **4 quarters**
3. How many quarters are in 2 inches? **8 quarters**
4. How many halves are in two inches? **4 halves**
5. Color and label $3\frac{1}{2}$ inches in the ruler below.



Instructional Plan: Segment 2: 40 minutes

Subject

- Measurements Around the Room: Using Whole, Half, and Quarter Inches

Objectives

- Students will gather and record measurement data using whole, half, and quarter inches.

Materials

- blank paper
- ruler –or– use printable “Student Ruler” (page 19)
- box of crayons
- objects to be measured around the room
- pencil
- document camera or whiteboard

Make sure students have either a ruler or a copy of the printable “Student Ruler” (page 19) before you begin.

Introduction

T Now that you all have shown that you can measure accurately, you are ready to start measuring real objects.

T When I say, “Turn and Talk” you’re going to turn to your neighbor and explain to them: Why might someone need to know the measurement of something?

Give time for students to briefly discuss. Monitor and provide assistance as needed.

T Who can share what they and their partner discussed? **Call on students to answer. Answers may vary.**

T Well today we will be measuring objects around the room!

T Let’s start by making some predictions about the length of a box of crayons.

T Turn and tell the person next to or near you what you think the length of this box of crayons is.

Provide 15-30 seconds for students to discuss their predictions. Monitor to ensure conversations are on topic.

T Now, let’s all share our predictions for the length of a box of crayons. **Call on students to share predictions.**

T Those were all some great predictions.

T Who is curious about what the exact measurement of the length of a box of crayons is?

T Ok, let’s measure and see whose prediction was the closest!

Use either a ruler or a copy of the printable “Student Ruler” to demonstrate how to measure the length of a box of crayons. Make sure to demonstrate in a way that all students can see the exact measurement.

T Please watch as I measure this box of crayons.

T Watch very carefully, this first step is the most important to getting an accurate measurement.

T Notice on the ruler that the 0 doesn’t start at the very beginning of the ruler. **This is not true of the student printable rulers. If using a printable ruler reference that this is typically true of rulers they would find.**

T Instead, I need to make sure to line up the object with the 0-tick mark on the ruler. **Model this for students to see the “0” lined up with the bottom of the object.**

T We call all of the lines on our ruler tick marks.

T Once I have lined up my object with the 0, I now need to be sure that I keep my ruler straight and make sure that I do not move the 0 from the bottom of the object.

T Let’s now look and see the length of this box of crayons.

T Who can tell me what the nearest quarter inch reads on the ruler? **Call on a student to read the measurement. Answer may vary based on the box of crayons you are using. Possible answer: $4\frac{1}{2}$ inches.**

Pass out 1 piece of blank paper to each student.

Setting up the Paper

T In a few minutes, you will be able to get up and measure some different objects around our classroom.

T But first, we need to set up our paper to record our measurement data.

T Please, write your name and date in the top right hand corner of your paper. See example & model so students can follow.

T Give me a “thumbs up” when you have finished this step.

T Then below that we will write the title, “Measurements around the Room.” See example & model so students can follow.

T Give me a “thumbs up” when you have finished this step.

T Next, let’s write our learning target, this is what we will be doing during this lesson.

T Our target for today is: “I can gather and record measurement data using whole, half, and quarter inches.” See example & model so students can follow.

T Give me a “thumbs up” when you have finished this step.

T The last thing we will do is draw a table to record the objects we are measuring, our predictions of the length of these objects, and the exact measurement to the nearest quarter inch. See example & model so students can follow.

T The table will have three columns.

T Please draw three columns now. See example & model so students can follow.

T At the top of the first column write “Object.” At the top of the next column, write “Prediction” and for the last column write “measurement to the nearest quarter inch.” See example & model so students can follow.

T Give me a “thumbs up” once you have finished this step.

T Since we have already measured a box of crayons, let’s fill that data into our table as an example. See example & model so students can follow.

T Give me a “thumbs up” when you have finished this step.

T For prediction, please write down what your initial prediction was before we measured.

T Give me another “thumbs up” when you’ve finished that step.

Name & Date		
Measurements around the Room		
I can gather and record measurement data using whole, half, and quarter inches.		
Object	Prediction	Measurement to Nearest Quarter Inch
Example: Box of crayons		$4\frac{1}{2}$ inches

Independent Work

T Now is when you’re going to go around the room and measure objects!

T I want you to measure objects that are all less than six inches.

T You are to measure between 6-10 objects.

T Don’t go OVER ten objects!

T Before you measure each object, write down the name of the object and a measurement prediction.

T Just like what we did with the box of crayons.

T Remember you cannot predict something once you know the actual measurement; so, don’t forget to make a prediction first!

Note:
Pair struggling students with a partner.

- T* Be sure to pick objects that have a straight edge.
- T* When you're done measuring 10 objects, you may help other students.
- T* Who can repeat the instructions back to me? **Call on a student to clarify.** Measure 6-10 objects that are 6 inches or less. Do not measure more than 10 objects. Write the name of the object and then make a prediction. Last, use your ruler to make an exact measurement to the nearest quarter inch.

When students understand instructions, send them off for about 15 minutes to measure objects. Walk around and make sure they are measuring correctly, or suggest objects for them to measure.

Double check their measurements for accuracy. Students who finish early can help other students.

After students have completed their task, call them back to their seats.

Analyzing Findings

- T* We're going to analyze some of our findings under our three-column chart.
- T* You can use the back side of the paper if need be.
- T* We will number each question as we do it.
- T* First, we're going to identify our smallest object.
- T* Let's hear some of your answers!

Circulate during the sharing portion. Help those who struggle with writing.

- T* Turn and tell your neighbor the SMALLEST object you measured.
- T* On your paper, write down "#1: The smallest object I measured is _____ at _____ inches." See example & model so students can follow.
- T* Give me a thumbs up once you've written that sentence.
- T* Now turn and tell your neighbor the LONGEST object you measured.
- T* On your paper write down "#2: The longest object I measured is _____ at _____ inches." See example & model so students can follow.

Measurements around the Room			Name & Date
I can gather and record measurement data using whole, half, and quarter inches.			
Object	Prediction	Measurement to Nearest Quarter Inch	
Example: Box of crayons		4 $\frac{1}{2}$ inches	

1. The **smallest** object I measured is _____ at _____ inches.
2. The **longest** object I measured is _____ at _____ inches.
3. I measured _____ objects 3 inches or less and _____ objects greater than 3 inches, but less than 6 inches.

Circulate during the sharing portion. Help those who struggle with writing.

- T* Give me a thumbs up when you've written that sentence.
- T* Next, we're going to write down our most common measurement and our least common measurement.
- T* Tell your partner which measurement came up the most in your findings and which measurement came up the least.
- T* If it was a tie, be sure to mention that to your partner.

Give time for students to briefly discuss. Monitor and provide assistance as needed.

- T* Now, how many of your objects were 3 inches or less? **Call on students to share.** Answers may vary.
- T* How many of your objects were 3 or more? **Call on students to share.** Answers may vary.
- T* Let's write that in a sentence. **Model as you explain for students to see.**
- T* "_____ objects were 3 inches or less and _____ objects were greater than 3 inches, but less than 6 inches." See example & model so students can follow.
- T* Now turn and tell your neighbor which object measured the most different from your prediction!

- T* Who can raise their hand and share their answer? Call on students to share. Answers may vary.
- T* You guys have done a great job measuring objects around the room!
- T* Go ahead and pass your papers to me!
- T* Make sure you have written your name on your paper!

If you are continuing on to segment 3, please have students keep their papers from segment 2. You will want to collect all papers to leave for their teacher at the end of segment 3.

 **Make sure to “Break Up Your Day!”** 

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 24)

Instructional Plan: Segment 3: 45-60 minutes

Subject

- Showing Whole, Half, and Quarter Units on a Line Plot

Objectives

- Students will make a line plot with a horizontal scale marked off in whole number, half, or quarter units.

Materials

- blank paper
- data from segment 2 –OR– copy of supplied data sheet
- pencil
- document camera or whiteboard
- **Optional Printable Resources:** “Exit Slip” (page 20) (1 copy per student), “Sample Data Sheet” (page 22) (1 half sheet per student if you are not using data collect from segment 2), “Ms. Smith’s Class Height Data” (page 23) (1 half sheet per student –or– project for students to copy)

In this segment, you can use the measurement data from the previous segment “Measurements Around the Room,” or you can show students the data sheet. You can make copies, show the data on the over head or write it on the board

Introduction

T Today we will be showing a data set using a line plot!

T Data is simply information that has been collected.

T I can collect data on all sorts of topics.

T For example, I may collect a data set about the number of people who live with you.

T I would first need to collect that data by asking each of you how many people live with you and write down each answer.

T I would most likely collect this data using some type of a chart, similar to the one we used to collect our measurement data for “Measurements Around the Room.”

T Once I collect all of my data, I typically need to choose some type of a graph to show that data.

T What are some graphs you have used before? Call on students to share. Possible answers: bar graph, line graph, pie chart or circle graph, line plot.

T Today we will be using a line plot.

T Raise your hand if you have heard of seen a line plot before. Scan the room to check for familiarity.

T Can you describe a line plot to me? Call on students to answer. Answers may vary. Example answer: a line plot has numbers on the bottom and counts the number of items going up using x’s.

T A line plot is one way that we organize data to make it easier to understand!

T On a line plot we put the numbers that represent our data points along the bottom.

T So if I were to collect data on how many people we each live with I would need to start with 2 because you live with yourself and at least one parent or adult.

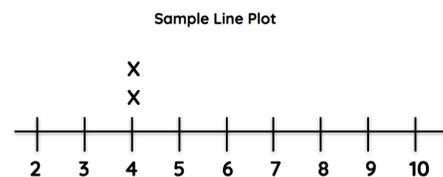
T Then I would continue to list numbers until I got to the greatest number someone lived with, let’s say 10.

T I will draw a straight line and make tick marks, like on the ruler, and below each I will number them 2-10. See example & model so students can follow.

T Then I would put an “x” above each number to stand for someone’s answer.

T For example, when I grew up there were 4 people who lived in my house, me, my brother, my mom, and my dad.

T So, I would put an “x” over the number 4 to stand for my answer.



- T* If someone else had 4 people living in their house as well, I would put an x on top of my x and so on.
T Now that we all know what a line plot is we're going to set up our own line plots!

Pass out blank paper to each student

Setting up the Paper

- T* Write your name and date in the top right hand corner of your paper. See example & model so students can follow.
- T* On the top center of your paper, title it "Notes."
- T* Underneath your title write our learning target, "I can make a line plot with a horizontal scale marked off in whole number, half, or quarter units." See example & model so students can follow.
- T* Let's start by making our number line!
- T* I want to skip a few lines before I start my number line, so I can make space to mark my data!
- T* On our line plot, we are going to only measure objects between 3 and 6 inches long!
- T* So who can tell me how many whole inches are going to be shown on my number line? Call on students to answer. Answer: 4 (3, 4, 5 and 6)
- T* When I start my number line, do I start with a 0, 1, 2 or 3? Call on students to answer. Answer: 3
- T* Correct, I will start with the number 3 because I am showing measurements for items that are 3 to 6 inches only.
- T* Now watch me as I draw my line plot. See example & model so students can follow.
- T* At the end I'm putting a 6 because that's the maximum I want to show.
- T* Who can help me figure out what goes in the middle?
- T* What whole numbers are in between 3 and 6? Call on students to answer. Answer: 4 and 5
- T* Correct 4 and 5 are the whole numbers in between 3 and 6!
- T* I have to split my number line into four total parts.
- T* Watch as I draw mine and then draw your number line the same way that I draw mine. See example & model so students can follow.
- T* Give me a thumbs up when you are done!

Name & Date
Notes
I can make a line plot with horizontal scale marked off in whole number, half, or quarter units.
Measurement Data Around the Room

Monitor and provide assistance as needed.

- T* Am I done creating my number line for our measurements from around the room? Call on students to answer. Answer: No you need the quarter and half inches too.
- T* I can't stop with just whole numbers!
- T* We measured objects to the nearest half and quarter inch!
- T* I will have to put tick marks between each of my whole inch marks! See example & model so students can follow.
- T* These tick marks are like fractions of a whole.
- T* If there are four quarters in one inch, how many tick marks will I put between 3 and 4?
- T* This is tricky think carefully I want to separate the line into 4 pieces, will I draw 4 lines or 3 lines? Call on students to answer. Answer: 3.
- T* Good, 3! When I put three tick marks on a line, I am actually dividing it into four parts!

Name & Date
Notes
I can make a line plot with horizontal scale marked off in whole number, half, or quarter units.
Measurement Data Around the Room

- T** Each inch is made of four parts.
- T** We will label each of these $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$, this is actually the same as if we labeled it $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$, because $\frac{1}{2}$ is the same or equivalent to $\frac{2}{4}$.
- T** Now let's add our quarter marks between each inch on our number line.
- T** Watch and follow along as I mark mine! See example & model so students can follow.
- T** Go ahead and draw 3 tick marks in between each inch on your number line as well.
- T** Give me a thumbs up once you have done this.

Monitor and provide assistance as needed.

- T** How many total tick marks do we have on my number line total now? Call on students to answer. Answer: 17.
- T** That's a lot, isn't it?
- T** You'll see that when we mark our data, we might only place x's above some of these 17 tick marks, but some we may not use none at all, and that's OK!
- T** But, it is important to have all numbers from the minimum which is 3 to our maximum which is 6 even if they are not used to record specific data points.
- T** Now, looking at this number line we just created, what does our number line look like to you? Call on students to answer. Answers may vary. Possible Answer: A ruler.

Activity

You can use either the data that was collected by students or the provided data for this lesson. If you're using the provided data, project or write the data on the board for students to see.

- T** Now we're going to plot some data on our line plot.
- T** We use an "X" as an indicator of "one object" or "one data point."
- T** I know that a crayon box is $4\frac{1}{2}$ inches, so I will put that as my first data point. See example & model so students can follow
- T** Who can give me another measurement of an object? Collect about 3 data points for examples.

Sample Data Sheet

Markers	$6\frac{1}{2}$
Pencils	$6, 4\frac{3}{4}, 6\frac{3}{4}, 6\frac{1}{2}, 6, 5\frac{1}{4}, 5\frac{1}{4}$
Eraser	$2\frac{1}{2}$
Sharpie	$5\frac{1}{2}$
Post-its	3
Crayons	$3\frac{3}{4}, 3\frac{1}{4}, 3, 3, 4\frac{1}{2}, 2\frac{1}{2}, 3, 4, 3\frac{3}{4}, 3\frac{1}{4}, 4, 4\frac{1}{2}, 2\frac{3}{4}, 4$
White board eraser	6
Expo Marker	$5\frac{3}{4}$
Scissors	5
Width of dictionary	$5\frac{3}{4}$
Colored Pencil Box Width	$3\frac{1}{2}$
Label	$2\frac{1}{2}$
Crayon box	$4\frac{1}{2}$

If students did not go around the room to collect data, project the data sheet on the projector and ask students for suggestions from the data sheet or their own sheet.

- T** You are going to finish your line plots by working in small groups of 4!
- T** You each will have lots of different data since everyone measured objects independently before.
- T** You were each supposed to measure 6-10 objects around the room, so that means your final line plot will have 24 to 40 x's, or data points, on it when you are done.
- T** With your group, you're going to combine the data from your sheets to add on to your number line.
- T** Do not worry if members of your team have different measurements for the same item.

Name & Date _____

Notes

I can make a line plot with horizontal scale marked off in whole number, half, or quarter units.

Measurement Data Around the Room

$3 \quad \frac{1}{4} \quad \frac{1}{2} \quad \frac{3}{4} \quad 4 \quad \frac{1}{4} \quad \frac{1}{2} \quad \frac{3}{4} \quad 5 \quad \frac{1}{4} \quad \frac{1}{2} \quad \frac{3}{4} \quad 6$

- T* For example, I may have recorded 5 inches for a pair of scissors and someone else in my group may have recorded $5\frac{1}{2}$ inches for a pair of scissors.
- T* You do not need to go back and re-measure to see who is correct.
- T* Instead you will make an “x” above both 5 inches and $5\frac{1}{2}$ inches on your line plot.
- T* Make sure to keep track of the data you have already recorded on your line plot, I suggest drawing a line through it as you record an x.
- T* You don’t have to plot ALL of your data, but I want you to plot at least 12 data points!
- T* Who can repeat the instructions of this activity back to me? **Call on students to answer. Go through and plot at least 12 of your groups’ total 24-40 data points. Lightly cross off each number as you plot it on your line plot so you know you used it.**

Divide the total number of students by 4. The result will be the number you want students to count off by. For example: $24 \text{ students} \div 4 = 6 \text{ groups total}$. Have students count off by 6. All of the 1’s will be a group, 2’s, 3’s, 4’s, and so on.

- T* I will count you off by **number of groups you will need to make groups of 4.**
- T* When I point to you please say the next number, once someone says **number you are counting off by**, then the next person I point to will be a 1.

Divide students into groups of four by having them get together with the other students who counted the same number as they did.

- T* Now I would like you to find the other members of your group.
- T* Can I please have all of the 1’s bring your paper and pencils and come to work over here. **Point to where you would like them to work.**
- T* Can I please have all of the 2’s bring your paper and pencils and come to work over here. **Point to where you would like them to work.**
- T* Can I please have all of the 3’s bring your paper and pencils and come to work over here. **Point to where you would like them to work.**
- T* Can I please have all of the 4’s bring your paper and pencils and come to work over here. **Point to where you would like them to work.**
- T* Can I please have all of the 5’s bring your paper and pencils and come to work over here. **Point to where you would like them to work.**
- T* Can I please have all of the 6’s bring your paper and pencils and come to work over here. **Point to where you would like them to work.**

Continue until all groups have been assembled and have a place to work.

- T* Now that you are with your group you will need to decide how you would like to take turns to share data points to be recorded on the line plot.
- T* Would you like to have each person share one data point at a time and take turns that way?
- T* Or would you prefer to have one person share all of their data points, and then the next person would share all of their data points, and so on?
- T* Remember you are each creating your own line plot of your groups’ data.

Have them combine their data to make a line plot on their paper. EACH student should be creating their own line plot, even though they are working together. Walk around and circulate to help groups that may be struggling.

Allow about 15 minutes for groups to work.

While students are finishing write the following word problem on the board for the next activity.

Ms. Smith decided to measure the students in her class at the beginning of the school year and at the end of the school year to see how much they grew. She recorded each student’s height in inches next

to their name. She plans to do this again at the end of the year. She would like to analyze the heights of her students and needs to create a line plot to help her compare all of the students.

- T* Let's come back together and complete another line plot together!
- T* We're going to answer some word problems now.
- T* Please draw a line under your line plot. See example & model so students can follow.
- T* Can I have a student read the word problem on the board? Call on a student to read
- T* What is the word problem asking us to do here? Call on a student to answer. Answer: To plot the heights of students in Ms. Smith's class.
- T* How will we determine how many tick marks we need?
- T* Think about what we did for our last line plot, we determined the minimum measurement and the maximum measurement and then included all of the numbers that fell in between those two numbers.
- T* Looking at this data sample, tell a partner next to or near you how many tick marks we should put on our number line and how you know.

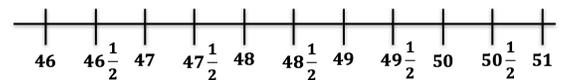
Ms. Smith's Class Height Data

Joyce	$46\frac{1}{2}$	Jason	$46\frac{1}{2}$
Arnav	50	Sherine	46
Kathryn	48	Mateo	$50\frac{1}{2}$
Jesus	$50\frac{1}{2}$	Isaac	51
Christina	50	Gina	46
Arjun	51	Sheila	48
Emmy	$46\frac{1}{2}$	Keyvan	$46\frac{1}{2}$
Charlotte	47	Rachel	$48\frac{1}{2}$
Ashley	$48\frac{1}{2}$	Kristin	46
Malik	$49\frac{1}{2}$	Johnson	$48\frac{1}{2}$
Becca	47	Sharice	49

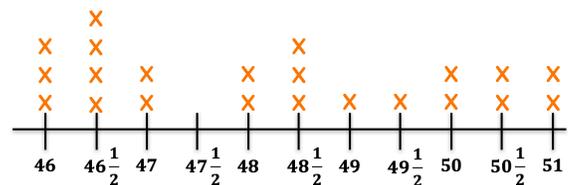
Give a few minutes for students to analyze the data and discuss. Monitor and provide assistance as needed.

- T* Who would like to tell me how many tick marks you think we need and how you determined your answer? Call on a student to answer. Answer: 11.
- T* I can't simply count up how many students because I am not recording the number of students I am recording heights.
- T* So the numbers along my number line on my line plot must be heights.
- T* I notice that these heights are either whole numbers or halves.
- T* Who can tell me what is our minimum height, or the shortest height? Call on a student to answer. Answer: 46 inches.
- T* Now who would like to tell me what the maximum height is in this data set? Call on a student to answer. Answer: 51 inches.
- T* How many whole numbers are between 46, our minimum, and 51 our maximum?
- T* Let's count and see. Count with me: 46, 47, 48, 49, 50, 51.
- T* So, we will need 6 whole numbers on our number line.
- T* Just like on our last line plot, this one includes fractions as well, however I only see halves.
- T* To keep consistent, I will create a tick mark in-between each whole number tick mark to show the half inch. See example & model so students can follow.
- T* Now, with a partner sitting near or next to you, you will each draw another line plot just like the one you just helped me to draw. And you will plot the data points for the heights of students in Ms. Smith's class.
- T* I will come around to help if needed.

Ms' Smith's Class Heights



Ms' Smith's Class Heights



T When you and your partner are done, please raise your hand so I can come and check your answers!

Give students about 7 minutes to complete line plot.

Circulate and help students who are struggling. When students are done, have them read or do a silent activity until all students are finished.

T Having data nicely organized on a graph like a line plot helps us easily see our data and answer questions about it.

T Let's answer some questions about the class heights in Ms. Smith's class!

T How were the students measured, to the nearest what type of inches? **Call on a student to answer. Answer: Nearest wholes and half inches.**

T For which measurement did we find the most children? **Call on a student to answer. Answer: 46 ½- Four students.**

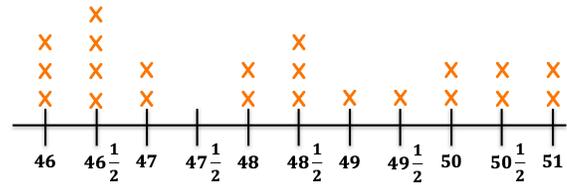
T For which measurement did we find the least amount of kids? **Call on a student to answer. Answer: 47 ½- Zero students.**

T Are there more students that had measurements on a half inch or a whole inch? **Call on a student to answer. Answer: More students measure on a whole inch. There were 12 students with whole measurements and 10 with half measurements.**

T How many students measure 47 inches or taller? **Call on a student to answer. Answer: 15 students.**

T It seems like you guys really got this down!

Ms' Smith's Class Heights



Optional Assessment Component Exit Slip

You may use the exit slip at the end of this lesson as a quick assessment of student understanding. Either print them out (page 20), or simply have students copy the problems on a half sheet of paper. Answer Key found on next page.

T I'm going to have you complete one more problem on your own to show your teacher all that you have learned about creating line plots!

T Please do so silently.

T When you're done raise your hand to let me know and find a book to read!



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 24)

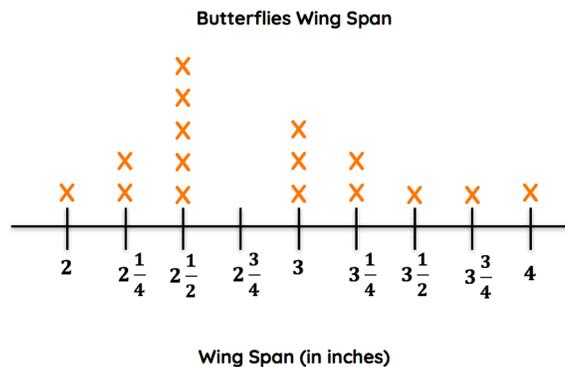
Name: **ANSWER KEY**

Exit Slip: Segment 3
Measurement: Whole Inches, Half Inches, & Quarter Inches

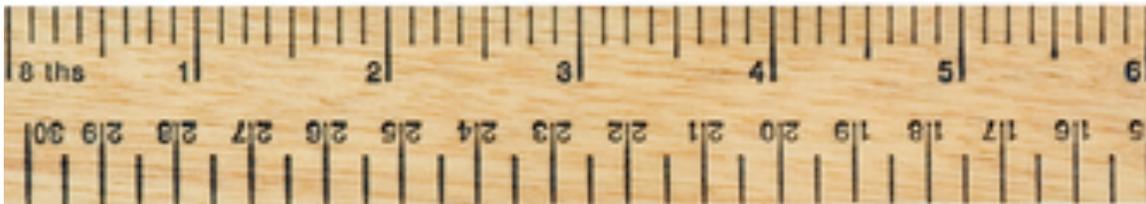
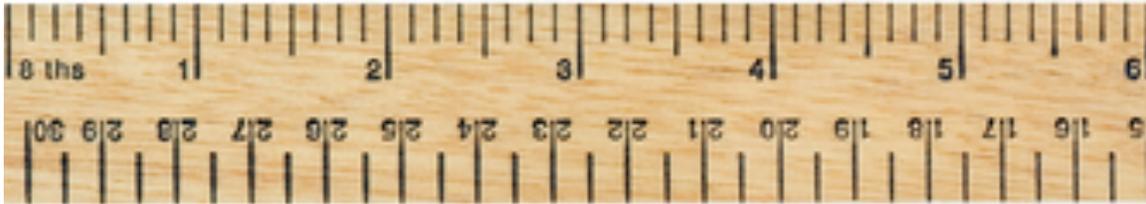
The science lab class is measuring butterflies for their class assignment. Below is a list of butterflies and their wing span. Create a line plot that shows the wing span in inches on the number line, and the butterflies as each data point. Then answer the questions below.

$2\frac{1}{2}$	3	$2\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{4}$	2
3	$3\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{3}{4}$	4	3	$2\frac{1}{2}$	$2\frac{1}{2}$

- How many butterflies were measured in total? **16**
- For which measurement did we find the most butterflies? **$2\frac{1}{2}$**
- For which measurement did we find the least? **$2\frac{3}{4}$**
- How many butterflies measure 3 inches or more? **8**



Printable Student Rulers

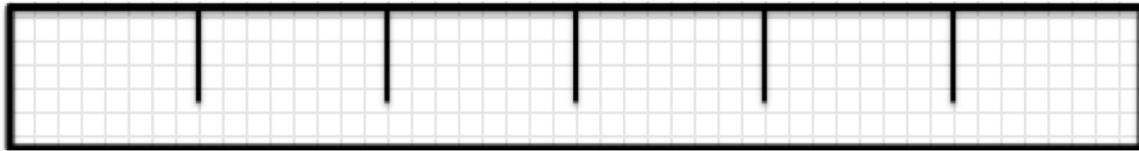


Name: _____ Date: _____

Exit Slip: Segment 1

Measurement: Whole Inches, Half Inches, & Quarter Inches

1. How many halves are in 1 inch? _____
2. How many quarters are in 1 inch? _____
3. How many quarters are in 2 inches? _____
4. How many halves are in two inches? _____
5. Color and label $3\frac{1}{2}$ inches in the ruler below.



Name: _____ Date: _____

Exit Slip: Segment 3

Measurement: Whole Inches, Half Inches, & Quarter Inches

The science lab class is measuring butterflies for their class assignment. Below is a list of butterflies and their wing span. Create a line plot that shows the wing span in inches on the number line, and the butterflies as each data point. Then answer the questions below.

$2\frac{1}{2}$	3	$2\frac{1}{2}$	2	$2\frac{1}{2}$	$3\frac{1}{2}$	3	2
3	$3\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	4	3	$2\frac{1}{2}$	$2\frac{1}{2}$

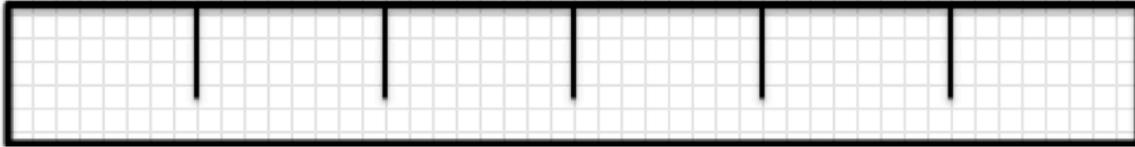
1. How many butterflies were measured in total? _____
2. For which measurement did we find the most butterflies? _____
3. For which measurement did we find the least? _____
4. How many butterflies measure 3 inches or more? _____

Name: _____

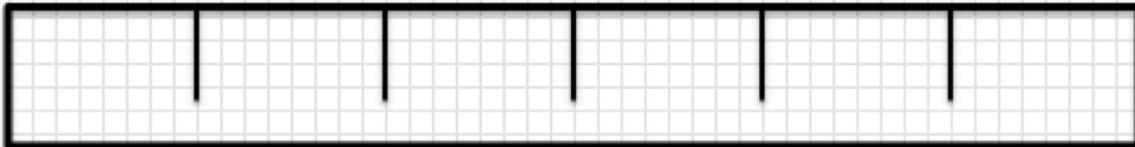
Measurement: Inches, Half Inches, and Quarter Inches

Directions: Use the materials below to help color your measurements. Each ruler is split into 6 inches. Use red for inches, blue for halves and orange for quarters. Label all of inch marks. Draw tick marks to identify the half and quarter inches when needed.

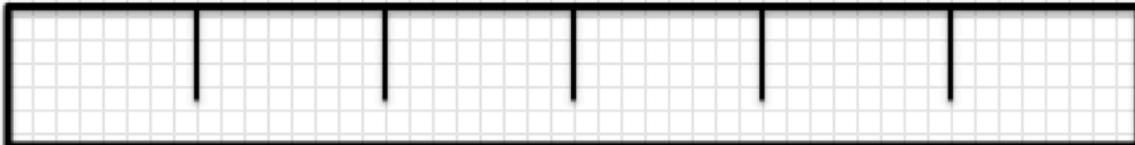
1. Color 3 inches



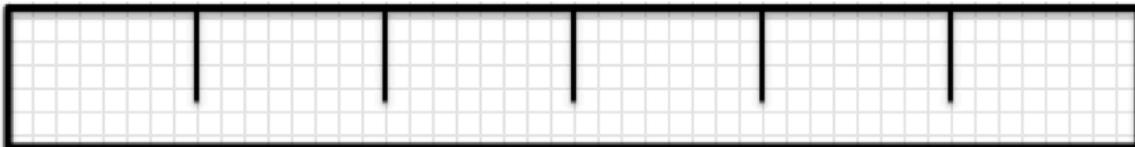
2. Color 2 $\frac{1}{4}$ inches



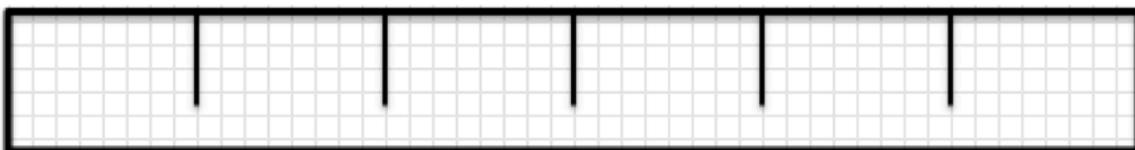
3. Color 4 $\frac{3}{4}$ inches using all three colors



4. Color 5 inches, by coloring 2 $\frac{1}{2}$ inches in two different ways



5. Color 1 $\frac{1}{2}$ inches + 2 $\frac{3}{4}$ inches + 1 $\frac{1}{4}$ inches. How many inches did you color in total? _____



Sample Data Sheet

Markers	$6\frac{1}{2}$
Pencils	$6, 4\frac{3}{4}, 6\frac{3}{4}, 6\frac{1}{2}, 6, 5\frac{1}{4}, 5\frac{1}{4}$
Eraser	$2\frac{1}{2}$
Sharpie	$5\frac{1}{2}$
Post-its	3
Crayons	$3\frac{3}{4}, 3\frac{1}{4}, 3, 3, 4\frac{1}{2}, 2\frac{1}{4}, 3, 4, 3\frac{3}{4}, 3\frac{1}{4}, 4, 4\frac{1}{2}, 2\frac{3}{4}, 4$
White board eraser	6
Expo Marker	$5\frac{3}{4}$
Scissors	5
Width of dictionary	$5\frac{3}{4}$
Colored Pencil Box Width	$3\frac{1}{2}$
Label	$2\frac{1}{2}$
Crayon box	$4\frac{1}{2}$

Sample Data Sheet

Markers	$6\frac{1}{2}$
Pencils	$6, 4\frac{3}{4}, 6\frac{3}{4}, 6\frac{1}{2}, 6, 5\frac{1}{4}, 5\frac{1}{4}$
Eraser	$2\frac{1}{2}$
Sharpie	$5\frac{1}{2}$
Post-its	3
Crayons	$3\frac{3}{4}, 3\frac{1}{4}, 3, 3, 4\frac{1}{2}, 2\frac{1}{4}, 3, 4, 3\frac{3}{4}, 3\frac{1}{4}, 4, 4\frac{1}{2}, 2\frac{3}{4}, 4$
White board eraser	6
Expo Marker	$5\frac{3}{4}$
Scissors	5
Width of dictionary	$5\frac{3}{4}$
Colored Pencil Box Width	$3\frac{1}{2}$
Label	$2\frac{1}{2}$
Crayon box	$4\frac{1}{2}$

Ms. Smith's Class Height Data

Joyce	$46\frac{1}{2}$	Jason	$46\frac{1}{2}$
Arnav	50	Sherine	46
Kathryn	48	Mateo	$50\frac{1}{2}$
Jesus	$50\frac{1}{2}$	Isaac	51
Christina	50	Gina	46
Arjun	51	Sheila	48
Emmy	$46\frac{1}{2}$	Keyvan	$46\frac{1}{2}$
Charlotte	47	Rachel	$48\frac{1}{2}$
Ashley	$48\frac{1}{2}$	Kristin	46
Malik	$49\frac{1}{2}$	Johnson	$48\frac{1}{2}$
Becca	47	Sharice	49

Ms. Smith's Class Height Data

Joyce	$46\frac{1}{2}$	Jason	$46\frac{1}{2}$
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Ashley	$48\frac{1}{2}$	Kristin	46
Malik	$49\frac{1}{2}$	Johnson	$48\frac{1}{2}$
Becca	47	Sharice	49

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: Ball Toss Counting!



- Have students stand in a circle.
- You need a ball or small object to toss like a stuffed animal.
- Teacher stands in the middle of the circle.
- Students count by 1s starting from 1 to 120.
- As everyone counts together, the teacher tosses the ball to a student and the student tosses the ball back to the teacher.
- The teacher will only toss the ball to students who are actively counting and engaged. This will help students stay on task and count out-loud.
- To make it harder, the teacher can say “Stop!” at any number.
- Say a new number and the students have to count on from that number.
- If you stopped at 45, the teacher can say a new number like 54 and students have to pick up from there and say 55.



Break Up Your Day: Body Stretches!



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.



Break Up Your Day: The Wiggles!



- Let’s get our wiggles out before we continue!
- Stand up and shake out your arms (4-5 seconds to shake) Remember! No one should get hurt! ...now FREEZE!
- Now shake the wiggles out of your right leg...FREEZE!
- Now shake the wiggles out of your left leg...FREEZE!
- Now shake all the wiggles out of your whole body...FREEZE!