



# BUILDING INDUSTRY TECHNOLOGY ACADEMY

A program promoted by the  
California Homebuilding Foundation



## UNIT TWO: MEASUREMENT

## **YEAR ONE**

### **UNIT TWO: MEASUREMENT**

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### Lesson #1: Basic Skills Math Diagnostic

#### Objectives

##### Students will be able to...

- Apply the four basic math skills in whole numbers, fractions, decimals, and percentages using real life situations.
- Identify the five major math disciplines used in the construction industry.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

Math Skills Pre-Assessment  
History of Measurement Worksheet

#### Lesson Sequence

- Students will complete the *Math Skills Pre-assessment*. Emphasize this information will be used by the teacher to understand what each student knows now and what needs more practice. Remind students that math is heavily involved with construction.
- When students finish assessment pass out the *History of Measurement Worksheet*.

**Assessment**

Use results of Math Skills pre-assessment to better understand student's current math skills. Supplemental material may need to be added depending on student's current levels of math. Re-teaching math skills may need to follow this lesson depending on student's skill levels.

**Accommodations/Modifications**

Multiplication Chart may need to be provided.  
Calculator may need to be provided.

**Math Skills Pre-Assessment**

Directions: Circle the correct answer.

1. Round 5856 to the nearest hundred.

A. 58  
B. 586  
C. 5800  
D. 5900

2. 
$$\begin{array}{r} 609 \\ \times 57 \\ \hline \end{array}$$

A. 34,713  
B. 4,876,263  
C. 552,483  
D. None of these

3.  $5173 \div 64 =$

A. 8 r20  
B. 808 r20  
C. 880  
D. 880 r20

4. Raul has a small business. On Monday his cash receipts were \$348.16. On Tuesday he took in a total of \$419.23 but paid bills totaling \$689.00. Wednesday through Friday, his receipts totaled \$1872.89. What was his net profit for the next week?

A. \$1183.89  
B. \$1951.28  
C. \$1959.28  
D. None of these

5. Sonia received the following scores on six tests: 78, 85, 82, 91, 76, 88. What was Sonia's average score? (Round off to nearest whole number.)

A. 80  
B. 82  
C. 83  
D. 89

6. Darrell worked for a construction supply company. He received a shipment of 8456 grommets, which needed to be repackaged into smaller packages of 48 grommets. How many packages was he able to fill using the new shipment?

- A. 175
- B. 176
- C. 177
- D. None of these

7. Reduce  $20/24$  to the lowest terms.

- A.  $5/6$
- B.  $5/7$
- C.  $10/17$
- D. None of these

8.  $35/15$  as a mixed number would be:

- A.  $2 \frac{1}{3}$
- B.  $2 \frac{1}{5}$
- C.  $2 \frac{5}{3}$
- D. None of these

**Math Skills Pre-Assessment** *Answer Key*

1. D

2. A

3. B

4. B

5. C

6. B

7. A

8. A

## Short History of Measurement

Directions: Working with a partner read the following statements concerning the history of our modern measurement terms. Clues to solving each statement are contained within each statement and the measurement vocabulary can be found in the Word Bank below.

yard	inch	cubit	kerosene	acre
hand	foot	metric system		tobacco

1. This measurement of approximately 4 inches is still used to calculate how tall a horse is. It is the \_\_\_\_\_.
2. Tired of relying on the length of the previous king's girdles in determining the length of this unit of measurement, Henry the First decreed: "Henceforth, the \_\_\_\_\_ shall be the distance from the tip of my nose to the tip of my thumb."
3. The most common unit of measurement in the United States, the Romans referred to it as "one-twelfth of a foot." It roughly equals the width of a person's thumb, but since 1959, the \_\_\_\_\_ has officially equaled 2.54 centimeters.
4. In 1812, Napoleon noted that the French people were still clinging to traditional units of measurement; even though the \_\_\_\_\_ was officially adopted by the French government in 1795. This system of measurement originally derived its name from the Greek word "metron", meaning "measure". Today it is also known by the initials SI, or System International, and was legalized in the United States in 1866.
5. The \_\_\_\_\_ is one of the earliest known units of measurement. It was the standard unit of measurement for thousands of years in many civilizations, though it has widely gone out of popular use today. Archeologists tell us that this unit of measurement was 18 inches long, or approximately the distance from a person's elbow to the tip of their middle finger.
6. This unit of measurement is one of the few that is the same length in England as it is in America. Originally known as "a third of an ell," it was twelve thumbs in length to the ancient Romans. Today it is known as the \_\_\_\_\_.
7. This plowman's unit of measurement was historically determined by how much land a man with a yoke of oxen could plow in a day. Today the \_\_\_\_\_ officially contains 43,560 square feet.
8. Though these units of measurement would get you nowhere in 99.9% of the world today, on the tiny island of Togo in the South Pacific the \_\_\_\_\_ tin, and the \_\_\_\_\_ tin are distinctive units of measurement that are still in use.



### Lesson #2: Standard Measurement

#### Objectives

##### Students will be able to...

- Use standard units in determining given lengths using a tape measure.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

Ruler/tape measure  
YouTube Video <https://www.youtube.com/watch?v=89NU3iefcAM>  
Reading Fractions on a Ruler Worksheet  
Practice Worksheet-Identify Standard Measurements

#### Lesson Sequence

- Discuss the answers from History of Measurement Worksheet from yesterday. Point out the lack of standard for each measurement. (10 minutes)
- **Reading fractions on a Ruler Worksheet**-students will need to have a ruler or tape measure for this activity.
- Watch the **YouTube video** <https://www.youtube.com/watch?v=89NU3iefcAM>. This video will show students the fraction of a ruler/measuring tape. (9 minutes)
- Pass out worksheet **Reading Fractions on a Ruler Worksheet**. Do this worksheet together-model a few problems and then have students complete the rest on their own. Review all together. (10 minutes)

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- Have students complete *Practice Worksheet-Identify Standard Measurements* independently. (20 minutes)
- Collect worksheets before students leave class.

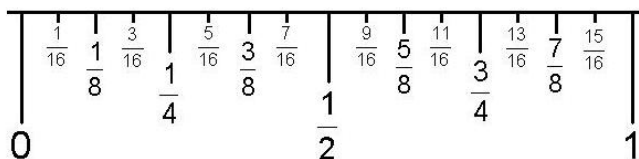
### **Assessment**

Review Practice Worksheet-Identify Standard Measurement to see if students are understanding the concept or if they need more practice.

### **Accommodations/Modifications**

Check student understanding.  
Check in with students 1 on 1.  
Provide Visuals as needed.

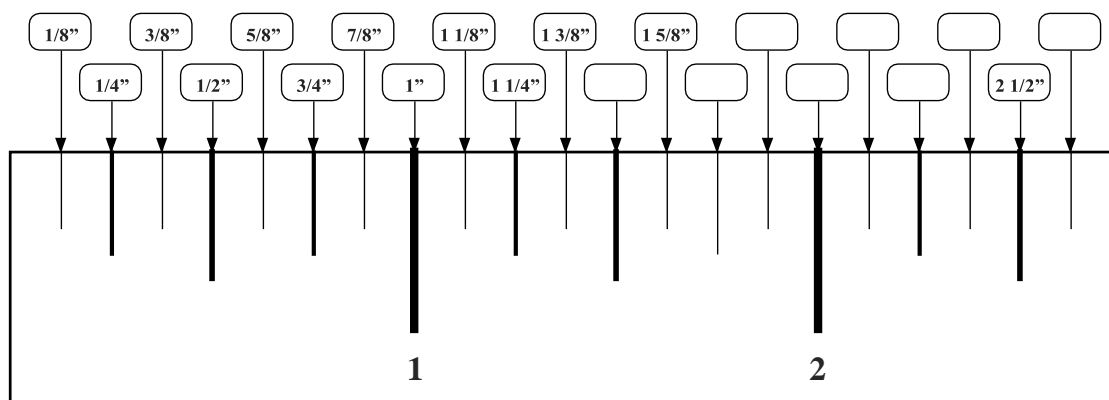
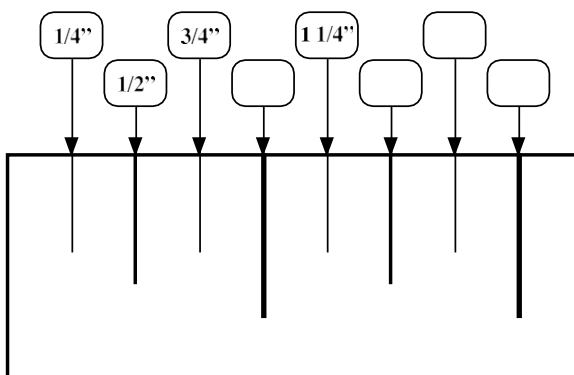
## Reading Fractions on a Ruler



TIP #1: The best thing to do is to memorize the lines. There really aren't that many when you figure that you already know 1/4", 1/2" and 3/4".

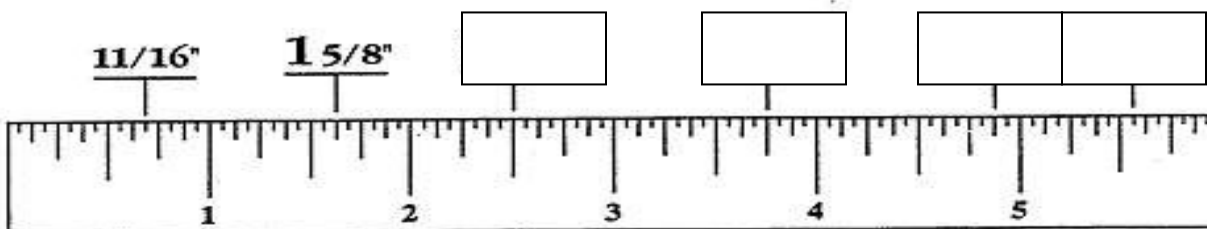
TIP #2: When in doubt, just count the lines (don't count zero), put your answer over 16 and reduce if you can.

TIP #3: The biggest complaint I hear from employers is that their new workers can't read a tape. **YOU CAN DO IT!!!**

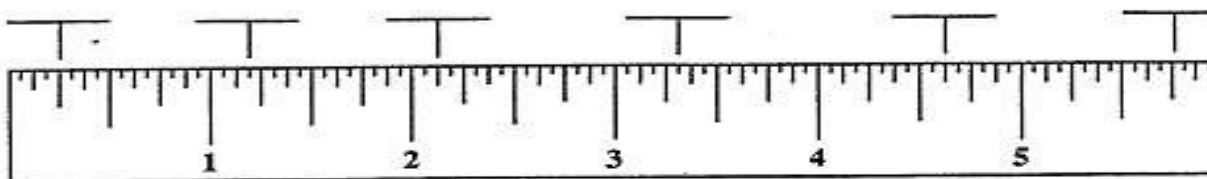


### Identifying Standard Measurements

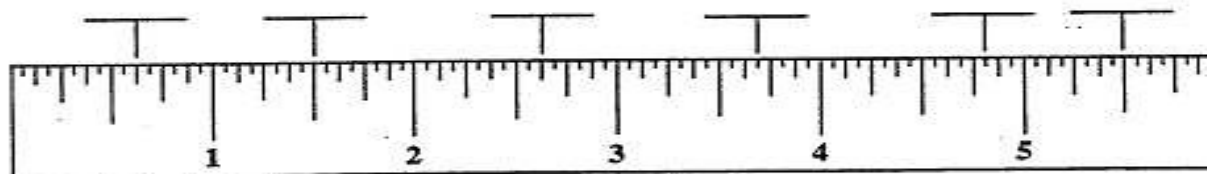
Directions: Write the measurement that corresponds with each indicator.



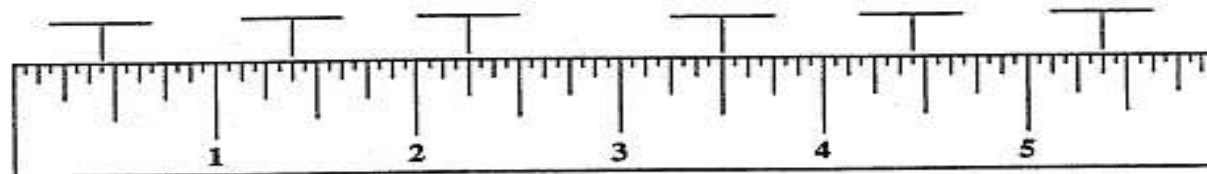
1.



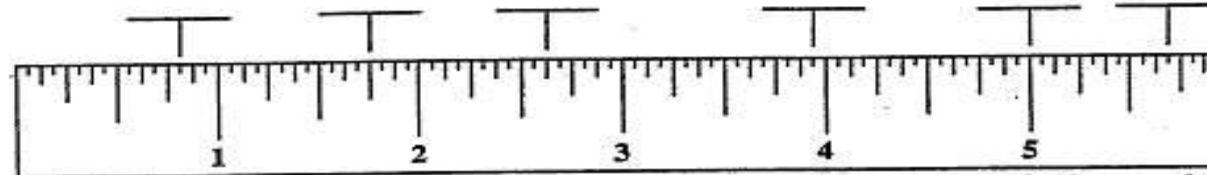
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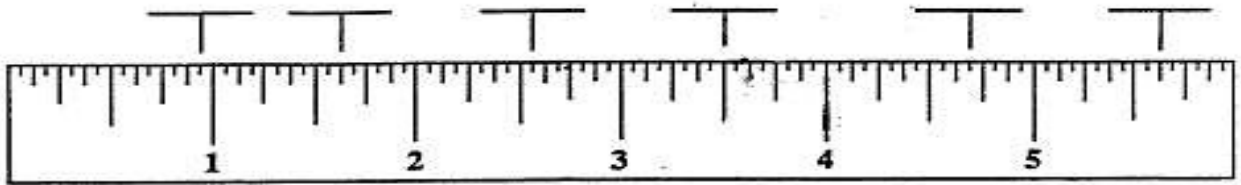
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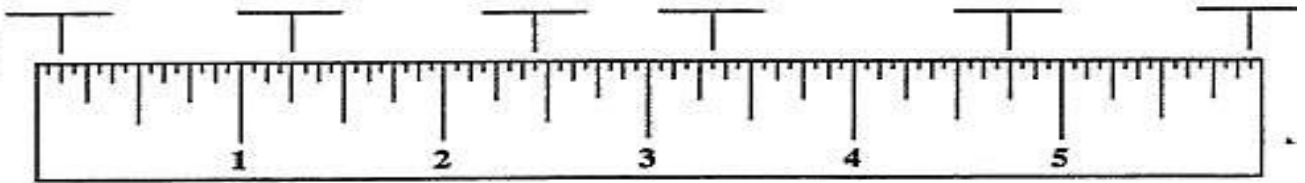
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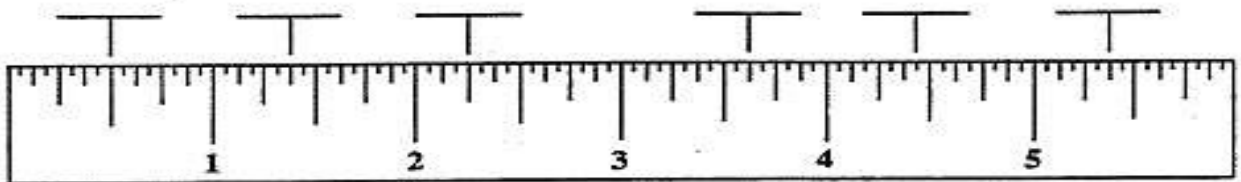
5.



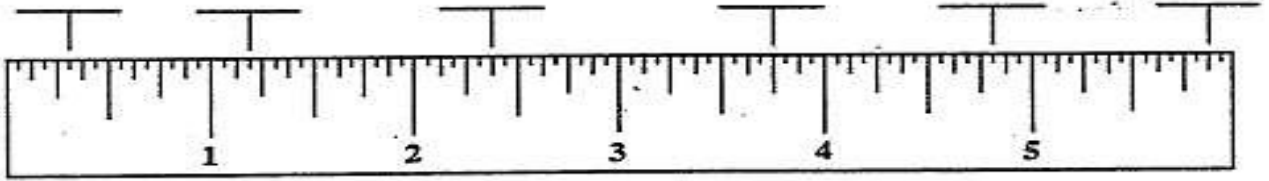
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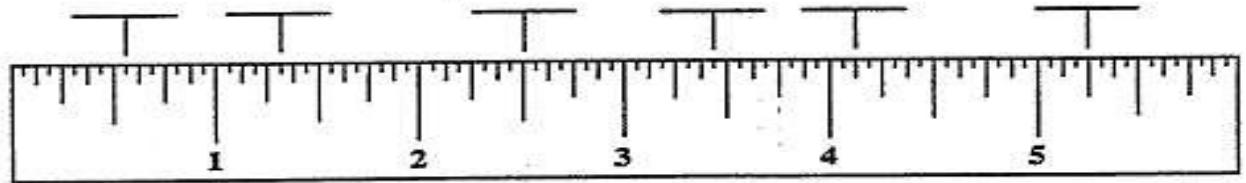
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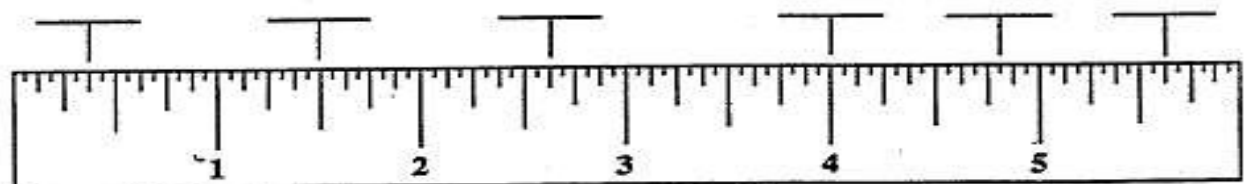
8.



9.



10.



### Lesson #3: Measuring with a Ruler

#### Objectives

**Students will be able to...**

- Use both standard units in determining given lengths using a ruler.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

Reading Fractions on a Ruler Tips  
YouTube Video [https://www.youtube.com/watch?v=88HC07E\\_uhg&feature=youtu.be](https://www.youtube.com/watch?v=88HC07E_uhg&feature=youtu.be)  
Reading a Tape Measure Worksheet  
The Inch worksheet

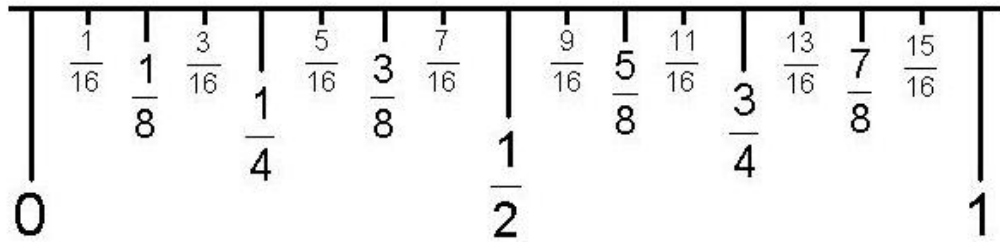
#### Lesson Sequence

- Review yesterday's practice worksheet-Identify Standard Measurements (10 minutes)
- ***Review Reading Fractions on a Ruler Tips.*** (5 minutes)
- Watch the YouTube video  
[https://www.youtube.com/watch?v=88HC07E\\_uhg&feature=youtu.be](https://www.youtube.com/watch?v=88HC07E_uhg&feature=youtu.be) (3 minutes)
- Complete ***The Measuring Standard Measurements*** worksheet by measuring the lines and recording the answers. Compare answers as a class and support students as needed. (10 minutes)
- Have students complete ***The Inch Worksheet*** independently. Collect before students leave class.

Assessment
Use scores from the Inch worksheet to see if students are grasping the concept.

Accommodations/Modifications
Visuals Check for understanding 1 on 1 support

## Reading Fractions on a Ruler



**TIP #1:** The best thing to do is to memorize the lines. There really aren't that many when you figure that you already know 1/4", 1/2" and 3/4".

**TIP #2:** When in doubt, just count the lines (don't count zero), put your answer over 16 and reduce if you can.

**TIP #3:** The biggest complaint we hear from employers is that their new workers can't read a tape measure. You can do it!



## Measuring Standard Measurements

Directions: Using the Standard side of your ruler, measure the following lines. Write each measurement in the space provided.

1) \_\_\_\_\_



2) \_\_\_\_\_



3) . \_\_\_\_\_



4) \_\_\_\_\_



5) \_\_\_\_\_



6) \_\_\_\_\_



7) \_\_\_\_\_



8) \_\_\_\_\_



9) \_\_\_\_\_



## The Inch Worksheet

Directions: Measure the following lines using your ruler. Record the length above the line.



### Lesson #4: Decimals

#### Objectives

**Students will be able to...**

- Understand the importance of decimals in construction and how it is linked to the metric system by using meters, centimeters, and millimeters.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1

Cabinet Making and Wood Products Pathway 1.4

#### Materials

Decimals Notes and Practice

Conversion Chart

Decimals Exit Ticket

#### Lesson Sequence

- Review the *Decimal notes and practice* with the class. There are practice problems within the notes to work out together and practice as a class. (35 minutes)
- Pass out the *Conversion chart* and review with students. (5 minutes)
- *Decimals Exit Ticket*. (10 minutes)

#### Assessment

Review scores on the decimal exit ticket. Use this data as a tool to see which students are grasping the concept and which students may still need support.

#### Accommodations/Modifications

Calculator

One on one support

Peer support

## Decimal Notes and Practice

### What is a decimal?

The decimal notation is the writing of numbers in a base-10 numerical system.

A decimal is a fractional part of a whole number.

There are two types of decimal numbers:

1. Proper decimals contain no whole numbers. The number .375 is an example of a proper decimal.
2. Mixed decimals contain both whole numbers and decimal numbers. 4.25 is an example of a mixed decimal.

### Place Value

Decimals are expressed as follows:

.1	= Tenths
.01	= Hundredths
.001	= Thousandths
.0001	= Ten-thousandths
.00001	= Hundred-thousandths
.000001	= Millionths

The monetary system of the United States is based on the **decimal system**:

CURRENCY	VALUE	DECIMAL	FRACTION
Dollar	\$1.00	1.00	100/100
Half-dollar	\$ .50	.50	50/100
Quarter	\$ .25	.25	25/100
Dime	\$ .10	.10	10/100
Nickel	\$ .05	.05	5/100
Penny	\$ .01	.01	1/100

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### **Reading Decimals**

Orally, decimals are described in different ways. The *correct* way to say a decimal is to read the number and add the correct "th" word to signify place value.

Example: .75 is spoken as "75 hundredths", but on the job you may hear it spoken as "point seven five" or "point seventy-five."

Mixed decimals can be described the same way. Read the whole number. Then read "and" for the decimal point and then read the decimal, stating the place value. The *correct* way to read 3.14, for example, is to say 3 and 14-hundredths. But on the job you may hear it spoken as "three point one four" or "three point fourteen".

Write out the following decimals *correctly*:

1. .65

---

2. .065

---

3. .0065

---

Write the correct way to say the mixed decimal 9.25 in the space provided below:

---

### **Converting Decimals to Fractions**

Any decimal can be converted to a fraction.

Step 1: Write the decimal as a fraction by writing the number divided by the place value.

Examples:  $.25 = 25/100$        $.07 = 7/100$        $.7 = 7/10$        $.125 = 125/1000$

Step 2: Find a common factor, if any, for the numerator and denominator

**Convert the following proper decimals into fractions:**

1. .5 \_\_\_\_\_

3. .625 \_\_\_\_\_

2. .25 \_\_\_\_\_

4. .75 \_\_\_\_\_

Mixed decimals are converted the same way. The only difference is that you ignore the whole number and simply convert the decimal.

For example:  $1.75 = 1^{75/100}$ .  $75/100 = \frac{3}{4}$ . So,  $1.75 = 1 \frac{3}{4}$ .

How did we get from 1.75 to  $1 \frac{3}{4}$ ?

Step 1: Ignoring the whole number, determine any common factors that the numerator and the denominator share.

The numbers 75 and 100 share 25 as a common factor.

Step 2: Divide the numerator and the denominator by 25.

Step 3: This leaves us with the fraction  $\frac{3}{4}$ . Since 3 and 4 have no common factors, they cannot be reduced any further. Therefore, .75 = the fraction  $\frac{3}{4}$ .

Step 4: Add the whole number back to the fraction ( $1 \frac{3}{4}$ ) and you're finished.

**Convert the following mixed decimals into mixed fractions:**

1. 1.5 \_\_\_\_\_

2. 32.375 \_\_\_\_\_

3. .125 \_\_\_\_\_

Just as any decimal can be converted to a fraction, any fraction can be converted into a decimal.

In order to convert a fraction to a decimal, all you have to do is divide the numerator by the denominator. The quotient will be in decimal form.

For example:  $7/8 = .875$  How did we get from  $7/8$  to .875?

Step 1: Divide the numerator (7) by the denominator (8):  $7/8$  Step 2:  $7/8 = .875$

**Convert the following proper fractions into decimals:**

1.  $1/2$  \_\_\_\_\_

3.  $1/16$  \_\_\_\_\_

2.  $3/8$  \_\_\_\_\_

4.  $8/20$  \_\_\_\_\_

Mixed fractions are converted the same way. Ignore the whole number and convert the fraction. For example:  $3\frac{3}{4} = 3.75$  How did we get from  $3\frac{3}{4}$  to 3.75?

Step 1: Ignoring the whole number, divide the numerator (3) of the fraction by the denominator (4):  $\frac{3}{4}$

Step 2:  $\frac{3}{4} = .75$

Step 3: Add the whole number back to the fraction (1.75) and you're finished.

**Convert the mixed fractions into mixed decimals:**

1.  $22\frac{21}{32}$  \_\_\_\_\_

2.  $4\frac{9}{16}$  \_\_\_\_\_

3.  $17\frac{4}{8}$  \_\_\_\_\_

\*\*It is important to note that in the construction industry, we typically round all decimals to the hundredths place. This means that the decimal .725 would round up to .73, and the decimal .724 would round to .72

### **A Final Note on Decimals**

Decimals can also be categorized 3 ways.

1. **Irrational Numbers:** These are decimals that never stop, they just keep going on randomly forever. An example of this is  $3.142857 \dots \infty$  This is the type of decimal you get when you convert the fraction  $3\frac{1}{7}$ . (For calculator purposes, we say it is 3.14)
2. **Repeating Decimal:** A decimal that repeats itself over, and over, forever. An example of this is  $.09090909090909 \dots \infty$  This is the type of decimal you get when you convert the fraction  $\frac{1}{11}$ .
3. **Terminating Decimal:** A decimal that eventually comes to an end. An example of this is .5 This is the type of decimal you get when you convert the fraction  $\frac{1}{2}$ .

It is important to note that both the repeating and terminating decimals are rational numbers. What are rational numbers? Rational numbers are numbers that can be expressed as the quotient of two integers. What are integers? Integers are whole numbers that can have a positive (+) or negative (-) sign attached to them.

**Conversion Chart**

<u>Fraction</u>	<u>Decimal</u>	<u>Millimeters</u>	<u>Fraction</u>	<u>Decimal</u>	<u>Millimeters</u>
1/64	.0156	0.396	33/64	.5156	13.096
1/32	.0312	0.793	17/32	.5312	13.493
3/64	.0468	1.190	35/64	.5468	13.890
1/16	.0625	1.587	9/16	.5624	14.287
5/64	.0781	1.984	37/64	.5781	14.684
3/32	.0937	2.381	19/32	.5937	15.081
7/64	.1093	2.778	39/64	.6093	15.478
1/8	.125	3.175	5/8	.625	15.875
9/64	.1406	3.571	41/64	.6406	16.271
5/32	.1562	3.968	21/32	.6562	16.668
11/64	.1718	4.365	43/64	.6718	17.065
3/16	.1875	4.762	11/16	.6875	17.462
13/64	.2031	5.159	46/64	.7031	17.859
7/32	.2187	5.556	23/32	.7187	18.256
15/64	.2343	5.953	47/64	.7343	18.653
1/4	.250	6.350	3/4	.750	19.050
17/64	.2656	6.746	49/64	.7656	19.446
9/32	.2812	7.143	25/32	.7812	19.843
19/64	.2968	7.540	51/64	.7968	20.240
5/16	.3125	7.937	13/16	.8125	20.637
21/64	.3281	8.334	53/64	.8281	21.034
11/32	.3437	8.731	27/32	.8437	21.431
23/64	.3593	9.128	55/64	.8593	21.828
3/8	.375	9.525	7/8	.875	22.225
25/64	.3906	9.921	57/64	.8906	22.621
13/32	.4062	10.318	29/32	.9062	23.018
27/64	.4218	10.715	59/64	.9218	23.415
7/16	.4375	11.112	15/16	.9375	23.812
29/64	.4531	11.509	61/64	.9531	24.209
15/32	.4687	11.906	31/32	.9687	24.606
31/64	.4843	12.303	63/64	.9843	25.003
1/2	.500	12.700	1	1.000	25.400



### Decimals Exit Ticket

Convert the mixed fractions into mixed decimals:

1.  $2 \frac{5}{8}$  \_\_\_\_\_

2.  $4 \frac{3}{16}$  \_\_\_\_\_

3.  $15 \frac{6}{9}$  \_\_\_\_\_

Convert the following mixed decimals into mixed fractions:

1. 5.87 \_\_\_\_\_

2. 68.93 \_\_\_\_\_

3. 3.33 \_\_\_\_\_

Convert the following proper decimals into fractions:

1. .72 \_\_\_\_\_

2. .675 \_\_\_\_\_

3. .29 \_\_\_\_\_

4. .97 \_\_\_\_\_

### Lesson #5: Reading a Metric Ruler

#### Objectives

**Students will be able to...**

- Read a metric ruler in both millimeters and centimeters.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

YouTube video <https://www.youtube.com/watch?v=GbOu0d18mSg>  
Rulers  
Identifying Metric Measurement-Centimeters worksheet  
Identifying Metric Measurement-Millimeters worksheet

#### Lesson Sequence

- Watch the ***YouTube video*** <https://www.youtube.com/watch?v=GbOu0d18mSg>  
Answer any questions the students may have. (12 minutes)
- Pass out rulers and ***Identifying Metric Measurement-Centimeters Worksheet***. Complete the first couple of problems together and then assign the rest of the problems for students to complete independently. Correct all together after most students are done. (20 minutes).
- Pass out ***Identifying Metric Measurement-Millimeters Worksheet***. Complete the first couple of problems together and then assign the rest of the problems for students to complete independently. Correct all together after most students are done. (20 minutes).

Assessment
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Roam around the classroom while students are working independently. Ask students clarifying questions. Support students one on one as needed. Check for understanding by calling on random students when correcting worksheet as a class.
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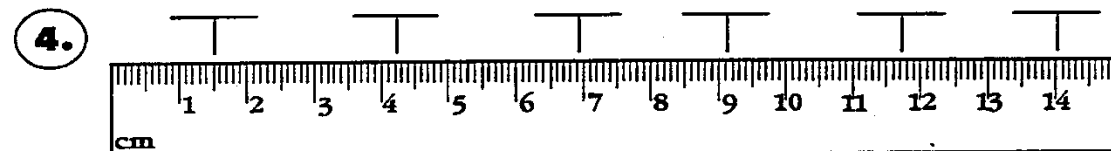
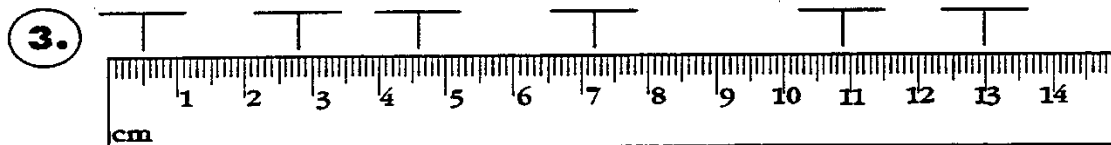
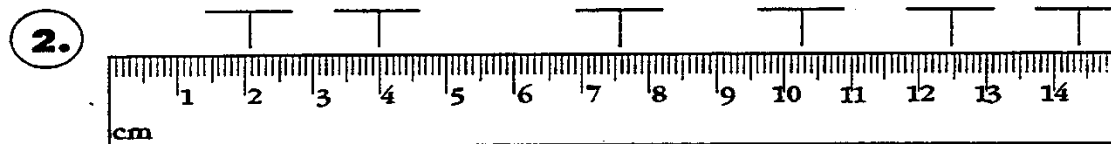
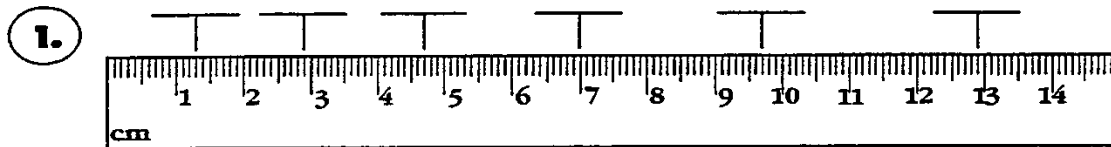
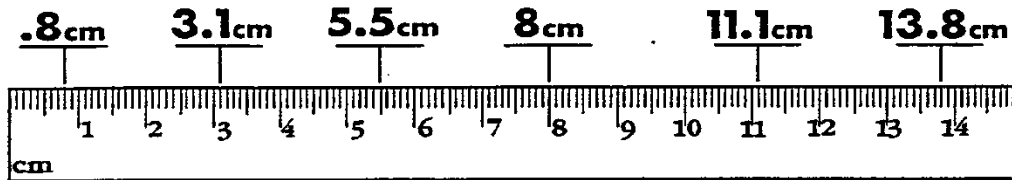
Accommodations/Modifications
------------------------------

One on one support Peer support
------------------------------------

## Identifying Metric Measurements-Centimeters

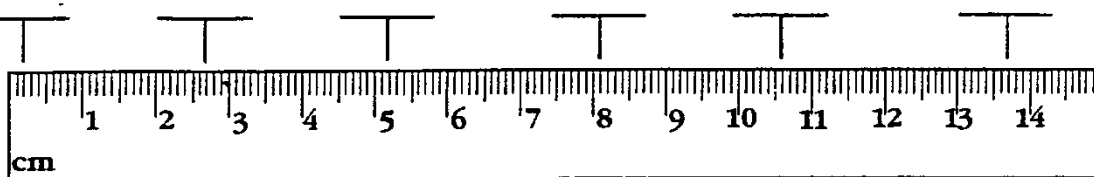
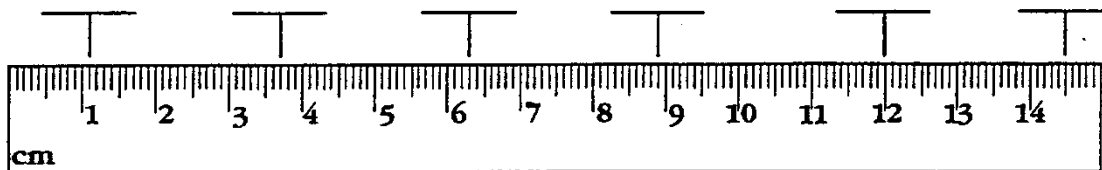
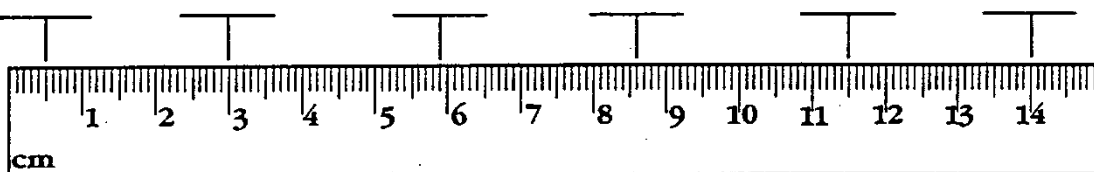
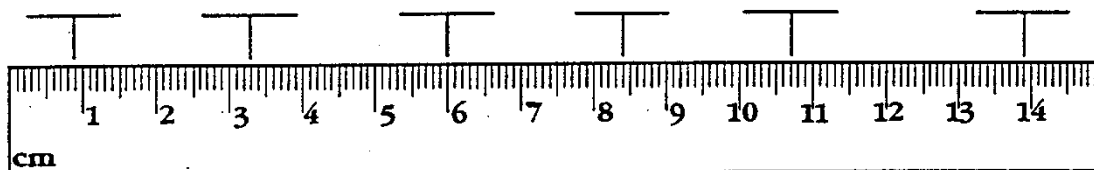
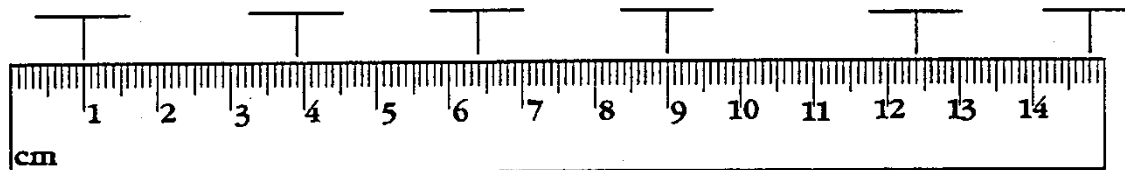
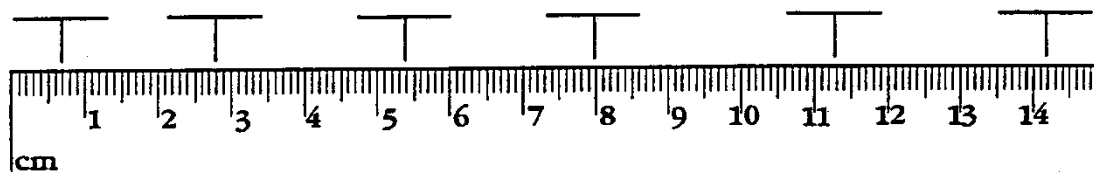
Directions: Write the measurement, in centimeters, that corresponds with each indicator.

### EXAMPLE



**Identifying Metric Measurements-Millimeters**

Directions: Write the measurement, in millimeters, that corresponds with each indicator.

**5.****EXAMPLE****1****2****3****4****5**

### Lesson #6: Measuring Assessment

#### Objectives

**Students will be able to...**

- Show their understanding of reading a ruler and reading a metric ruler.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

Warm-up: Measuring Metric Practice  
Reading a Ruler Assessment  
Reading a Metric Ruler Assessment

#### Lesson Sequence

- Pass out the *Warm-up: Measuring Metric Practice*. Have students work on this and then review it together as a class. (15 minutes)
- Review any questions students may have on reading a ruler and reading a metric ruler. (5-10 minutes)
- Pass out *Reading a Ruler Assessment*. (10-15 minutes)
- As students finish assessment, collect and pass out *Reading A Metric Ruler Assessment*. (10-15 minutes)

**Assessment**

During warm up- roam the room and check in with students who may have clarifying questions or need some assistance.

Grade both assessments and assess which students have mastered the concept.

**Accommodations/Modifications**

Check for understanding

One on one assistance

Visuals

## Measuring Metric Practice

Directions: Using the Metric side of your ruler, measure the following lines in centimeters. Write each measurement in the space provided.

<b>EXAMPLE</b>
----------------

**8.5cm**



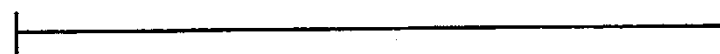
**1.** \_\_\_\_\_



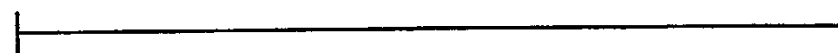
**2.** \_\_\_\_\_



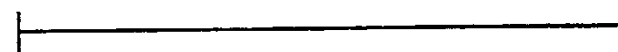
**3.** \_\_\_\_\_



**4.** \_\_\_\_\_



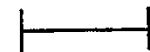
**5.** \_\_\_\_\_



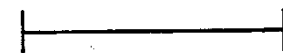
**6.** \_\_\_\_\_



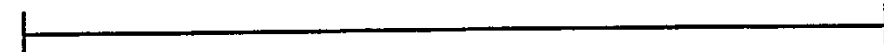
**7.** \_\_\_\_\_



**8.** \_\_\_\_\_



**9.** \_\_\_\_\_



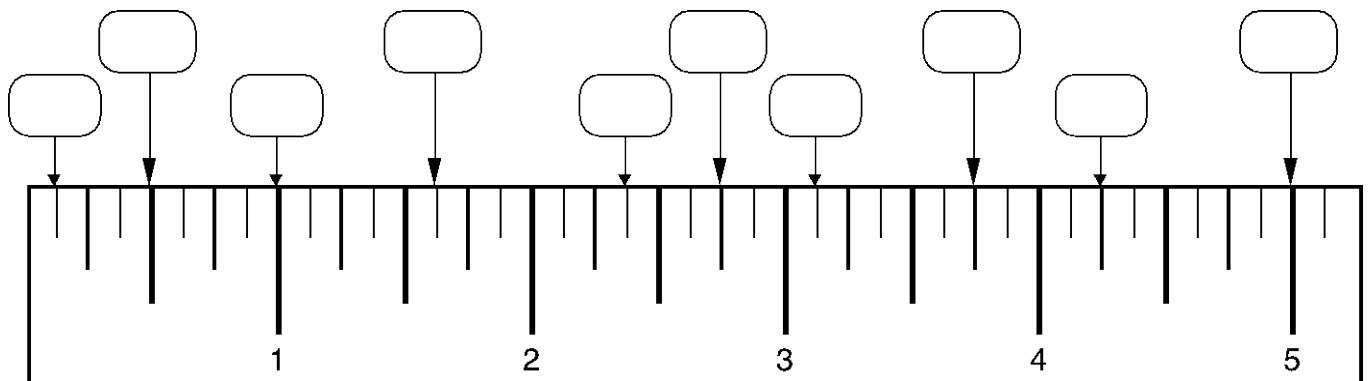
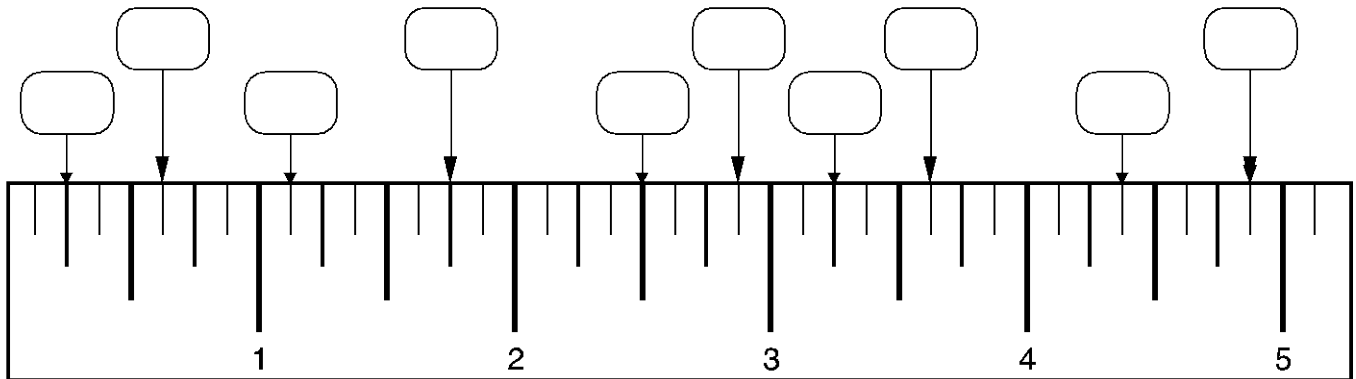
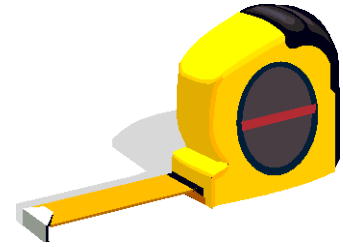
**10.** \_\_\_\_\_





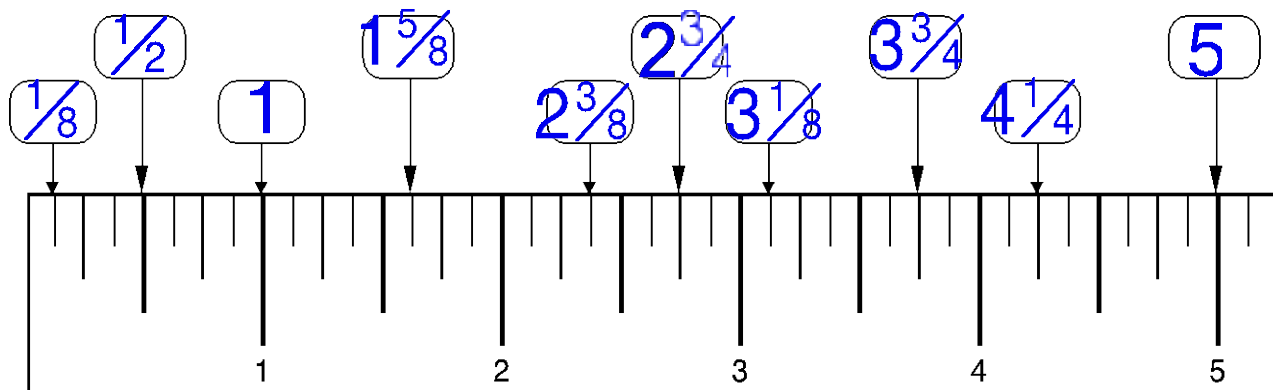
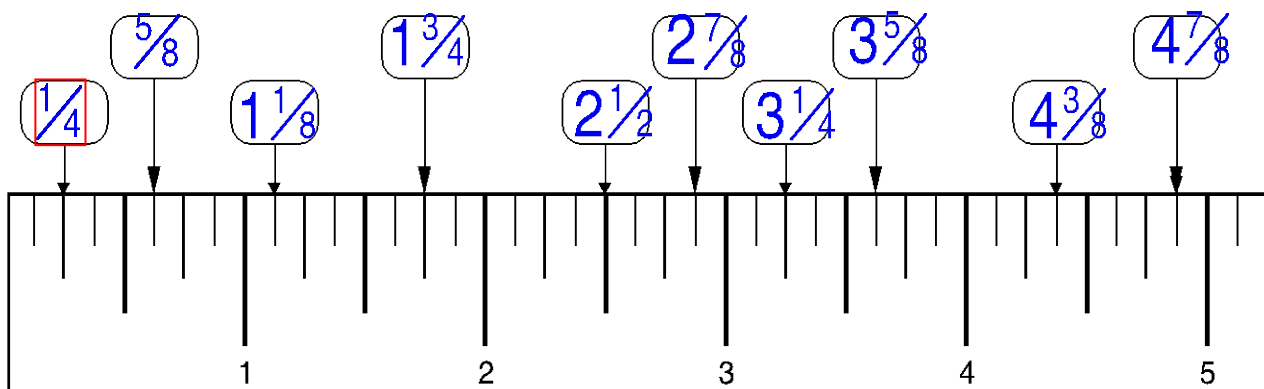
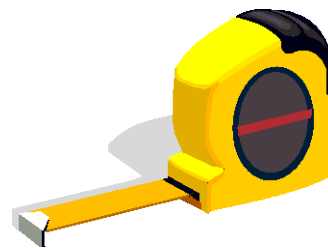
## Reading a Ruler Test

Fill in the boxes with the correct fractional number.



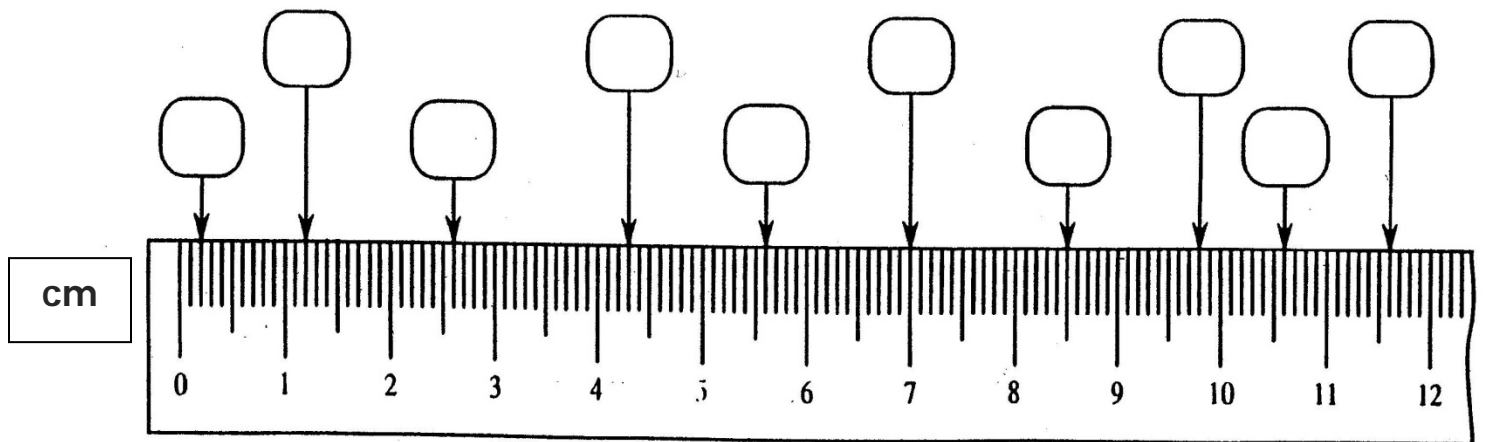
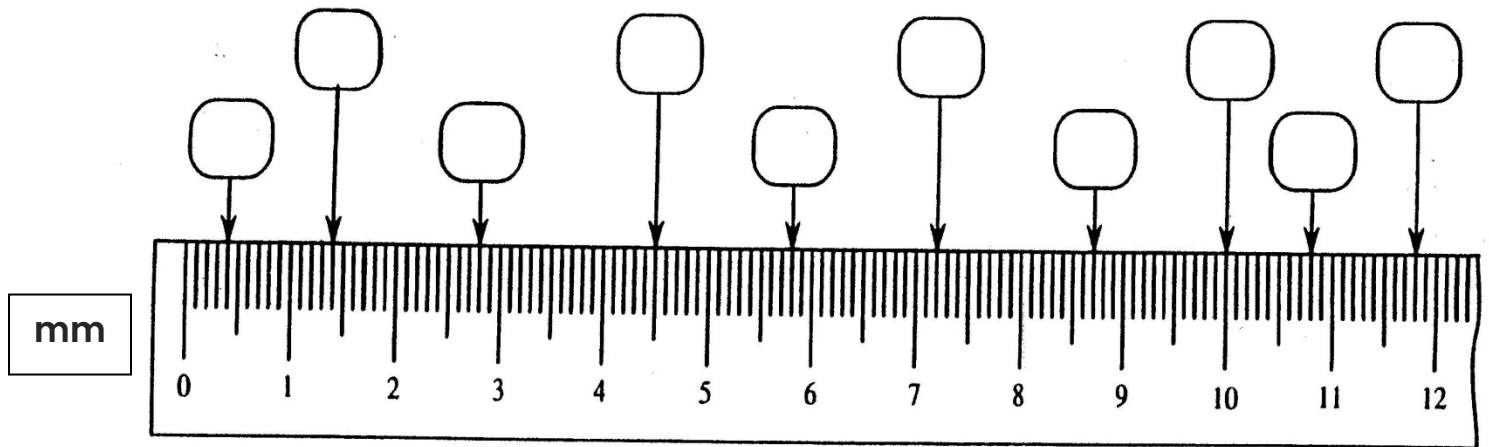
**Reading a Ruler Test** *Answer Key*

Fill in the boxes with the correct fractional number.



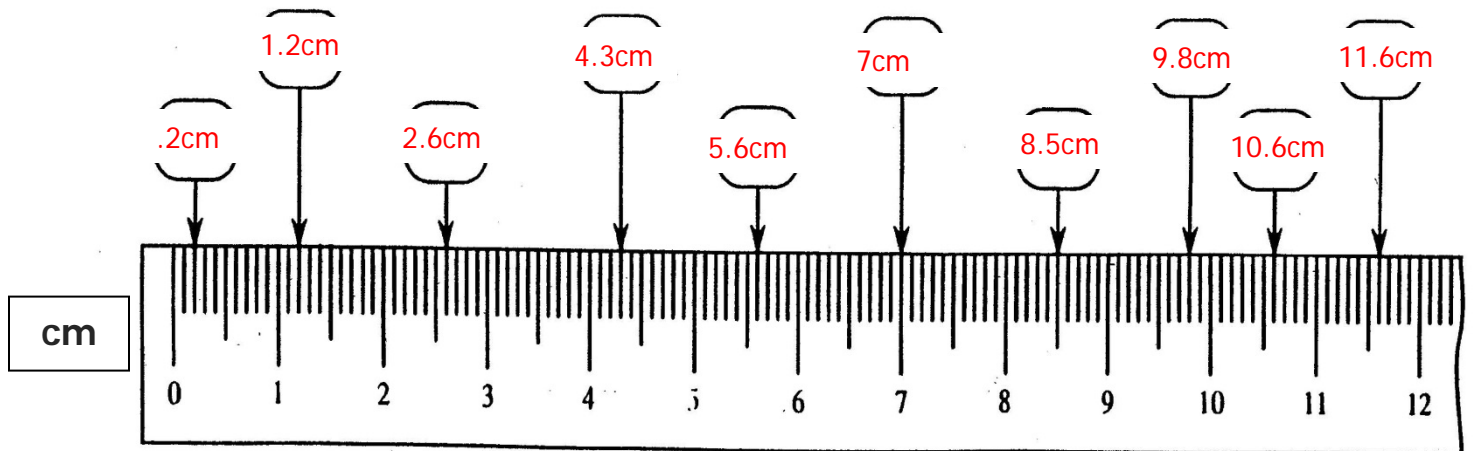
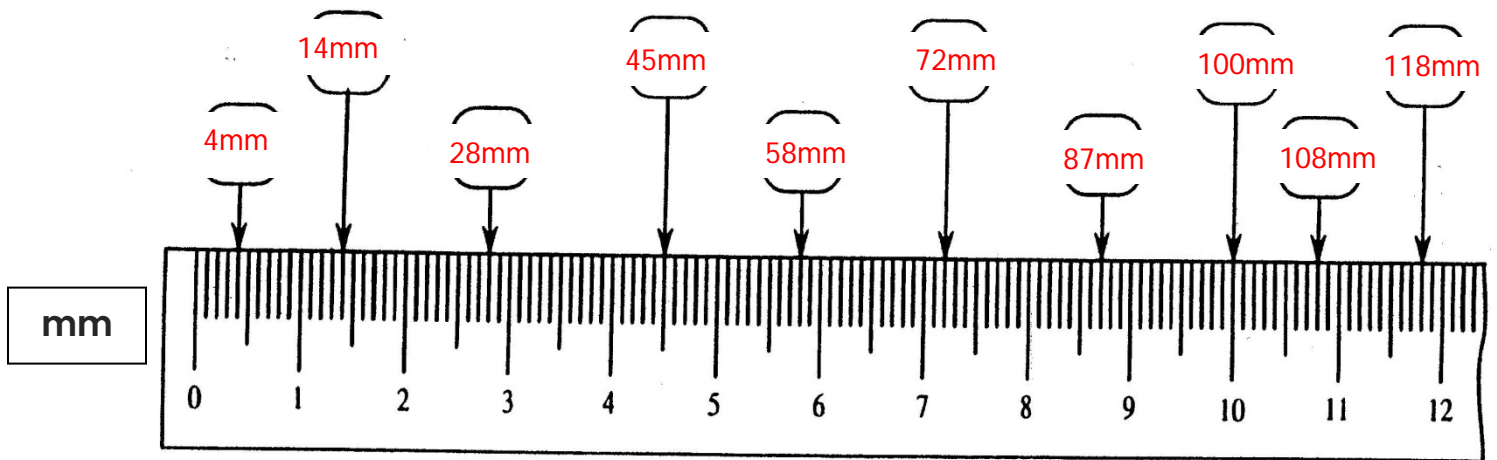
### Reading a Metric Rule Test

Directions: Complete the test by placing the correct metric measurements in the spaces provided. Write your answers using the correct measurement abbreviation (mm or cm).



**Reading a Metric Rule Test** *Answer Key*

Directions: Complete the test by placing the correct metric measurements in the spaces provided. Write your answers using the correct measurement abbreviation (mm or cm).



### Lesson #7: Measurement Estimation

#### Objectives

**Students will be able to...**

- Use estimation to determine measurement of objects.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

YouTube video <https://www.youtube.com/watch?v=hbvQ-PjyoLY>  
Paper  
Playing cards  
Tape measures

#### Lesson Sequence

- Review tests from yesterday. Answer any questions students may have. (5-10 minutes)
- Ask students what it means to estimate something? Brainstorm together what they may be able to use to estimate the measurement of something. (5 minutes)
- Watch the YouTube video <https://www.youtube.com/watch?v=hbvQ-PjyoLY> (2 minutes)
- Discuss the video as a class. (5 minutes)
- Pass out a piece of paper and 10 playing cards to each student. Have them go around the room using these objects like displayed in the video to measure 2-3 items around the room. (10 minutes)

## **BUILDING INDUSTRY TECHNOLOGY ACADEMY: YEAR ONE CURRICULUM**

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- Come back together and discuss what they found. (5-10 minutes)
- Now pass out tape measure and have students' measure the exact same objects. Compare the two measurements. Discuss their findings. (10 minutes)

### **Assessment**

Check for understanding during class discussions. Informal observations of students estimating measurements while roaming the room

### **Accommodations/Modifications**

One on one support  
Peer support  
List of possible objects for students to measure around the room

### Lesson #8: Adding and Subtracting Fractions

#### Objectives

##### Students will be able to...

- Identify the LCD and borrow from whole numbers while adding and subtracting fractions.
- Add any two mixed numbers using only a tape measure.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

YouTube video <https://www.youtube.com/watch?v=t6Gz2zwmeD0>  
YouTube video <https://www.youtube.com/watch?v=J8kjXfD4xas>  
YouTube video <https://www.youtube.com/watch?v=lwqoJAa23lw>  
Adding Standard Measurement worksheet  
Adding and Subtracting mixed numbers worksheet

#### Lesson Sequence

- Watch the *How to Add and Subtract Fractions You tube video* (4 minutes)  
<https://www.youtube.com/watch?v=t6Gz2zwmeD0>
- Complete the *Adding Standard Measurement worksheet* together as a class.  
(20 minutes)
- Watch the *How to add or subtract mixed numbers you tube video* (3 minutes)  
<https://www.youtube.com/watch?v=J8kjXfD4xas>
- Watch the *Tape Measure math YouTube video* (4 minutes)

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<https://www.youtube.com/watch?v=IwqoJAa23Iw>

- Complete the *Adding and subtracting mixed numbers worksheet* together. Answer any clarifying questions as needed. (20 minutes)

### Assessment

Check for understanding throughout the lesson.  
Collect and grade the two worksheets.

### Accommodations/Modifications

Multiplication Table  
One on One Support  
Peer Support  
Calculator



### Adding Standard Measurements

Directions: Use the standard side of your ruler to measure the following lines. After you have listed each measurement in the space provided (on the bold line in front of the line you measure), add the three measurements together to find the sum. Your final answer must be completely reduced to be correct.

1.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Total** \_\_\_\_\_ = \_\_\_\_\_

2.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Total** \_\_\_\_\_ = \_\_\_\_\_

3.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Total** \_\_\_\_\_ = \_\_\_\_\_

**BUILDING INDUSTRY TECHNOLOGY ACADEMY: YEAR ONE CURRICULUM**

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4.

_____	_____
_____	_____
_____	_____

Total\_\_\_\_\_ = \_\_\_\_\_

5.

_____	_____
_____	_____
_____	_____

Total\_\_\_\_\_ = \_\_\_\_\_

**Adding Standard Measurements** *Answer Key*

1.  $6\frac{3}{4}$

2.  $5\frac{3}{8}$

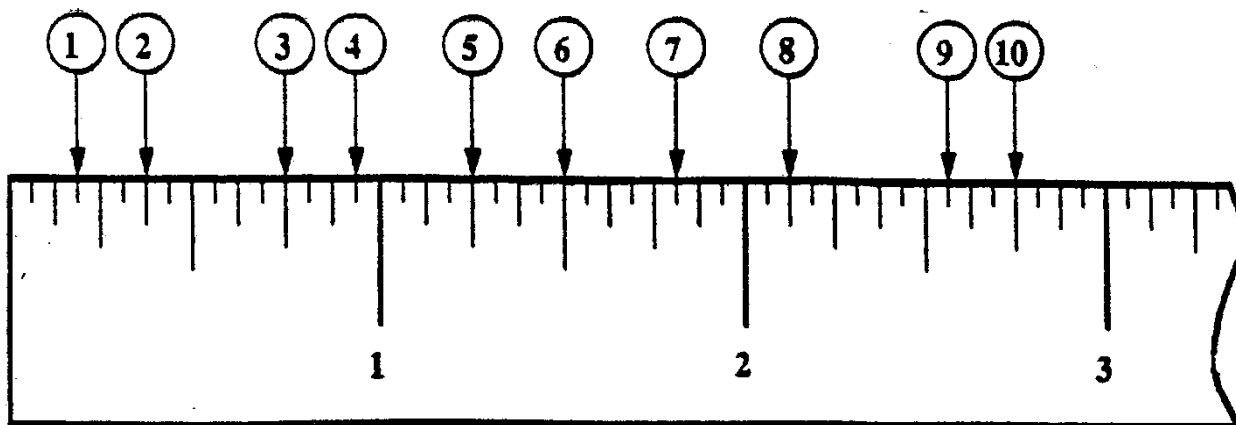
3.  $6\frac{1}{2}$

4.  $4\frac{5}{8}$

5.  $5\frac{3}{8}$

### Adding and Subtracting Mixed Numbers

Directions: Write the measurement of the corresponding number on the spaces provided below.



1.	6.
2.	7.
3.	8.
4.	9.
5.	10.

### Adding Mixed Numbers

11.  $6\frac{3}{4} + 2\frac{1}{4} =$

12.  $6\frac{1}{2} + 5\frac{3}{4} =$

13.  $21\frac{1}{2} + 1\frac{3}{4} =$

14.  $17\frac{5}{8} + 2\frac{3}{4} =$

15.  $5\frac{13}{16} + 7\frac{5}{16} =$

16.  $6\frac{3}{8} + 13\frac{5}{16} =$

### Subtracting Mixed Numbers

17.  $6\frac{3}{4} - 2\frac{1}{2} =$

18.  $6\frac{1}{2} - 5\frac{3}{16} =$

19.  $9\frac{1}{8} - 1\frac{3}{4} =$

20.  $12\frac{5}{8} - 2\frac{3}{4} =$

21.  $9\frac{13}{16} - 7\frac{5}{16} =$

22.  $7\frac{1}{8} - 5\frac{3}{4} =$

**Adding and Subtracting Mixed Numbers** *Answer Key*

1.  $\frac{3}{16}$

2.  $\frac{3}{8}$

3.  $\frac{3}{4}$

4.  $\frac{15}{16}$

5.  $1\frac{1}{4}$

6.  $1\frac{1}{2}$

7.  $1\frac{13}{16}$

8.  $2\frac{1}{8}$

9.  $2\frac{9}{16}$

10.  $2\frac{3}{4}$

11. 9

12.  $11\frac{11}{16}$

13.  $23\frac{1}{4}$

14.  $20\frac{3}{8}$

15.  $13\frac{1}{8}$

16.  $19\frac{11}{16}$

17.  $4\frac{1}{4}$

18.  $1\frac{5}{16}$

19.  $7\frac{3}{8}$

20.  $9\frac{7}{8}$

21.  $2\frac{1}{2}$

22.  $1\frac{3}{8}$

### Lesson #9: Adding and Subtracting Fractions Test

#### Objectives

**Students will be able to...**

- Demonstrate their knowledge and understanding with adding and subtracting fractions.

#### Common Core Standards

Number Sense 1.2, 1.3, & 3.1  
Cabinet Making and Wood Products Pathway 1.4  
G-MG 1, 3  
RSIT 11-12.2  
WHSST 11-12.9  
Technical Knowledge and Skills 10.2  
CTE Pathway D2.1  
Demonstration and Application 11.1

#### Materials

Adding and Subtracting Fractions Test

#### Lesson Sequence

- Review student questions regarding adding and subtracting fractions (5-10 minutes)
- Pass out *Adding and Subtracting Fractions Test* (40 minutes)

#### Assessment

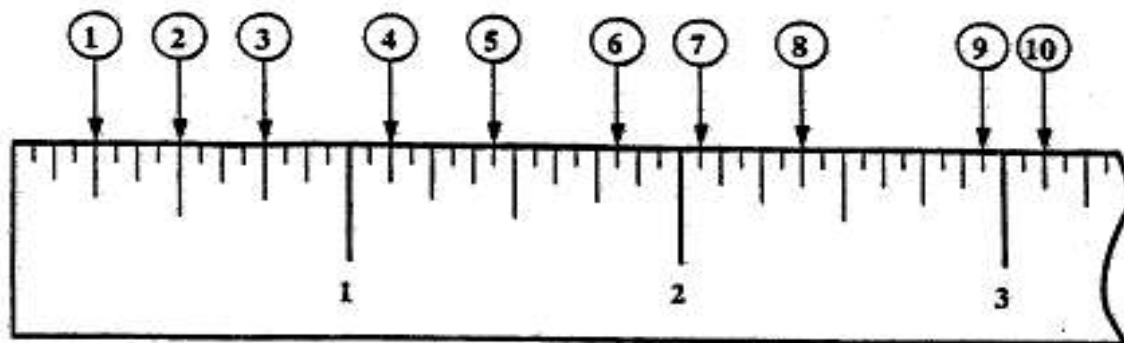
Assess student understanding based on their test scores.

#### Accommodations/Modifications

Calculator  
Multiplication Table

### Adding and Subtracting Fractions Test

Directions: Write the measurement of the corresponding number on the spaces below.



1.	6.
2.	7.
3.	8.
4.	9.
5.	10.

#### Adding Fractions

11.  $\frac{5}{8} + \frac{7}{8} =$

12.  $\frac{3}{4} + \frac{1}{4} =$

13.  $\frac{3}{16} + \frac{5}{16} =$

14.  $\frac{3}{4} + \frac{7}{8} =$

15.  $\frac{13}{16} + \frac{7}{16} =$

16.  $\frac{1}{2} + \frac{5}{16} =$

#### Subtracting Fractions

17.  $\frac{3}{4} - \frac{1}{4} =$

18.  $\frac{13}{16} - \frac{3}{4} =$

19.  $\frac{15}{16} - \frac{7}{16} =$

20.  $\frac{3}{4} - \frac{5}{8} =$

21.  $\frac{7}{8} - \frac{3}{16} =$

22.  $\frac{7}{16} - \frac{1}{4} =$