RESEARCH TRIANGLE NANOTECHNOLOGY NETWORK

Searching for the *Clue* in Metric Conversions

Overview

The students will use the metric system in order to understand the importance of unit conversions and the prefixes. Students and the instructor will be involved in large and small group discourse during the class periods using two different exercises. Part one of the lesson will involve an interactive note-taking strategy where students review metric units and unit conversions. Part two of the lesson will involve a "Clue" style activity developed through *clarkcreativeeducation* the where students will gather information through 10 different clues to solve the mystery.

Key Search Words

Physical Science, metric units, secondary science, unit conversions, whodunit, scientific notation

Learning Objectives

- Students will be able to identify the different units of measurement using the appropriate tools needed.
- Students will be able to calculate metric conversion using the appropriate tools.

Curriculum Alignment

NGSS Standards:

- ***HS-PS-1-7: Use Mathematical Representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction.***

NC Essential Standards

- ***PSc.2.1 Understand types, properties, and structure of matter.***

Classroom time required

- One 90-Minute class period

Materials & Technology

- Cleartouch
- Lenovo Thinkpad Laptop
- Science Notebooks
- Pencils/Pens
- Rulers
- Calculators
- Colored Pencils
- Tape
- Dry Erase Markers
- Laminated Clue sheets

Safety

Students will be given plastic rulers instead of wooden ones. They will have no hazardous chemicals or other dangerous materials that might cause a disturbance.

Teacher Preparation for Activity

- Spread the whodunit clues around the classroom in different group locations for students to complete.
- Set up a friendly competition between students and include a small prize for the groups that finish in the top 3.
- All worksheets (notes included) need to be printed and stapled together for each group according to class periods.
- Have the clue signs laminated and arranged around the classroom in different locations.
- Have the room rearranged to accommodate the locations of all the different clues.

Student Preparation for Activity

- Students should each have a science journal and writing utensil.

Procedure

Part 1

- Disclaimer: The materials used in this lesson were created through third parties and will need permission to be utilized.

- Step one: Introduce the day's lesson by asking students what they already know about the metric units (Do you know how far a meter is?) Have sections on the floor taped off and have students mark it off on the floor how long they believe a meter is. As students are participating, a student will be passing out the guided notes. Students will then be shown how far a meter really is after pulling up the tape to reveal the mark made by the teacher.
- Step two: Transition from the opening activity to having students complete the guided notes on the metric unit. At the end of the guided notes there is a practice section where students will complete the second half of the practice questions within their small groups. The teacher walks around the class, hopping from group to group, checking for recognition and group participation.
- Step three: As students complete the practice questions on the guided notes, the teacher preps for the whodunit presentation and hands out the blank scoresheet for the whodunit.
- Step four: Review the guided practice questions and clear up any misconceptions.

Part 2

- Step five: Introduce the whodunit activity where students will have to use 10 clues to either rule out or discover who hurt one of the six contestants. The contestants are Dr. Alpha, Miss Beta, Mrs. Gamma, Professor Delta, Mr. Epsilon, and Coach Omega. The activity is created like the game clue where the students need to get the correct answer to either disprove or support the last known location, player, and the method of how the contestant was injured. The students will mark on their handouts as the clues are answered on who is and is not the criminal. As students are answering the clues, the teachers will roam the classroom to ensure the students are all participating and understanding the activity.
- Step six: After the students have answered all 10 clues and concluded with who they believe the criminal is, where the crime was done, and the method, the students must write between 1-2 sentences who they believe performed the crime, the location, and the weapon used in that crime. After all students have shared who they believe the criminal is, the teacher will reveal who the real criminal is.

Differentiation

English Language Learners (ELL)

- Go over the instructions for both the whodunit and the guided notes together in class and if needed will interpret for the Spanish speaking students. (Enable language translator on Canvas or another website)

Academically Gifted Students

- Provide some deeper thinking questions as providing some mathematical problems to incorporate into the metric unit(s).

Students with learning disabilities

- Work in small groups to allow for better teacher to student interaction and allow for peers to assist if needed.

Assessment/Check for Understanding

- Summative (The whodunit)- Students are being challenged to figure out who the criminal is based on the clues.
- Informative (The Metric unit guided notes with practice questions)- Assessing students throughout the practice session as we roam the classroom checking for comprehension on the material.

Required resources

- Metric Unit Whodunit
- Scientific Notation Worksheet Whodunit
- Doodle Metric Unit (Teacher COPY)
- Doodle Note (Student COPY)

Author comments

- This lesson provides a written response for the students, as at the end of the presentation there are a few practice problems. You can skip those and go straight into the whodunit activity, but it is highly recommended that the students complete the practice problems as it gives an opportunity for the teacher to gauge the students' understanding. This lesson is adapted from Clark Creative Education and Cornell Doodle Notes

Sources

- *Curriculum browser*. Clark Creative Education. (2021, August 25). Retrieved June 20, 2022, from https://clarkcreativeeducation.com/curriculum-browser/?brand=Math&subject=Pre-Algebra&unit=Scientific%2BNotation
- Sunrise Science. (n.d.). *Metric System Cornell Doodle Notes Free*. Teachers Pay Teachers. Retrieved June 20, 2022, from https://www.teacherspayteachers.com/Product/Metric-System-Cornell-Doodle-Notes-FREE-3540486

Appendices

METRIC SYSTEM

ESSENTIAL QUESTION: What is the _____ _____ and how is it used to measure _____, _____, and _____?

TOPIC QUESTIONS:

1

Why is there a _____ for the _____ System?

The Metric System is used _____ in the fields of math and _____ becaus it is _____ and easy to use, _____ Imperial units.

The _____ units of weights an measures originated Britain in the early _____.

Imperial Units for...

Mass: one _____ ÷ 2000 = one _____ ÷ 16 = one _____

Length: one _____ ÷ 1760 = one _____ ÷ 3 = one _____ ÷ 12 = one _____

Fluid Volume: one _____ ÷ 4 = one _____ ÷ 2 = one _____ ÷ 2 = one _____ ÷ 16 = one _____

Dry Volume: one _____ ÷ 4 = one _____

The Imperial System units are based on antiquated thing like the length of the _____ foot and the size of a _____. The relationships between units are completely _____!

Do

Circle the conversion factors that are less than 10. Put a square around the conversion factors that are greater than 10.

2

What makes the Metric System _____?

A Magic Number!

hi-ya!

using Length

one ÷ 10 = one ÷ 10 = one ÷ 10 = one ÷ 10 = one

QUICK WATCH:

NASA Measuring Failure

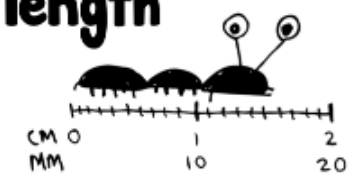
https://bit.ly/30FU2

PLC QUESTIONS:

3

What are some metric _____ units?

length



meter (___)

mass

gram (___)

volume

liter (___)

Do Underneath each unit above, list things that you measure using that base unit family. For example, the length of a room is measured in meters.

4

What are the _____ of the metric system and how can we _____ them?

kilo- (k) _____ (h) _____ (___) or (da) _____ Unit

Henry

by _____ deci- (___) _____ (___) _____ (___)!

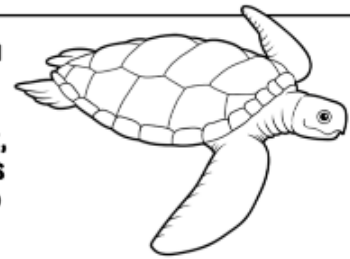
Do Make up your OWN mnemonic device to remember the metric base units in order:

5

_____ would you need to _____ between metric units?

Your friend asks how long your shoes are. You get a meter stick and see that your sneaker measures 0.24 meters. But, this isn't a very convenient unit to use for this instance. Luckily, 0.24 meters easily converts to 24 centimeters (we just moved the decimal point two times to the right, or multiplied by 100).

0.24 _____ is _____ to



An adult male sea turtle gets weighed by a conservation tean His mass is 320,000 grams. But this number is too big for their data table, so they can simply convert it to 320 kilograms by moving the decimal three time to the left (or dividing by 1000).

_____ grams is _____ t

6

_____ do you

_____

between the metric

_____?

It's all about the _____ point!

decimal point at the _____! For example: 849 is actually _____

"The King Henry Slider"

King	Henry	Died	by	drinking	chocolate	milk
_____	_____	_____	[_____]	_____	_____	_____

			length			
____	hm	Dm/dam	m	dm	____	mm

			mass			
kg	____	Dg/dag	g	____	cg	____

			volume			
kL	hL	DL/daL	____	dL	cL	____

Divide by each hop to the (moving decimal point)

Multiply by each hop to the (moving decimal point)

How to Use the King Henry Slider:

1. Put your _____ on the unit that you are _____ from
2. _____ LEFT or RIGHT to the unit that you _____ to convert to
3. Count the _____ of hops
4. Move the _____ point in the original number that number of spaces to the LEFT or RIGHT

For Example:
I want to convert 27.4 grams into milligrams. I start with my finger on grams. I hop 3 times to the RIGHT to get to milligrams on the King Henry Slider. So, I move the decimal point in 27.4 three spaces to the RIGHT: 27400.

SUM IT UP!

Write the base unit that you would use in each of these cases of measurement:

1) Julianna is measuring the *volume* of liquid Tylenol to take for her fever: _____

2) Luke is measuring the *length* of the field that he threw his baseball: _____

3) Kevin is measuring the *mass* of his backpack before his flight: _____

Try these conversions!

Example: 137 meters equals how many kilometers?

Going from meters (the base unit) to kilometers, hop three times to the LEFT. So, move the decimal point three places to the LEFT (this is the same as dividing by 1000). 137. gives 0.137 km

12) 124.5 kilometers equals how many meters? _____

13) 456 milligrams equals how many grams? _____

14) 56.72 centiliters equals how many dekaliters? _____

15) 2000 mg = _____ g

16) 104 km = _____ m

17) 480 cm = _____ m

18) 5.6 kg = _____ hg

19) 8 mm = _____ cm

20) 5 L = _____ mL

21) 198 g = _____ kg

22) 75 mL = _____ L

23) 50 cm = _____ Dm

24) 0.85 hg = _____ dg

Write the correct abbreviation for each metric unit.

4) kilogram = _____

5) decimeter = _____

6) dekagram = _____

7) milliliter = _____

8) kilometer = _____

9) millimeter = _____

10) hectoliter = _____

11) milligram = _____

Compare the two quantities by writing *less than, greater than or equal to* on the line.

HINT: convert one of the sides then compare!

25) 63 cm is _____ 6 m

26) 5 g is _____ 508 mg

27) 1500 mL is _____ 1.5 L

28) 536 cm is _____ 53.6 dm

29) 43 mg is _____ 5 g

30) 3.6 m is _____ 36 cm

How are you feeling about the basics of the Metric System? Circle one:

Name: _____ Class: _____ Date: _____ KEY

METRIC SYSTEM

ESSENTIAL QUESTION: What is the metric system and how is it used to measure length, mass, and volume?

TOPIC QUESTIONS:

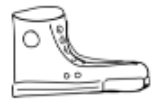
1

Why is there a need for the Metric System?

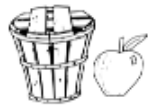
The Metric System is used internationally in the fields of math and science because it is standardized and easy to use, unlike Imperial units.

Imperial Units for...

Mass:  one ton ÷ 2000 =  one pound ÷ 16 =  one ounce

Length:  one mile ÷ 1760 =  one yard ÷ 3 =  one foot ÷ 12 =  one inch

Fluid Volume:  one gallon ÷ 4 =  one quart ÷ 2 =  one pint ÷ 2 =  one cup ÷ 16 =  one tablespoon

Dry Volume:  one bushel ÷ 4 =  one peck

The Imperial System units are based on antiquated things like the length of the King's foot and the size of a barleycorn. The relationships between units are completely random!

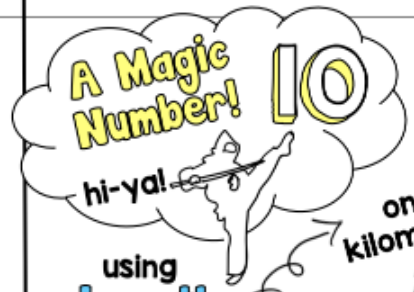
The Imperial units of weights and measures originated in Britain in the early 1800s.

Do

Circle the conversion factors that are less than 10. Put a square around the conversion factors that are greater than 10.

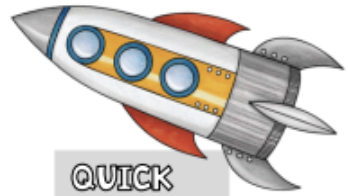
2

What makes the Metric System easy?



using **Length** as an example

one kilometer ÷ 10 = one hectometer ÷ 10 = one dekameter ÷ 10 = one meter ÷ 10 = one decimeter ÷ 10 = one centimeter ÷ 10 = one millimeter



QUICK WATCH:

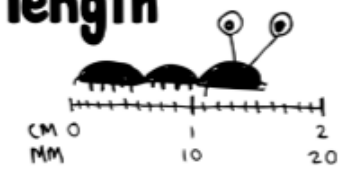
NASA Measuring Failure
https://bit.ly/30EU2Lv

KEY

TOPIC QUESTIONS:

3

What are some metric base units?



meter (m)

gram (g)

liter (L)

Do — Underneath each unit above, list things that you measure using that base unit family. For example, the length of a room is measured in meters.

4

What are the prefixes of the metric system and how can we remember them?

kilo- (k)	hecto- (h)	deka- (D) or (da)	Base Unit	deci- (d)	centi- (c)	milli- (m)
King	Henry	Died	by	drinking	chocolate	milk!

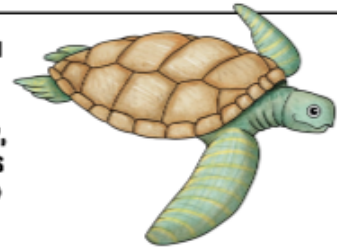
Do — Make up your OWN mnemonic device to remember the metric base units in order:

5

Why would you need to convert between metric units?

Your friend asks how long your shoes are. You get a meter stick and see that your sneaker measures 0.24 meters. But, this isn't a very convenient unit to use for this instance. Luckily, 0.24 meters easily converts to 24 centimeters (we just moved the decimal point two times to the right, or multiplied by 100).

0.24 meters is equal to 24 centimeters



An adult male sea turtle gets weighed by a conservation team. His mass is 320,000 grams. But this number is too big for their data table, so they can simply convert it to 320 kilograms by moving the decimal three times to the left (or dividing by 1000).

320,000 grams is equal to 320 kilograms

KEY

TOPIC QUESTIONS:

6

How do you convert between the metric units?

It's all about the decimal point!

Keep in mind that every whole number has an 'invisible' decimal point at the end! For example: **849 is actually 849.0**

"The King Henry Slider"

King	Henry	Died	by	drinking	chocolate	milk
Kilo	Hecto	Deka	[base]	deci	centi	milli
			length			
km	hm	Dm/dam	m	dm	cm	mm
			mass			
kg	hg	Dg/dag	g	dg	cg	mg
			volume			
kL	hL	DL/daL	L	dL	cL	mL

÷ **Divide by 10 each hop to the left (moving decimal point left)**

Multiply by 10 each hop to the right (moving decimal point right) ×

How to Use the King Henry Slider:

1. Put your finger on the unit that you are STARTING from
2. Hop LEFT or RIGHT to the unit that you WANT to convert to
3. Count the number of hops
4. Move the decimal point in the original number that number of spaces to the LEFT or RIGHT

For Example:
I want to convert 27.4 grams into milligrams. I start with my finger on grams. I hop 3 times to the RIGHT to get to milligrams on the King Henry Slider. So, I move the decimal point in 27.4 three spaces to the RIGHT: 27400.

This is the same as MULTIPLYING 27.4 by 10 x 10 x 10 [or 1000]. So 27.4 g is the same as 27400 mg.

Name: _____ Class: _____ Date: _____ KEY

SUM IT UP!

Write the base unit that you would use in each of these cases of measurement:

1) Julianna is measuring the *volume* of liquid Tylenol to take for her fever: liters

2) Luke is measuring the *length* of the field that he threw his baseball: meters

3) Kevin is measuring the *mass* of his backpack before his flight: grams

Write the correct abbreviation for each metric unit.

4) kilogram = kg

5) decimeter = dm

6) dekagram = Dg

7) milliliter = mL

8) kilometer = km

9) millimeter = mm

10) hectoliter = hL

11) milligram = mg

Try these conversions!

Example: 137 meters equals how many kilometers?

Going from meters (the base unit) to kilometers, hop three times to the LEFT. So, move the decimal point three places to the LEFT (this is the same as dividing by 1000). 137. gives 0.137 km

12) 124.5 kilometers equals how many meters? 124,500 cm

13) 456 milligrams equals how many grams? 0.456 g

14) 56.72 centiliters equals how many dekaliters? 0.05672 daL

15) 2000 mg = 2 g

16) 104 km = 104,000 m

17) 480 cm = 4.8 m

18) 5.6 kg = 56 hg

19) 8 mm = 0.8 cm

20) 5 L = 5,000 mL

21) 198 g = 0.198 kg

22) 75 mL = 0.075 L

23) 50 cm = 0.05 Dm

24) 0.85 hg = 850 dg

Compare the two quantities by writing *less than, greater than or equal to* on the line.

HINT: convert one of the sides then compare!

25) 63 cm is less than 6 m

26) 5 g is greater than 508 mg

27) 1500 mL is equal to 1.5 L

28) 536 cm is equal to 53.6 dm

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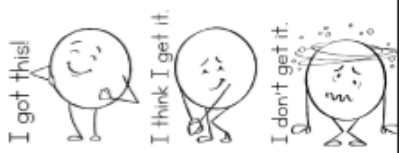
30) 3.6 m is greater than 36 cm

How are you feeling about the basics of the Metric System? Circle one:



- Scientific Notation Worksheet Whodunit

Whodunnit?

Name: _____

Six contestants on a reality TV show were stunned to find their lowest scoring colleague was "injured." They must figure out the crime before the bell rings. The question is *Whodunnit*? And how... The Player, Last Known Whereabouts and Method that are left unaccounted for -- is the solution.

1.	2.
3.	4.
5.	6.

7.	8.
9.	10.

Who is the "Criminal"?

(The three boxes left unchecked will reveal the crime. If you cannot figure it out, you may be next.)

The Players		The Last Known Whereabouts		The Method	
Dr. Alpha		Atrium		Chemical Poisoning	
Miss Beta		Gym		Cougar Attack	
Mrs. Gamma		Kitchen		Electrocution	
Professor Delta		Library		Fallen Object	
Mr. Epsilon		Movie Theater		Stubbed Toe	
Coach Omega		Pool		Venomous Bite	

Clue Cards (Note: clues also found in slides)

???

Clue #1

WHODUNNIT?

Write in standard form:

5.34×10^4

534	A cougar did not attack the victim.
5,340	Mr. Epsilon was preparing a snack in the kitchen.
53,400	Miss Beta was relaxing by the pool.
534,000	A venomous snake did not bite the victim.

WHODUNNIT?

Clue #2

Write in standard form:

8.1×10^{-2}

.081	Professor Delta was watching a French documentary in the theater.
.81	The victim did not have a venomous bite.
8.1	Mrs. Gamma was using an elliptical machine in the gym.
81	The murder was not done with a fallen object.

???

???

Clue #3

WHODUNNIT?

Write in standard form:

3.1478×10^3

31.478	Coach Omega was tanning by the pool.
314.78	Professor Delta was adjusting the equipment in the gym.
3,147.8	Chemical poisoning was not the cause of the injury.
31,478	A cougar did not maul the victim.

WHODUNNIT?

Clue #4

Write in standard form:

-4.0698×10^5

-406.98	Dr. Alpha was sipping tea by the pool.
-4,069.8	The victim did not stub a toe.
-40,698	Miss Beta was watching a movie in the theater.
-406,980	A cougar did not attack the victim.

???

???

Clue #5

WHODUNNIT?

Write the number with scientific notation:
980,000

9.8×10^2	Chemical poisoning is not the cause of the injury.
9.8×10^3	Mrs. Gamma was exercising in the gym.
9.8×10^4	A cougar did not injure the victim.
9.8×10^5	Coach Omega was making lunch in the kitchen.

WHODUNNIT?

Clue #6

Write the number with scientific notation:
7,436,100

$.74361 \times 10^7$	Professor Delta was researching in the library.
74.361×10^5	The victim did not have a venomous bite.
7.4361×10^6	The injury was not from a fallen object.
7.4361×10^5	Mr. Epsilon was watering plants in the atrium.

???

???

Clue #7

WHODUNIT?

Write the number with scientific notation:
.0000000083

83×10^{-10}	Dr. Alpha was on the treadmill in the gym.
8.3×10^{-10}	The victim was not electrocuted.
8.3×10^{-9}	The victim did not stub a toe.
83×10^{-9}	Miss Beta was reading in the kitchen.

WHODUNIT?

Clue #8

Write the number with scientific notation:
$-20{,}081$

-2.081×10^{4}	The victim was not electrocuted.
-2.0081×10^{4}	Mr. Epsilon was exercising in the gym.
-20.081×10^{4}	The victim did not stub a toe.
-2.008×10^{4}	Mrs. Gamma was changing a light bulb in the library.

???

???

Clue #9

WHODUNIT?

Write the number with scientific notation:

283×10^5

28.3×10^6	Dr. Alpha was reading in the library.
2.83×10^7	The injury was not electrocution.
2.83×10^8	The injury did not have a venomous bite.
$.283 \times 10^8$	Mrs. Gamma was playing a game on her iPad in the atrium.

WHODUNIT?

Clue #10

Write the number with scientific notation:

$-.07 \times 10^{-8}$

7×10^{-8}	The injury was not because of a venomous bite.
-7.0×10^{-10}	Mrs. Gamma was reshelving books in the library.
-7.0×10^{-11}	Dr. Alpha was napping on a couch in the atrium.
-7.0×10^{-12}	The victim did not stub a toe.

???

- Metric Unit Whodunit

WHODUNNIT?

SKILL BUILDERS

Scientific Notation

INTERACTIVE

Instructions

Six contestants on a reality TV show were stunned to find their lowest scoring colleague was "injured." You must figure out the crime before the end of the day. The question is **Whodunnit?** And how... **The Player, Last Known Whereabouts** and **Method** that are left unaccounted for -- is the solution.

(#1) In this document, you will find 10 **Clues** that you must crack. Be sure to show all necessary work in the space provided. You can take a photo of your work and insert it if you prefer to do that.

(#2) Each correct answer will rule out either a **Player** and a **Last Known Whereabouts** OR a **Method**. When you get this clue, you need to mark it off on the **"Who is the Criminal?"** page (Slide 3).

(#3) After you collect all 10 clues. There will only be one possibility remaining. This reveals the crime. Write a sentence that includes the "criminal", location of the crime, and the method used to cause the injury on the **"What Happened?"** page (Slide 14).

Who is the "Criminal"?

(The three boxes left unchecked will reveal the crime. If you cannot figure it out, you may be next.)

The Players	✗	The Last Known Whereabouts	✗	The Method	✗
Dr. Alpha		Atrium		Chemical Poisoning	
Miss Beta		Gym		Cougar Attack	
Mrs. Gamma		Kitchen		Electrocution	
Professor Delta		Library		Fallen Object	
Mr. Epsilon		Movie Theater		Stubbed Toe	
Coach Omega		Pool		Venomous Bite	

Clue #1

Whodunnit?

Write in standard form:

5.34×10^4

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

534	*A cougar did not attack the victim.*
5,340	*Mr. Epsilon was preparing a snack in the kitchen.*
53,400	*Miss Beta was relaxing by the pool.*
534,000	*A venomous snake did not bite the victim.*

WHODUNNIT? CLUE #2

Write in standard form:
8.1×10^{-2}

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

.081	*Professor Delta was watching a French documentary in the theater.*
.81	*The victim did not have a venomous bite.*
8.1	*Mrs. Gamma was using an elliptical machine in the gym.*
81	*The murder was not done with a fallen object.*

CLUE #3 WHODUNNIT?

Write in standard form:
3.1478×10^{3}

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

31.478	*Coach Omega was tanning by the pool.*
314.78	*Professor Delta was adjusting the equipment in the gym.*
3,147.8	*Chemical poisoning was not the cause of the injury.*
31,478	*A cougar did not maul the victim.*

WHODUNNIT? CLUE #4

Write in standard form:
-4.0698×10^5

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

-406.98	*Dr. Alpha was sipping tea by the pool.*
-4,069.8	*The victim did not stub a toe.*
-40,698	*Miss Beta was watching a movie in the theater.*
-406,980	*A cougar did not attack the victim.*

CLUE #5 WHODUNNIT?

Write the number with scientific notation: 980,000

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

9.8×10^2	*Chemical poisoning is not the cause of the injury.*
9.8×10^3	*Mrs. Gamma was exercising in the gym.*
9.8×10^4	*A cougar did not injure the victim.*
9.8×10^5	*Coach Omega was making lunch in the kitchen.*

WHODUNNIT? CLUE #6

Write the number with scientific notation:
7,436,100

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

$.74361 \times 10^{7}$	*Professor Delta was researching in the library.*
74.361×10^{5}	*The victim did not have a venomous bite.*
7.4361×10^{6}	*The injury was not from a fallen object.*
7.4361×10^{5}	*Mr. Epsilon was watering plants in the atrium.*

CLUE #7 WHODUNNIT?

Write the number with scientific notation:
.0000000083

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

83×10^{-10}	*Dr. Alpha was on the treadmill in the gym.*
8.3×10^{-10}	*The victim was not electrocuted.*
8.3×10^{-9}	*The victim did not stub a toe.*
83×10^{-9}	*Miss Beta was reading in the kitchen.*

WHODUNNIT?

CLUE #8

Write the number with scientific notation:
-20,081

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

-2.081×10^4	*The victim was not electrocuted.*
-2.0081×10^4	*Mr. Epsilon was exercising in the gym.*
-20.081×10^4	*The victim did not stub a toe.*
-2.008×10^4	*Mrs. Gamma was changing a light bulb in the library.*

CLUE #9

WHODUNNIT?

Write the number with scientific notation:
283×10^5

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

28.3×10^6	*Dr. Alpha was reading in the library.*
2.83×10^7	*The injury was not electrocution.*
2.83×10^8	*The injury did not have a venomous bite.*
$.283 \times 10^8$	*Mrs. Gamma was playing a game on her iPad in the atrium.*

WHODUNNIT? CLUE #10

Write the number with scientific notation:

$-.07 \times 10^{-8}$

ADD TEXT

Stretch the Yellow Highlight Box over the answer.

7×10^{-8}	*The injury was not because of a venomous bite.*
-7.0×10^{-10}	*Mrs. Gamma was reshelving books in the library.*
-7.0×10^{-11}	*Dr. Alpha was napping on a couch in the atrium.*
-7.0×10^{-12}	*The victim did not stub a toe.*

WHAT HAPPENED?

Write a sentence that includes the "criminal", the location of the crime, and the type of injury.

TEXT