EDMUND W. GORDON

Rising Grade 8 Science 2025
Summer Homework Packet

BROOKLYN LAB
CHARTER SCHOOL

Biology Summer Assignment

Dear Students:

Welcome to Biology! In order to do well in this course, you need to become fluent in the language of the discipline. Biology includes an extensive set of vocabulary words and phrases that you will most likely be unfamiliar with. However, there are tricks to figuring out new vocabulary words, terms, etc. Often, terms in biology come from a set of root words as well as prefixes and suffixes that give us clues as to what the terms mean.

This Summer Assignment will touch upon both of these ideas to help prepare you for the coming year. It will count as your first grade for the year so make sure you start off the year strong! Good Luck!

PSI Biology Prefix and Suffix Reference Sheet

Prefix/Suffix	Definition	Prefix/Suffix	Definition
a-	without	***multi-***	many
ab-	away from	***mut-***	to change
ad-	near	***myco-***	fungi
aero-	air	***neco-***	corpse
alveus	cavity	***neur-***	nerve
arthron-	joint	***nomen-***	name
atrium-	entrance room	***niga-***	black
auto-	self	***oculo-***	eye
bacterio-	bacteria	***oligo-***	few
bi-	two	***-oma***	tumor
bio-	life	***omni-***	all
carnis-,carn-	meat	***oo, ovum***	egg
chele-	claw	***osteo-***	bone
chloro-	green	***paleo-***	old
chroma-	color	***ped, pod***	foot

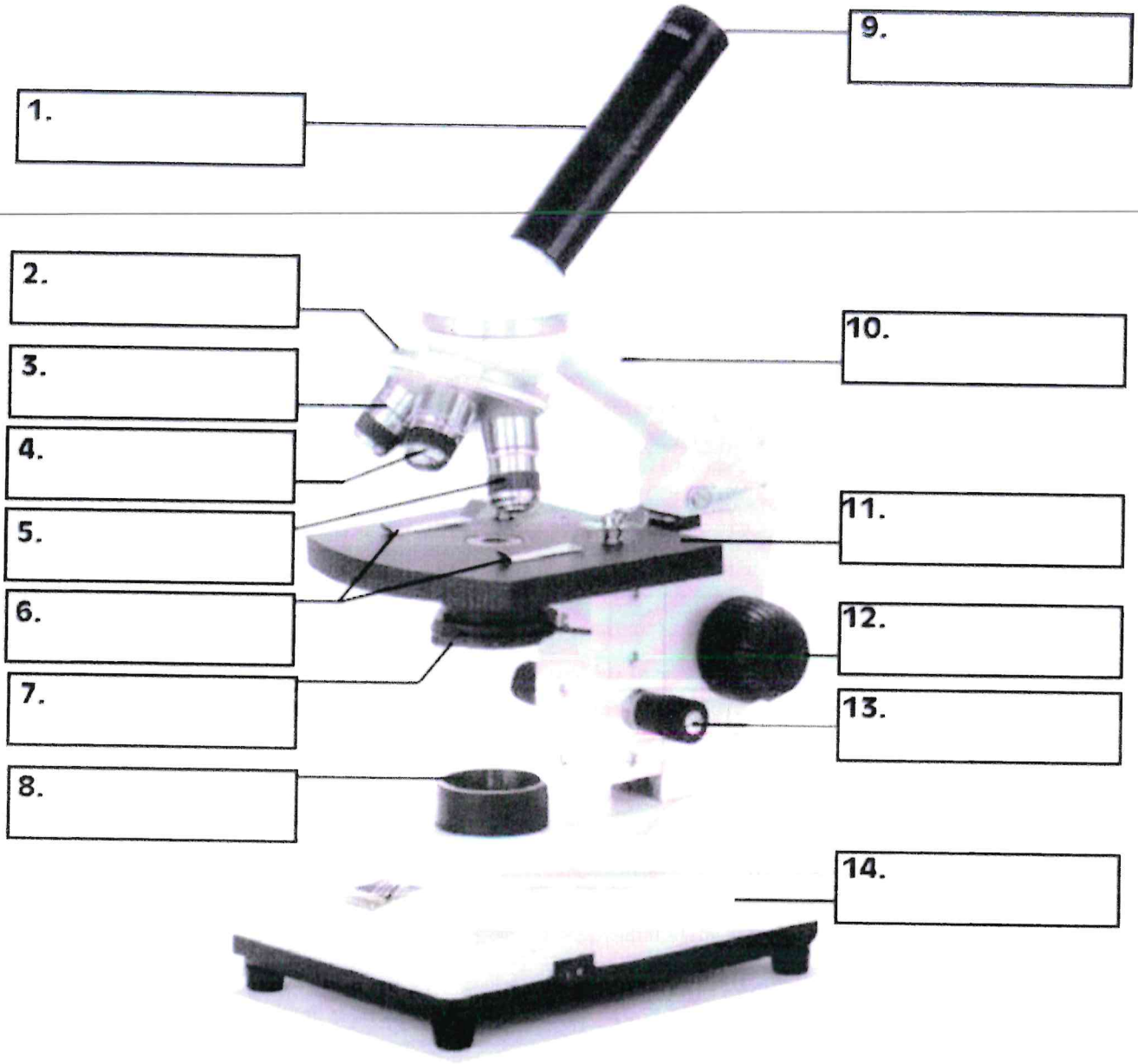
-cide	killer of	***peri-***	around
con-	with	***pestis***	plague
cytis-	pouch	***phaeo-***	brown
-cyte, cyto-	cell	***phage-***	to eat
dermis-, derm-	skin	***-phore***	bearer
		photo-	light
di-	two	***-phyll***	
ecto-	on the outside	***-phyte, phyto-***	leaf
endo-	inner, inside		plant
epi-	upon	***pino-***	to drink
eu-	true	***plankto-***	drifting
exo-	outside of	***poly-***	many
feto-	fetus	***pseudo-***	false
gastro-	stomach	***primordis-***	original
-gen	producing	***pro-***	first
geo-	earth	***renes-***	kidney
gymno-	naked	***reptilis-***	crawling
halo-	salt	***rhiza, rhizo-***	root
hemato-	blood	***rodere***	to gnaw
hemi-	half	***sacchrum***	sugar
herb-	plant	***sapros-***	rotten
hetero-	other	***-scopy***	observation
histo-	tissue	***soma-***	body
homo-	same, like	***sonus-***	sound
hydro-	water	***sperma-***	seed
hyper-	over	***spirare***	breathe
hypo-	under	***-stasis***	position
inter-	between	***taxis***	arrangement
intra-	within	***telo-***	end
iso-	equal	***thallus***	green shoot
-itis	infection	***therm-***	heat
karyo-	nucleus	***thrombos***	clot
leuco-	white	***trans-***	across
locus	place	***tri-***	three
-logy	study of	***troph-***	feed

lysis	to loosen, break	***umbilicus***	navel
macro-	large	***uni-***	one
maxilla	jaw	***vasculum***	vessel
mensis	month	***vor-***	to eat, devour
mesos-	middle	**xero-**	dry
meta-	between	**zoo-, zoa-**	animal
micro-	small	**zygon-**	yoke
mono-	one	**-ase**	enzyme
morph-	form	**-ose**	sugar

Part I Instructions: Define the following terms using your prefix-suffix reference sheet. Underline the prefix &/or suffix in each biological term. Use a separate sheet of paper if necessary.

- **Example: <u>THERM</u>O<u>METER</u>** – *therm means heat & meter means measure. Therefore, a thermometer is an instrument used to measure heat.*

1. Biology
2. Osteocyte
3. Dermatitis
4. Epidermis
5. Hematology
6. Herbicide
7. Neuritis
8. Protozoa
9. Carnivore
10. Polysaccharide
11. Hypertension
12. Hypodermic
13. Macronucleus



Questions:

1. When focusing a new slide, what objective should you start with? _____
2. Which focusing knob should only be used with the low power objective? _____
3. Which focusing knob should be used with the medium- or high-power objective? _____
4. What does the diaphragm control? _____
5. When carrying a microscope, you should hold onto the_____and the_____
6. If the ocular lens is 10x and the objective lens is 65x, what is the total image magnification? _____

Part IV: Science and the Scientific Method

The scientific method is the problem solving method that all scientist use to solve questions related to our world. Experimentation is a key component of the scientific method and the foundation of upon which all science rests. To better your understanding of the scientific method, define the following terms:

Scientific Method	
Quantitative Data	
Qualitative Data	
Hypothesis	
Independent/Manipulated Variable	
Dependent/Responding Variable	
Control	
Observation	
Analysis	
Inference	
Conclusion	
Prediction	

Read the paragraph below and answer the following questions.

Chris wanted to test the effect of diet pills on how tall the tomato plants in his garden would grow. He took two pots, filled them with dirt from the same bag, and planted four tomato plants in each. He watered one planter with tap water, and he watered the other planter with tap water mixed with dissolved diet pills. The plants were in the same location to ensure that they got the same amount of sunlight, and the water was measured so that each pot received the same amount of water. He measured their height at the end of each week for eight weeks, and averaged the height of the four plants in each pot. He then graphed the results to show how the diet pills affected the height of the plants.

1. What is the independent variable of this experiment? _____
2. What is the dependent variable of this experiment? _____
3. What is the control? _____
4. How many trials were included in this experiment? _____
5. Write a hypothesis for this experiment in the "If…, then…." Format.

   _____

Read the paragraph below and answer the following questions.

During gym class Sally noticed that her friend Melissa always ran faster than she could run. Sally knew that they exercised equally, so she wondered what could cause Melissa to run so fast. Sally began to compare herself and Melissa to see what could cause the difference in speeds. She noticed that Melissa was taller and wondered if height affected speed. Sally predicted that taller people were able to run faster, but wanted to check her prediction. She asked her gym teacher if she could test her idea because the class consisted of only girls and she thought this would help her get accurate results. Sally measured all of her classmates' height in centimeters and recorded it in her chart. Each classmate then ran one mile while Sally timed them with a stopwatch and recorded the data in seconds. She then began to review her data and look for the answer to her question.

1. What question is Sally trying to answer?

   _____

   _____

2. What made her want to answer this question?

   _____

   _____

3. What is the dependent variable in this experiment?

   _____

4. Are the observations qualitative or quantitative?

   _____

5. What factors does Sally think might cause the measurement to change?

   _____

   _____

6. Is there a control group used in this experiment? If so, what is it?

   _____

Read the paragraph below and answer the following questions.

The Strange Case of Beriberi In 1887, a strange nerve disease attacked the people in the Dutch East Indies. The disease was Beriberi. Symptoms of the disease include weakness, loss of appetite, and heart failure. Scientists thought the disease might be caused by bacteria. They injected chickens with bacteria from the blood of patients with Beriberi. The injected chickens became sick. However, a group of chickens that were not injected with bacteria also became sick.

1. What was the problem presented in this case?

2. What was the hypothesis?

3. How was the hypothesis tested?

4. Should the hypothesis be rejected or accepted based on the experiment? Why?

One of the scientists, Dr. Eijkman, made an important observation. Before the experiment, all of the chickens had eaten whole-grain rice, but during the experiment, the chickens were fed polished rice. Dr. Eijkman researched this interesting case. He found that polished rice lacked thiamine, a vitamin necessary for good health.

5. What is the new hypothesis in this scenario?

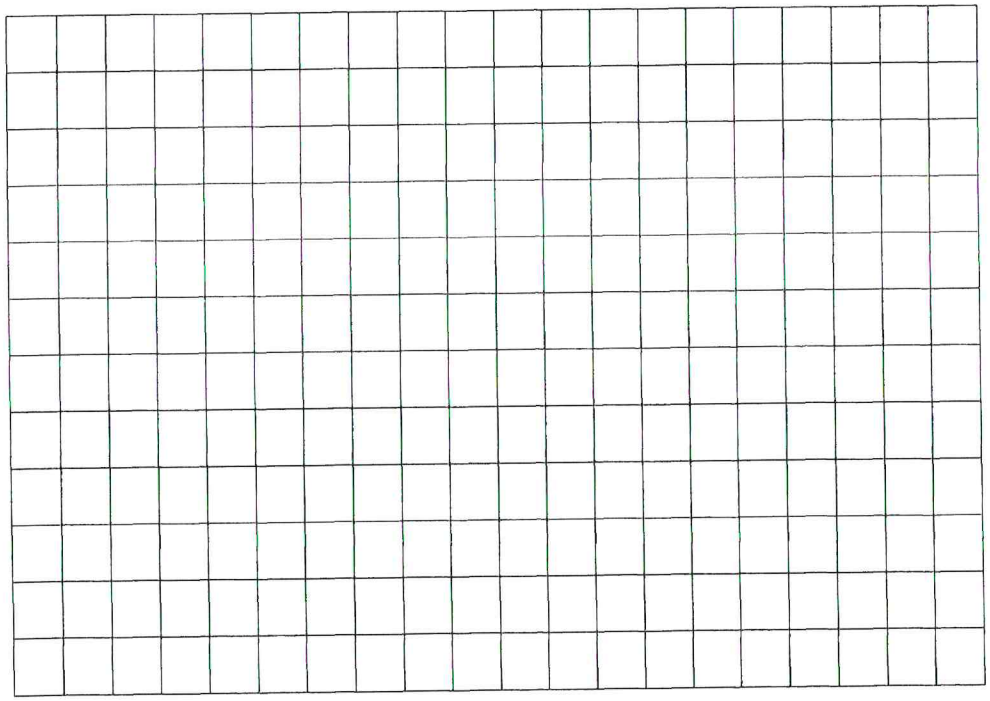
Part V: How to Create a Good Graph

1. Graphs need a title above the graph that summarizes the information that it is showing.
2. Both the X and Y axis need labeled (this means that you need to write what the numbers mean, for example: days, years, degrees Celcius, etc).
3. If you used any kind of symbol or colors then you have to include a key or legend to explain what they mean.
4. Your graph is designed to be visually pleasing and serve as a visual representation of numbers, so make it as large as possible (make it take up as much space as possible on the graph paper).
5. A graph is a visual representation of numbers so it needs to be very nice and neat (use rulers if need be).

Experiment 1: Use the following data to create an appropriate graph and answer the questions.

Diabetes is a disease affecting insulin producing glands of the pancreas. If there is not enough insulin being produced by these cells, the amount of glucose in the blood will remain high. A blood glucose level above 140 for an extended period of time is not normal. This disease, if not brought under control, can lead to severe complications and even death.

Time after eating (in hours)	Glucose in mg/dL Person A	Glucose in mg/dL Person B
0.5	170	180
1	155	195
1.5	140	230
2	135	245
2.5	140	235
3	135	225
4	130	200



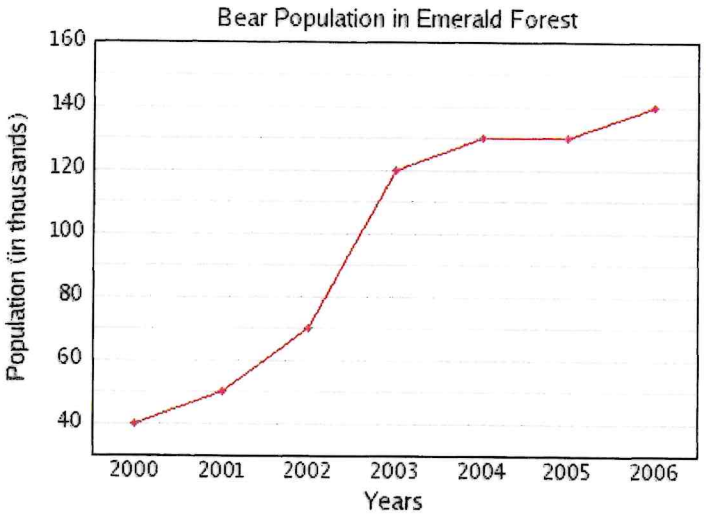
1. Which individual would you potentially diagnose as a diabetic?

2. What evidence do you have that supports your answer?

3. If the time period was extended to 6 hours, what would be the expected blood glucose level for Person A _____, Person B_____ (assume they do not eat again)

Part VI: Graph Interpretation

Use the graph below to answer the following questions.



1. What type of graph is shown above? Why is this graph appropriate to display this type of data?

2. What is the manipulated (independent) variable?

3. What is the responding (dependent) variable?

4. How many bears were in the Emerald Forest in 2001?

5. Based on the graph above, when did the greatest increase in the bear population occur?

Name: _____

Metric System Basics

Units of Length

Length and distance in the metric system are based on the standard unit called the *meter*. All other metric units for length and distance are multiples or submultiples of the meter. Some of the other metric units of length are shown below.

Name	Abbreviation	Value
kilometer	km	1,000 meters
hectometer	hm	100 meters
dekameter	dam	10 meters
meter	m	1 meter
decimeter	dm	.1 meter
centimeter	cm	.01 meter
millimeter	mm	.001 meter

The metric system is based on the decimal system (base ten). When one unit of measure is compared to the next unit of measure in the metric system, it is 10 times more or 10 times less than the next unit. From this you can see that a meter is 10 times the length of a decimeter, 100 times the length of a centimeter, and 1,000 times the length of a millimeter (10 x 10 x 10).

1 kilometer (km) = 10 hectometers (hm)

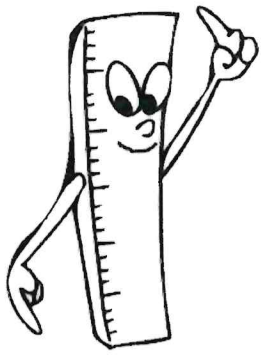
1 hectometer (hm) = 10 dekameters (dam)

1 dekameter (dam) = 10 meters (m)

1 meter (m) = 10 decimeters (dm)

1 decimeter (dm) = 10 centimeters (cm)

1 centimeter (cm) = 10 millimeters (mm)



Compared to a mile, how long is a kilometer (km)? Below are some of the U.S. units of length converted to metric units of length. This will give you an idea of how the metric units of length compare to the U.S. units of length.

1 inch = 2.54 cm 1 foot = 30.48 cm 1 yard = 0.9144 m 1 mile = 1.61 km

Name: _____

Metric System Basics
Units of Length

Review page 1 and answer the questions below.

1. What is the base unit of measure for length in the metric system? _____
2. How many meters are there in one kilometer? _____
3. What number system is the metric system based on? _____
4. How many decimeters are there in one meter? _____
5. A decimeter is how many more times the length of a centimeter? _____
6. How many centimeters are in one meter? _____

Draw a line to match the abbreviation to the correct unit of measure.

kilometer	mm
hectometer	cm
dekameter	dm
meter	m
decimeter	dam
centimeter	km
millimeter	hm

Draw a line to match each value to the correct unit of measure.

1,000 meters	centimeter
100 meters	kilometer
10 meters	decimeter
1 meter	millimeter
.1 meter	dekameter
.01 meter	meter
.001 meter	hectometer

Name: _____

Metric System Basics

Units of Volume

Volume in the metric system is based on the standard unit called the *liter*. All other metric units of volume are multiples or submultiples of the liter. Some of the other metric units of volume are shown below.

Name	Abbreviation	Value
kiloliter	kl or kL	1,000 liters
hectoliter	hl or hL	100 liters
dekaliter	dal or daL	10 liters
liter	l or L	1 liter
deciliter	dl or dL	.1 liter
centiliter	cl or cL	.01 liter
milliliter	ml or mL	.001 liter

The metric system is based on the decimal system (base ten). When one unit of measure is compared to the next unit of measure in the metric system, it is 10 times more or 10 times less than the next unit. From this you can see that a liter is 10 times more than a deciliter, 100 times more than a centiliter, and 1,000 times the volume of a milliliter (10 x 10 x 10).

1 kiloliter (kl) = 10 hectoliters (hl)

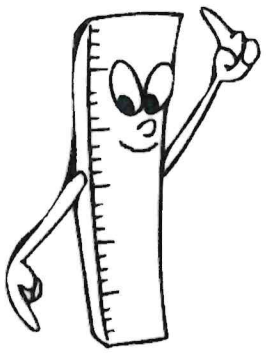
1 hectoliter (hl) = 10 dekaliters (dal)

1 dekaliter (dal) = 10 liter (l)

1 liter (l) = 10 deciliters (dl)

1 deciliter (dl) = 10 centiliters (cl)

1 centiliter (cl) = 10 milliliters (ml)



Compared to a gallon, how much is a liter (l)? Below are some of the U.S. units of volume converted to metric volumes. This will give you an idea of how the metric units compare to the U.S. units.

1 quart = .94 liter 1 gallon = 3.78 liter 1 ounce = 29.57 milliliter 1 pint = .47 liter

Name: _____

Metric System Basics
Units of Volume

Review page 3 and answer the questions below.

1. What is the base unit of measure for volume in the metric system? _____
2. How many milliliters are there in one liter? _____
3. What number system is the metric system based on? _____
4. How many deciliters are there in one liter? _____
5. A deciliter is how many more times the volume of a milliliter? _____
6. How many centiliters are in one liter? _____

Draw a line to match the abbreviation to the correct unit of measure.

kiloliter	ml
hectoliter	cl
dekaliter	dl
liter	l
deciliter	dal
centiliter	kl
milliliter	hl

Draw a line to match each value to the correct unit of measure.

1,000 liters	centiliter
100 liters	kiloliter
10 liters	deciliter
1 liter	milliliter
.1 liter	dekaliter
.01 liter	liter
.001 liter	hectoliter

Name: _____

Metric System Basics

Units of Weight

Weight in the metric system is based on the standard unit called the *gram*. All other metric units of weight are multiples or submultiples of the gram. Some of the other metric units of weight are shown below.

Name	Abbreviation	Value
kilogram	kg	1,000 grams
hectogram	hg	100 grams
dekagram	dag	10 grams
gram	g	1 gram
decigram	dg	.1 gram
centigram	cg	.01 gram
milligram	mg	.001 gram

The metric system is based on the decimal system (base ten). When one unit of measure is compared to the next unit of measure in the metric system, it is 10 times more or 10 times less than the next unit. From this you can see that a gram is 10 times more than a decigram, 100 times more than a centigram, and 1,000 times more than a milligram (10 x 10 x 10).

1 kilogram (kg) = 10 hectograms (hg)

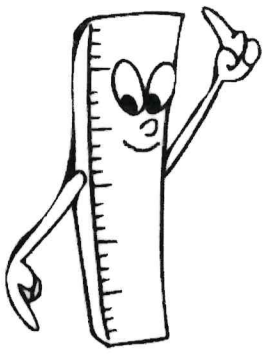
1 hectogram (hg) = 10 dekagrams (dag)

1 dekagram (dag) = 10 grams (g)

1 gram (g) = 10 decigrams (dg)

1 decigram (dg) = 10 centigrams (cg)

1 centigram (cg) = 10 milligrams (mg)



Compared to an ounce, how much is a gram (g)? Below are some of the U.S. units of weight converted to metric units of weight. This will give you an idea of how the metric units compare to the U.S. units.

1 ounce = 28.349 grams 1 pound = 453.592 grams 1 ton = 907.184 kilograms (kg)

Name: _____

Metric System Basics
Units of Weight

Review page 5 and answer the questions below.

1. What is the base unit of measure for weight in the metric system? _____
2. How many milligrams are there in one gram? _____
3. What number system is the metric system based on? _____
4. How many decigrams are there in one gram? _____
5. A decigram is how many more times the weight of a milligram? _____
6. How many centigrams are in one gram? _____

Draw a line to match the abbreviation to the correct unit of measure.

kilogram	mg
hectogram	cg
dekagram	dg
gram	g
decigram	dag
centigram	kg
milligram	hg

Draw a line to match each value to the correct unit of measure.

1,000 grams	centigram
100 grams	kilogram
10 grams	decigram
1 gram	milligram
.1 gram	dekagram
.01 gram	gram
.001 gram	hectogram