

Heat and Changes in Matter

Marie Porter

3rd grade

WVES

3-4.1, 3-4.2, 3-4.3, 3-4.4

Observable Properties

sight

① color

② shape

③ size

④ luster

touch

① hardness/
softness

② texture

smell

① odor present

no odor

Observable Properties

sight

① color

② shape

③ size

④ luster

touch

① hardness/
softness

② texture

smell

① odor present

no odor

Measurable Properties

Characteristics that you can measure with a tool.

M. P.	a. <u>length</u>	{ ruler, tape measurer, yard/meter stick
	b. <u>mass</u>	{ balance scale
	c. <u>volume</u>	{ syringe, beaker graduated cylinder *
	d. <u>temperature</u>	{ thermometer.

Mass- the amount of matter in an object

- a balance

-heavier

Volume- the amount of space an object takes up

-beaker, graduated cylinder, or graduated syringe

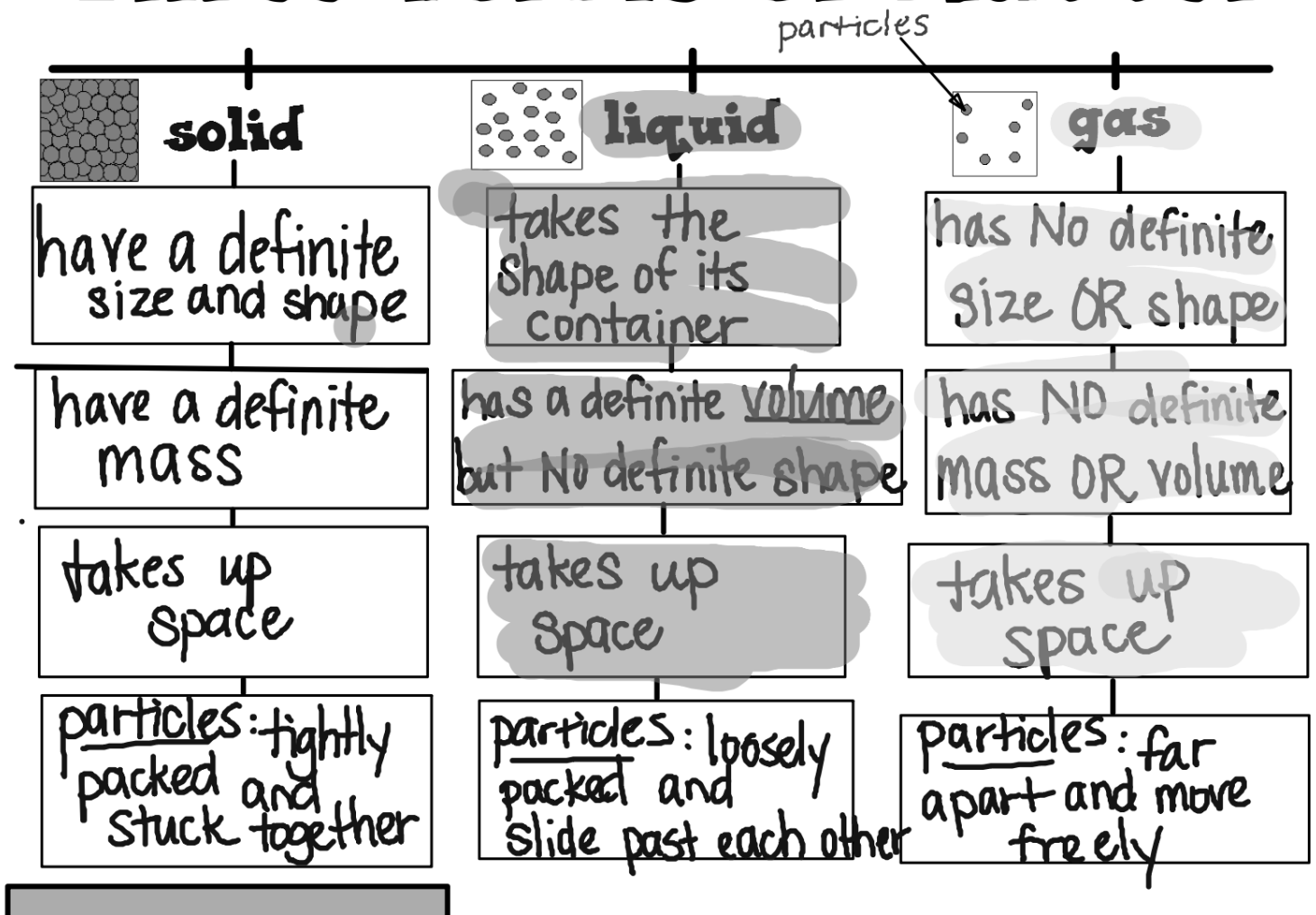
-larger

5. Matter: Anything that takes up space.

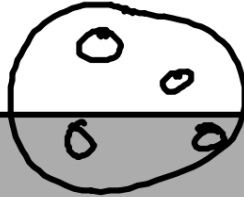
3 forms of matter

- ~ solid : shape, size, takes up space, mass
- ~ liquid : takes up space, volume
- ~ gas : takes up space

Three Forms of Matter



Gas



- Takes up space
 - No definite mass or volume
 - No definite shape or size
 - Particles far apart, moving freely
-

Does it have...?

Y = yes

N = no

Matter	takes up space	size	shape	mass	volume
Solid	Y	Y	Y	Y	Y
Liquid	Y	Y	N	Y	Y
Gas	Y	N	N	N	N

(that can't be changed)

Volume - Liquids

small volumes

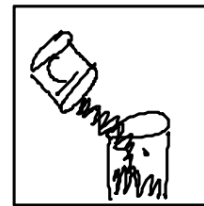
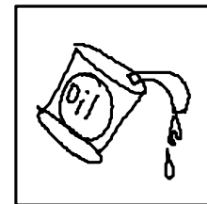
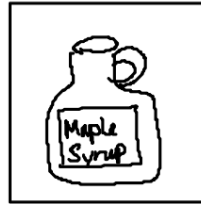
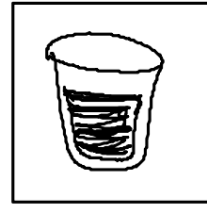
Med. and **large volumes**

pint of milk

one



rain drop



lake
ocean
swimm

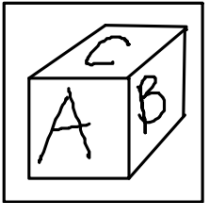
2 Lite
Gallon

Mass - Solids

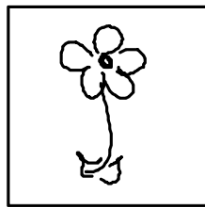
small mass

med./large mass

block

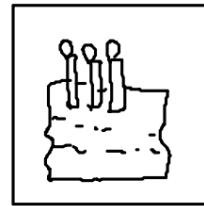


flower

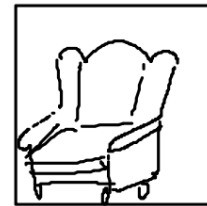


pencil

car

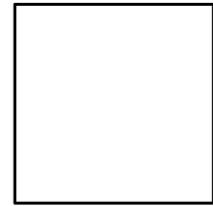
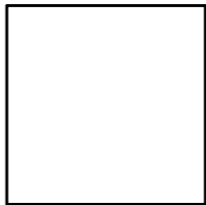
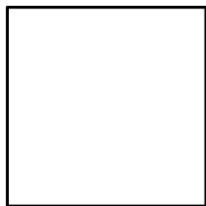
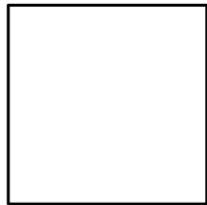
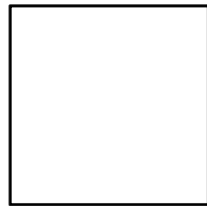
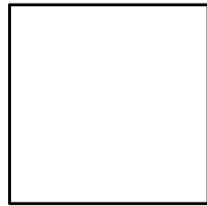
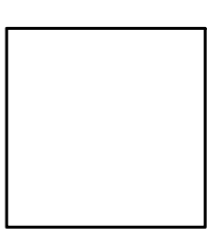


birthday cake



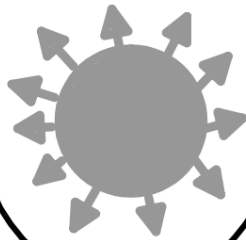
chair

**Gas - NO Mass
NO Volume**



Sources of HEAT

sun



fire



rubbing



animals



humans



electricity
when used

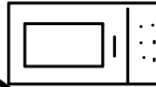


stove
oven

light bulbs



microwave



toaster



Producers of HEAT

rubbing

when objects are rubbed together, heat is produced

EXAMPLES:

hands
sticks

burning

when materials are burned, heat is produced

EXAMPLES:

wood
paper
fossil fuels
candles

using electricity

when electricity is used, heat is produced

EXAMPLES:

light bulbs
stove/ovens
toaster
heaters

How HEAT moves ...

conductors

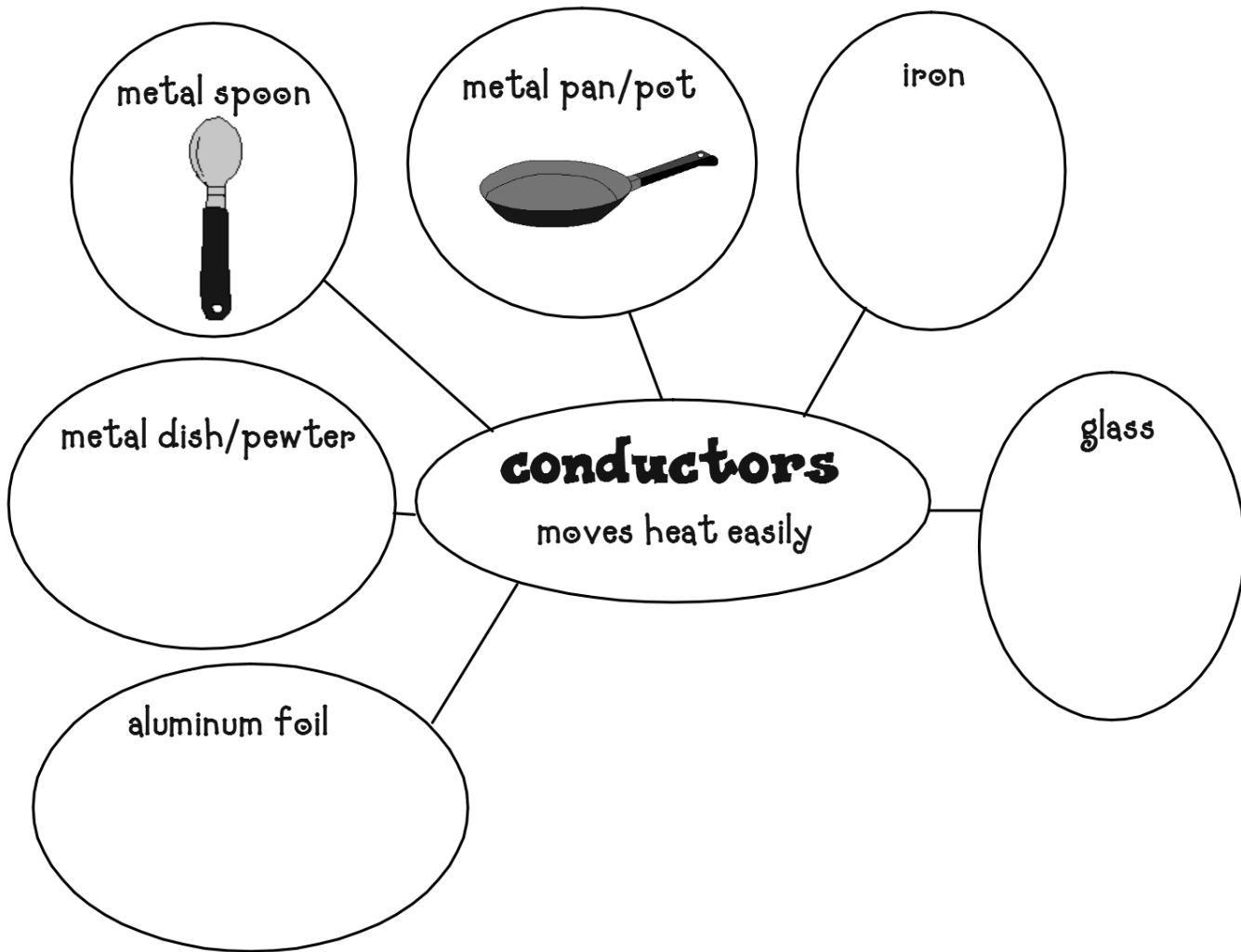
a material that allows heat to move easily through it. (quickly)

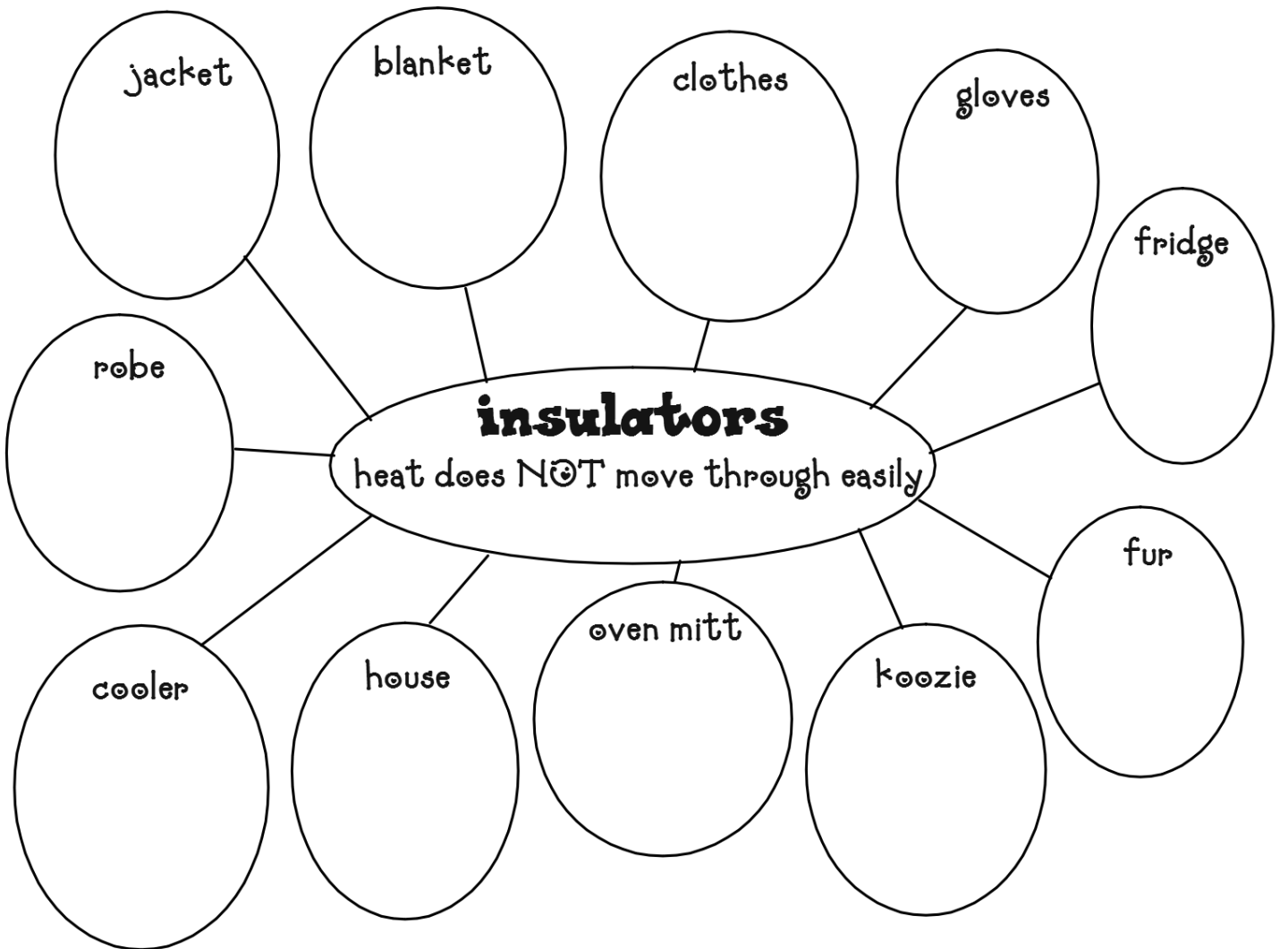
get warmer/hot quickly

insulators

a material that does NOT allow heat to move easily through it

they do NOT get warmer (quickly)





Conductors


Insulators

* = Source of HEAT

Adding Heat to Matter

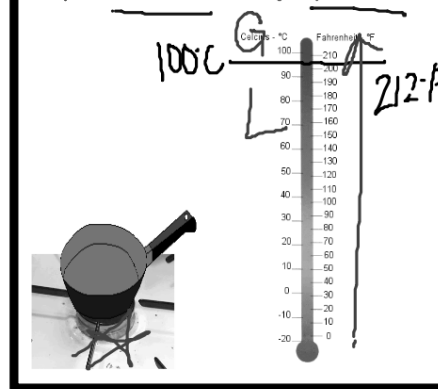
melting

l. solid \rightarrow liquid
Example:
ice melts at
32°F or 0°C



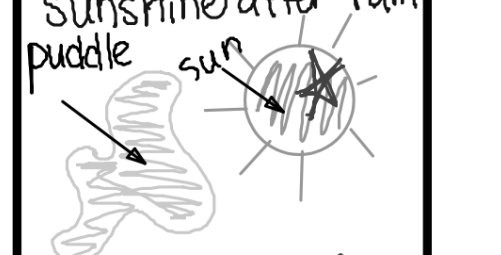
boiling

l. liquid \rightarrow gas
Example:
water boils at 212°F or 100°C

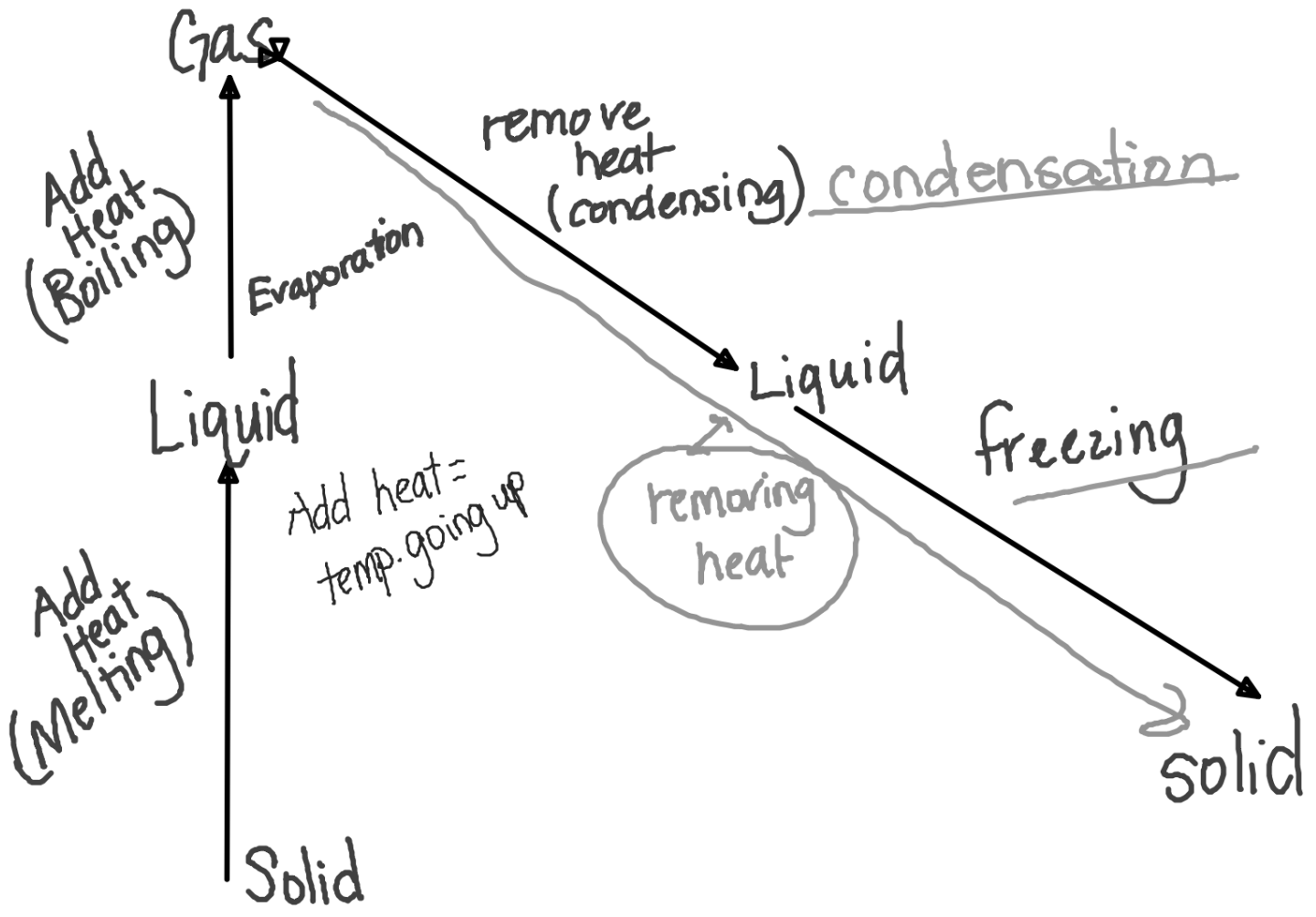


evaporation

l. liquid \rightarrow gas
Example:
• happens when
sunshine after rain
puddle

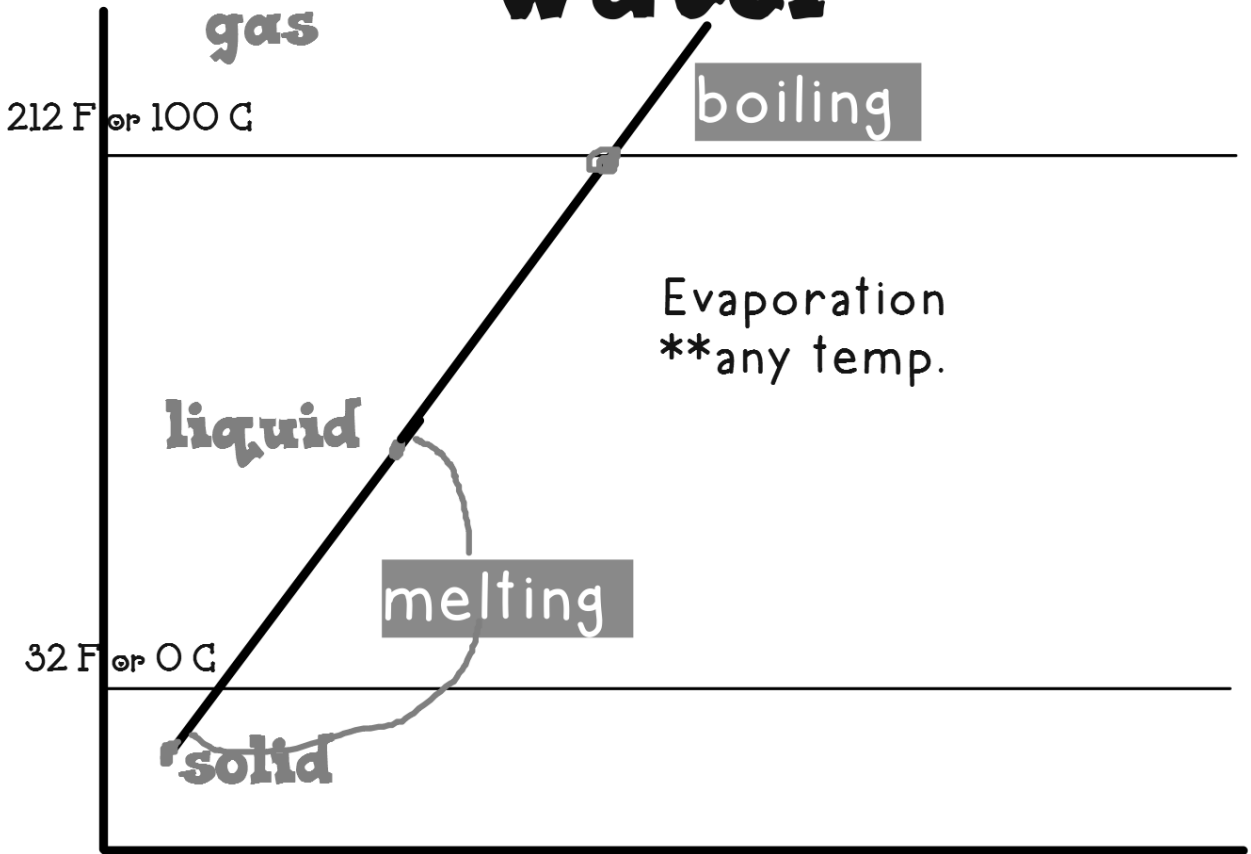


happens at
ANY temperature

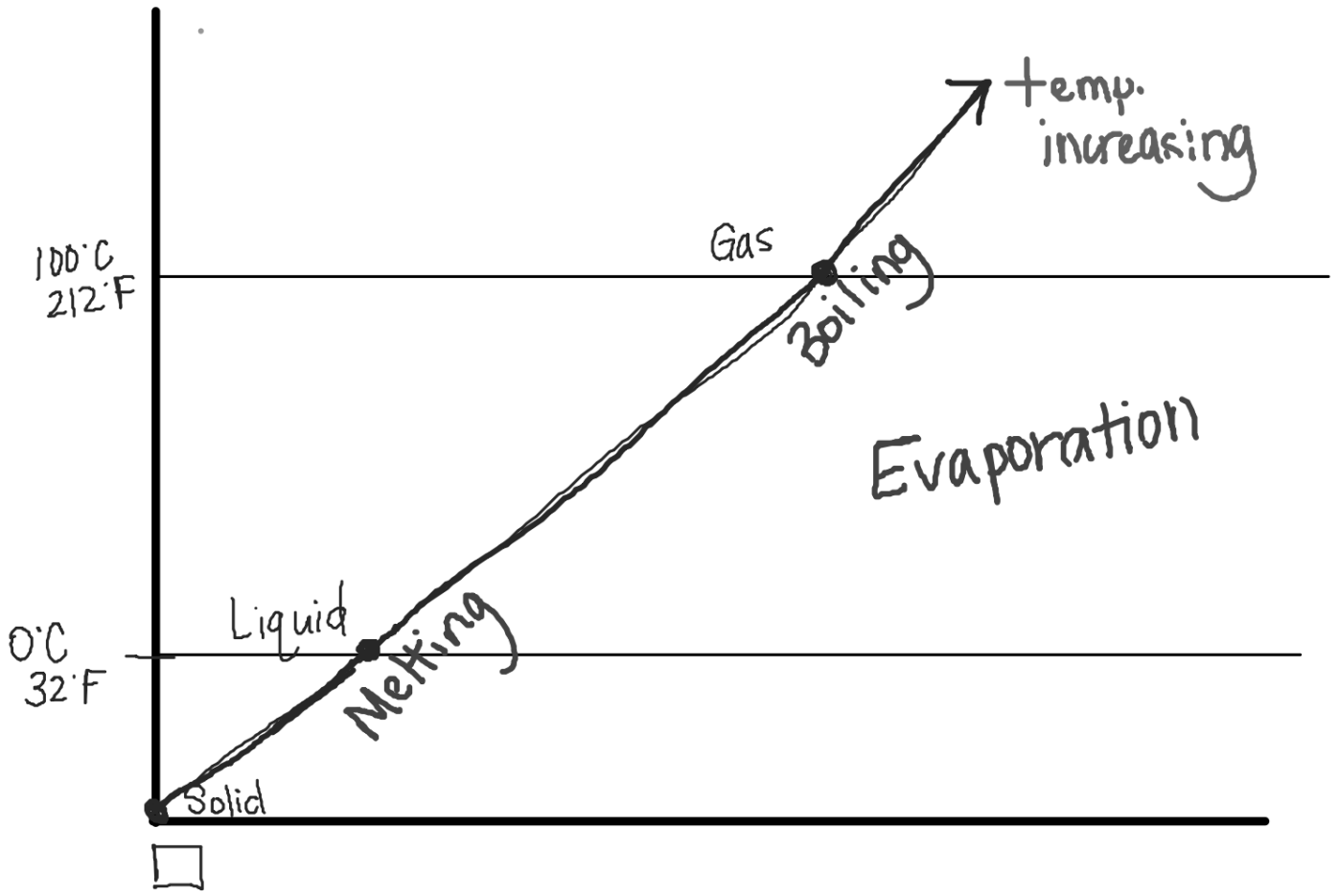


Water

t
e
m
p
e
r
a
t
u
r
e



adding heat over time



Removing Heat from Matter

freezing

l. liquid → solid

32°F or 0°C

Examples:

making ice cubes

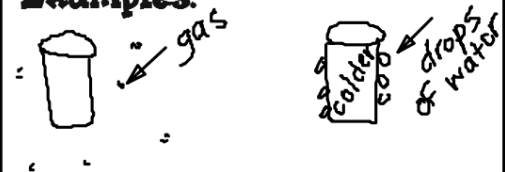


condensation
↕
condensing

l. gas → liquid

* Any temperature

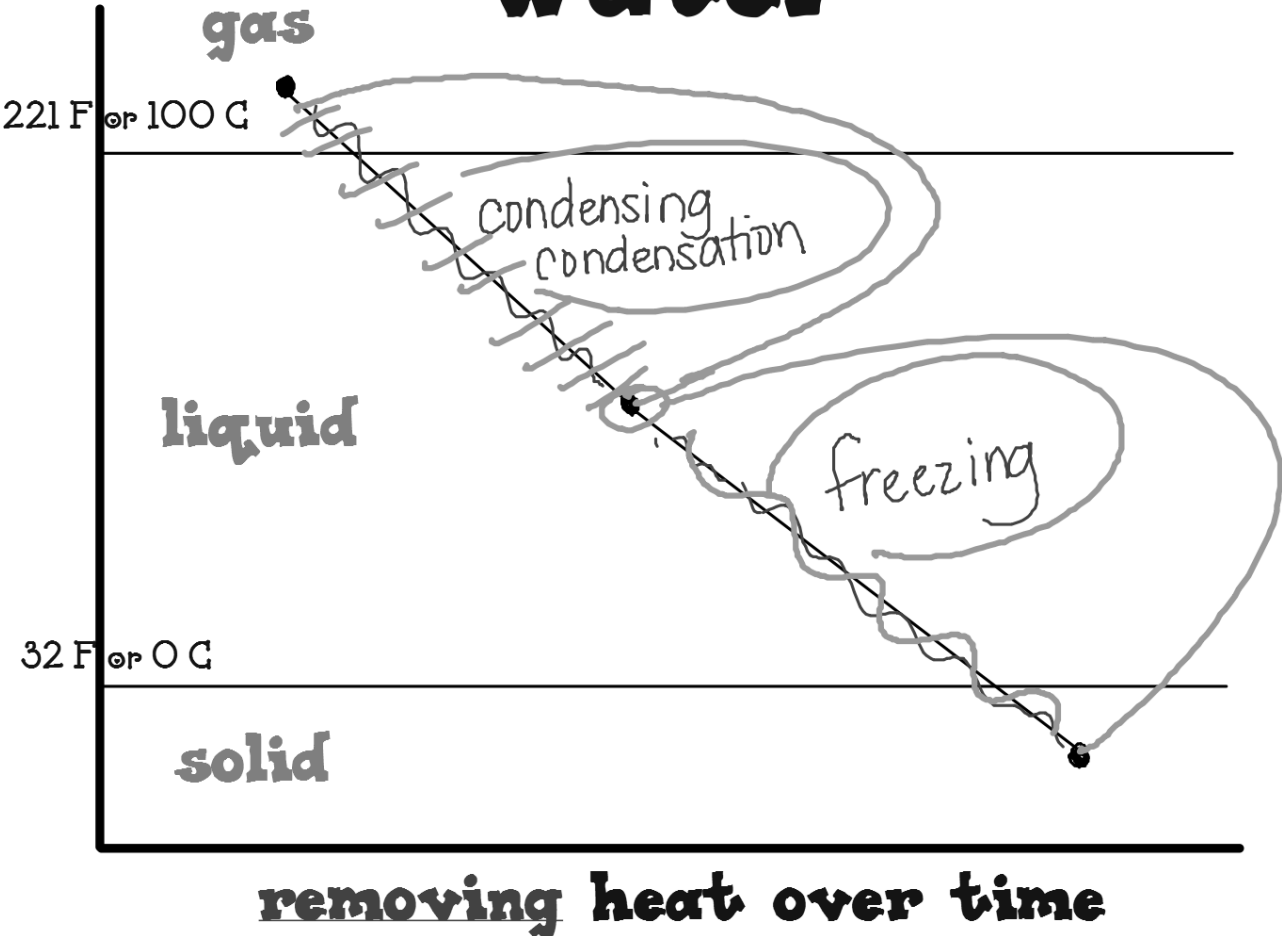
Examples:

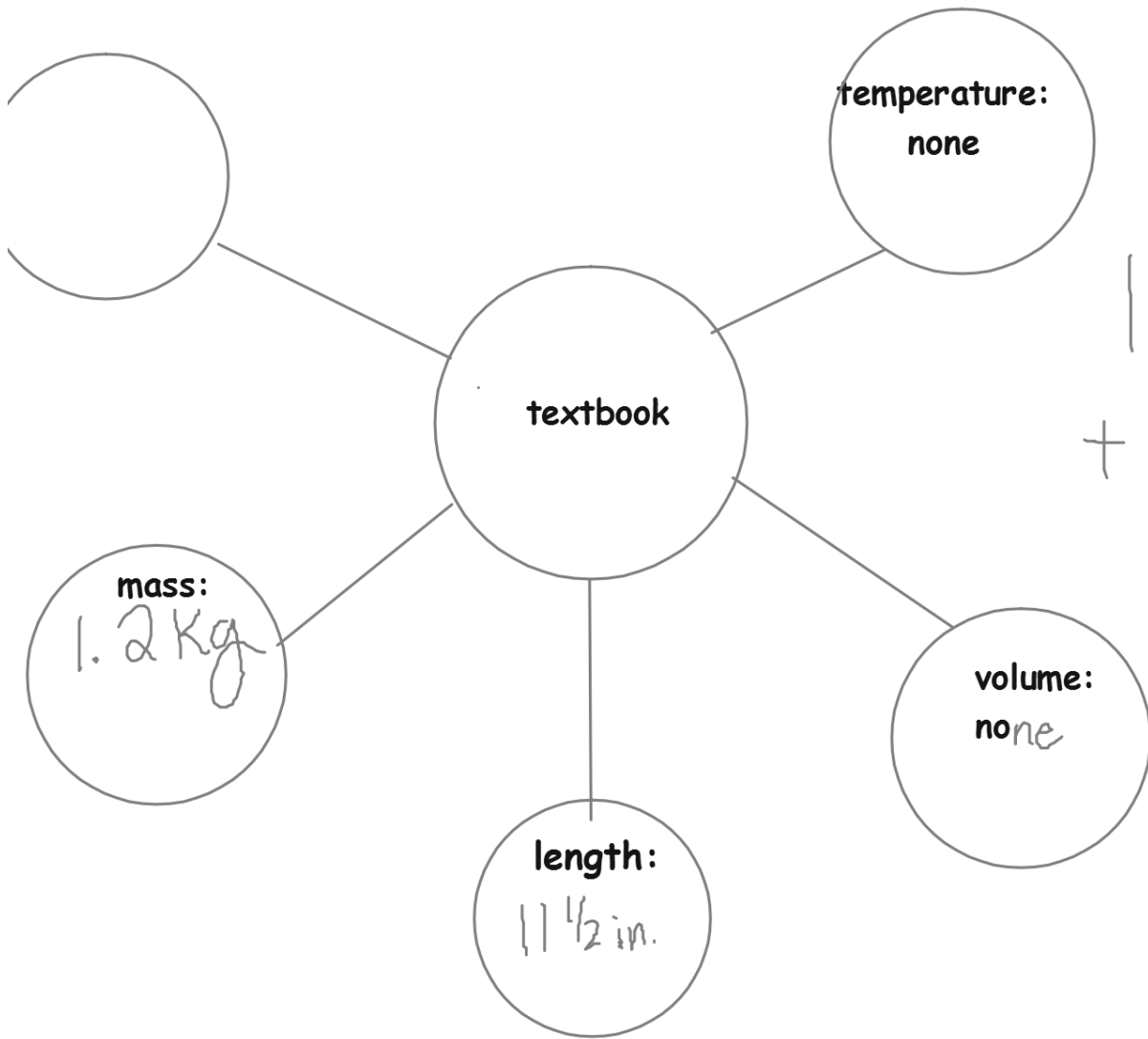


foggy
car
windows

Water

t
e
m
p
e
r
a
t
u
r
e





1 kg
+ 257 kg
1.2 kg

Get Science book out, turn to page 320. Read pages 320-323

Get out black Science binder. Find journal pages.

Set out writing journal. Begin writing everything that you have learned about matter and heat. YOu need to list at least 10 facts about matter and 10 facts about heat.

.

Removing Heat from Matter

Freezing

liquid
↓
solid

32° F and
0° C

* Removing Heat

* Occur
the temp.
must be
32° F or 0° C.

* Water into
ice or
snow

Condensation

gas
↓
liquid

212° F
100° C

* Removing heat

* Occurs
at any
temperature
* water
droplets
on glass,
window or
mirror.