Science Homework

Answers

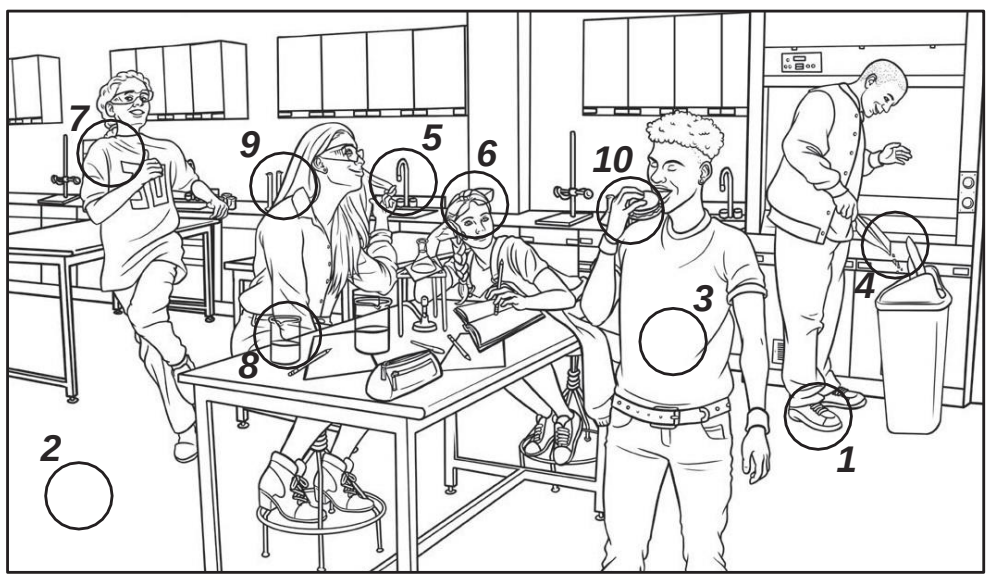
Year 7 Autumn Term 1

Remember to mark your work in a different coloured pen and complete any corrections before the due date.

Week 1 Lab Safety Rules and Tips
Answers

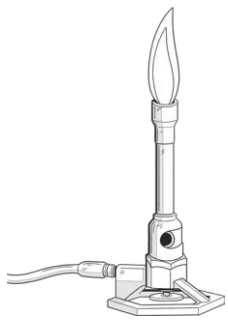
1. *It's important to wear* ***closed-toe*** *shoes when experimenting and in the lab.*
2. *Keep walkways clear of items like* ***cords*** *or bags.*
3. *Wearing an* ***apron*** *will protect you and your clothes.*
4. ***Sharp*** *objects like lancets, syringes, or scalpel blades should be used under close* ***supervision***.
5. *Be aware of and know how to use the* ***emergency eyewash*** *and* ***emergency shower*** *in the case of a chemical splash to the eyes or body.*
6. ***Googles*** *are required when working with any substance that may hurt your eyes.*
7. *Inform a* ***teacher*** *immediately if any accidents or injuries occur, even little ones.*
8. *If working with hot containers or equipment, always use tongs,* ***clamps***, *or heat-resistant gloves.*
9. ***Long hair*** *should be tied up to prevent any accidents.*
10. ***Food and drink*** *should not be consumed in the lab or during experiments.*

- ***Answers may vary slightly.***

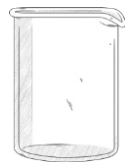


Week 2 Naming Scientific Equipment
Answers

Give the name of each piece of scientific equipment.



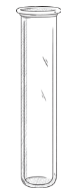
Bunsen burner



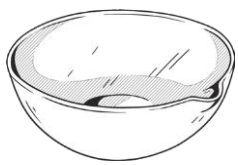
beaker

measuring cylinder

test tube



boiling tube



evaporating basin

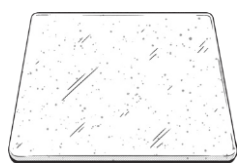
tripod

funnel

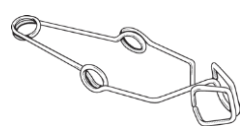
clamp stand, boss and clamp

conical flask

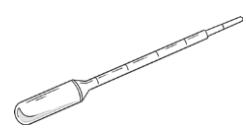
gauze



heatproof mat



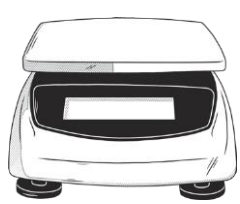
test tube holder



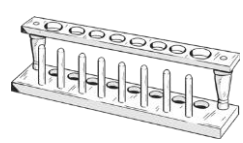
pipette

tongs

stop watch



top-pan balance



test tube rack

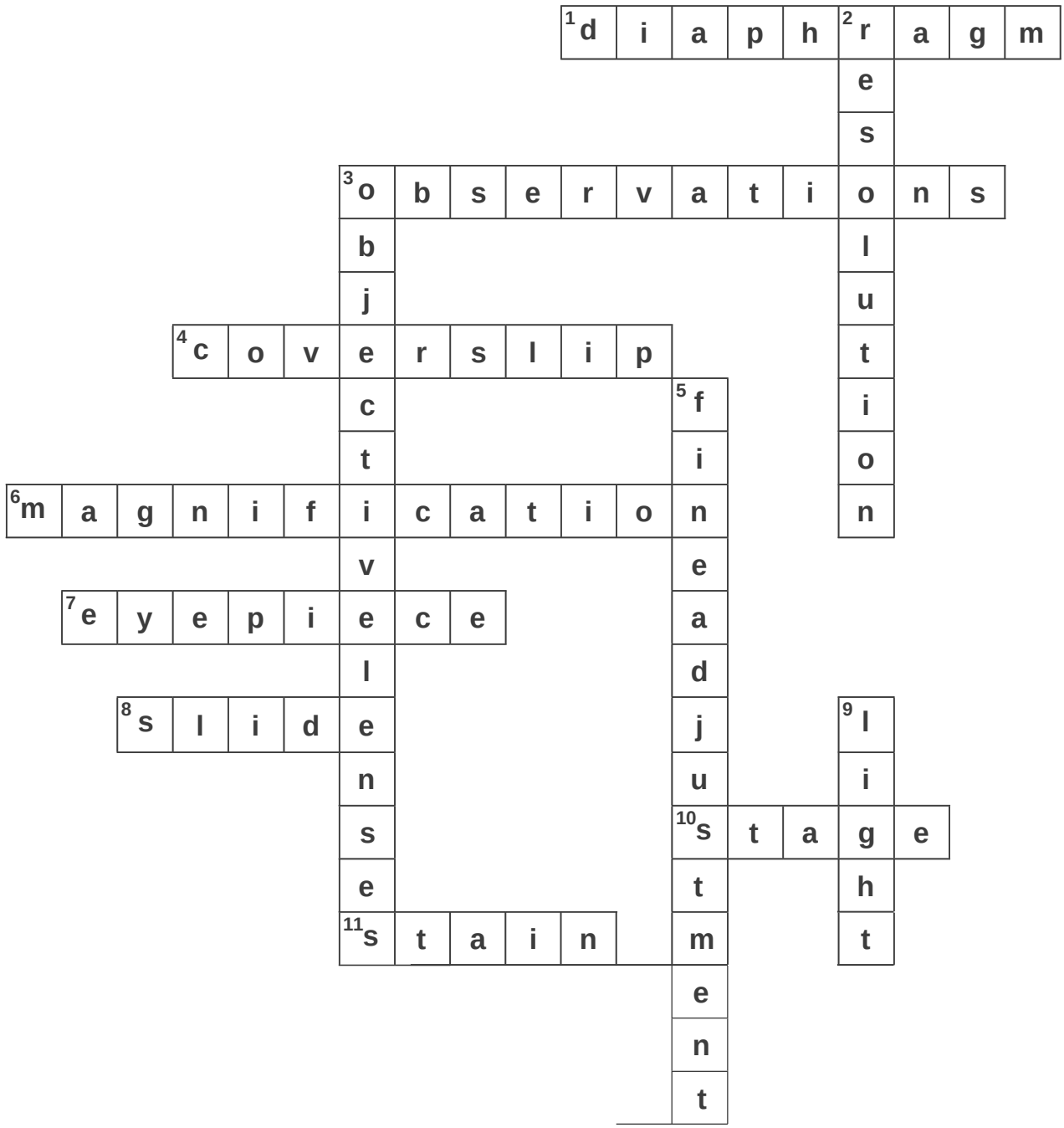
spatula

safety goggles

Week 3

Seneca Assignment

Week 4 Microscopy Crossword
Answers



BEYOND SCIENCE

Across

1. The part of a light microscope used to control the amount of light that passes through the specimen. (9) **diaphragm**

3. A microscope helps you to make these about objects that are too small to see with the naked eye. (12) **observations**

4. A small, thin piece of glass that is placed over the specimen. (9) **coverslip**

6. The degree to which an object is made to appear bigger. (13) **magnification**

7. The lens at the top of the microscope that you look through. (8) **eyepiece**

8. A rectangular piece of glass on which a specimen is placed. (5) **slide**

10. The flat surface of a light microscope on which a slide is placed. (5) **stage**

11. A substance that is added to a specimen to make it more clearly visible. (5) **stain**

Down

2. The smallest interval measurable between two points on an image. (10) **resolution**

3. These can be rotated between to change the magnification. (9,6) **objective lenses**

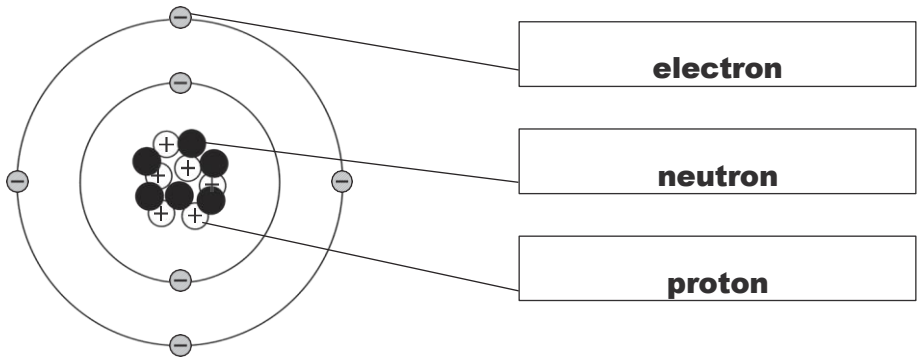
5. This knob is used to refine the resolution, making the image sharp instead of blurry. (4,10) **fine adjustment**

9. This is used to illuminate the specimen in some types of microscope. (5) **light**

Week 5 Atoms, Elements and Compounds **Answers**

Atoms are tiny particles which make up all substances and matter. They contain a central nucleus made up of neutral neutrons and positively charged protons. Negatively charged electrons orbit the nucleus.

1. Label the diagram of the atom.



An element is made up of only one type of atom. There are around 100 different elements, which can all be found on the periodic table.

A compound is formed when two or more different atoms are chemically bonded together. For example, water (H_2O) is a compound made up of hydrogen and oxygen atoms. Compounds can be represented by their chemical formula; this shows the number of atoms of each element present in the compound.

2. Complete the table below. The first row has been done for you.

   You might find it helpful to use a periodic table for this question.

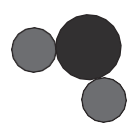
Name of Substance	Chemical Formula	Number of Atoms of Each Element
water	H_2O	2 × hydrogen, 1 × oxygen
magnesium oxide	**MgO**	1 × magnesium, 1 × oxygen
carbon	C	**1 × carbon**
oxygen	**O_2**	2 × oxygen
methane	CH_4	**1 × carbon, 4 × hydrogen**
iron	**Fe**	1 × iron
glucose	$C_6H_{12}O_6$	**6 × carbon, 12 × hydrogen, 6 × oxygen**
hydrogen chloride	**HCl**	1 × hydrogen, 1 × chlorine
sulfur dioxide	SO_2	**1 × sulfur, 2 × oxygen**

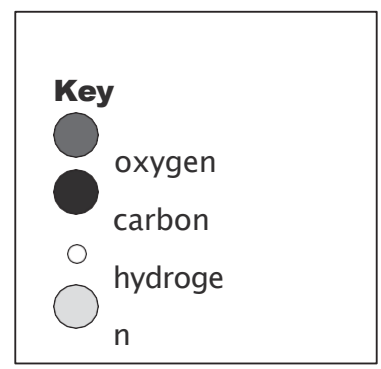
3. Sort the following substances into the table. Each substance should be written into one column only.

aluminium
boron
carbon dioxide
calcium carbonate
copper sulfate
hydrogen
hydrogen peroxide
magnesium
sodium chloride
sulfur
tin
zinc oxide

Elements	Compounds
aluminium	**carbon dioxide**
boron	**calcium**
hydrogen	**carbonate copper**
magnesiu	**sulfate hydrogen**
m sulfur	**peroxide sodium**
tin	**chloride zinc**
	oxide

4. For each of the substances below, draw a particle diagram to represent one molecule of the substance. Use the key shown below. The first one has been done for you.

wate r H_2O	carbon dioxide CO_2	ammoni a NH_3
		
oxyge n O_2	hydroge n H_2	
		



Week 6 Forces and Their Effects
Answers

Forces are measured in newtons, using a newton meter. The table below lists some forces and their descriptions.

Force	Description
friction	The force between two surfaces that are sliding, or trying to slide, past each other.
air resistance	The force that acts in the opposite direction to an object's movement as it moves through the air.
reaction	The force that supports an object on a solid surface.
tension	The force transmitted through a rope, string or wire when pulled by forces acting from opposite ends.
upthrust	The upward force exerted by a fluid on an object floating in it.
gravitational force	The force acting on an object due to gravity.
magnetic force	The force exerted by a magnetic field on a magnetic material.
electrostatic force	The force that acts between two charged objects.

1. Name the force that is acting in each of the situations described below.

The force of the water acting on a boat that keeps it afloat.	**upthrust**
The force of the table acting on a cup that is resting on the table.	**reaction**
The force that keeps a car on the ground.	**gravitational force**
The force that holds up a decoration that is hanging from a string.	**tension**
The force that causes a paperclip to be attracted to a magnet.	**magnetic force**
The force of the air acting on a moving bus.	**air resistance**
The force that holds together sodium and chloride ions to make salt.	**electrostatic force**
The force of the doormat on your shoes when you wipe your feet.	**friction**

We can't see forces but we can see their effects on objects.

Forces can make objects change speed, direction or even shape.

2. Draw some diagrams in the space below to help you remember the three things that forces can do.

Student drawings will vary.

Week 7

Seneca assignment

Week 8 Making a Model Cell

Answers

Student answers will depend on the model they have made. The correct sub-cellular structures for each cell type are shown below.

Animal Cell

Sub-Cellular Structure	Present (✓or ×)
cell membrane	✓
cell wall	×
chloroplast	×
cytoplasm	✓
mitochondria	✓
nucleus	✓
permanent vacuole	×
ribosome	✓

Plant Cell

Sub-Cellular Structure	Present (✓or ×)
cell membrane	✓
cell wall	✓
chloroplast	✓
cytoplasm	✓
mitochondria	✓
nucleus	✓
permanent vacuole	✓
ribosome	✓

Week 9 Particle Model **Answers**

1. Label the states of matter represented by each of the particle diagrams below. [3]

Solid **Gas** **Liquid**

2. Using the diagrams in question 1 to help you, explain why:

a. A solid cannot be squashed. [2]

- **particles are tightly packed, with strong bonds in between**
- **cannot be pushed any closer together**

b. Liquids and gases can flow. [2]

- **particles are more weakly bonded together**
- **can slide over and past one another (flows)**

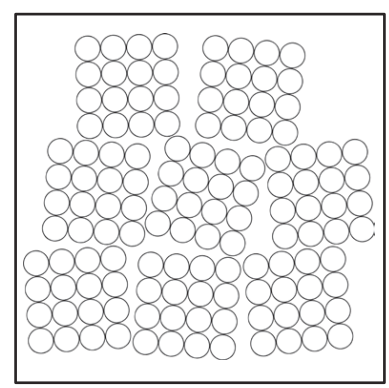
c. Gases do not have a fixed volume. [2]

- **particles have very high energy level, move rapidly**
- **particles spread to fill the space of the container**

d. Liquids do not have a fixed shape. [2]

- **particles are more weakly bonded together**
- **can slide over and past one another (flows)**
- **particles fill the shape of the bottom of their container**

3. Is sand a solid, liquid or gas? Explain your answer. Draw a particle diagram to help show your answer. [4]

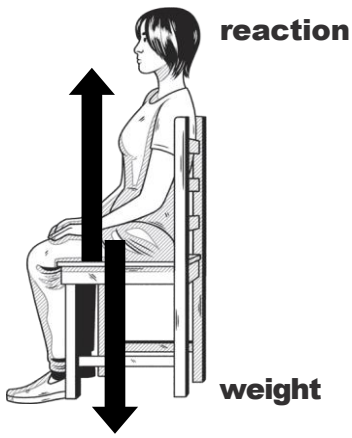


- **sand is solid**
- **acts like a liquid**
- **many small solid objects together**
- **individual grains are solid**
- **many grains behave like particles of a liquid object**

3 marks for any points in description, 1 mark for a relevant and clearly drawn particle diagram

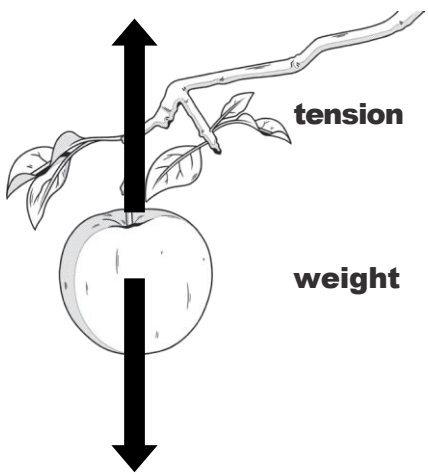
Week 10 Force Diagrams **Answers**

Add force arrows to the diagrams below. Label the arrows with the force and add a description that says whether the forces are balanced or unbalanced.



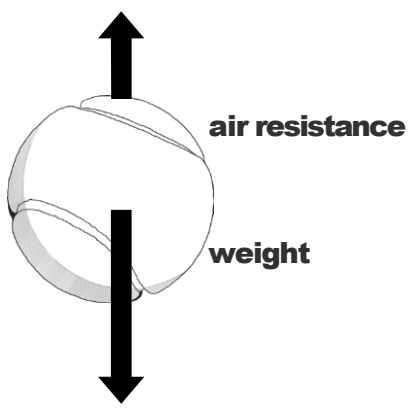
A person sitting on a chair.

The weight of the person and the reaction force of the chair are balanced.



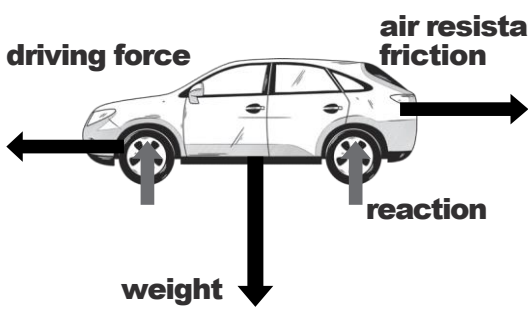
An apple hanging on a tree.

The weight of the apple and the tension of the branch are balanced.



A ball accelerating downwards.

The weight of the ball is larger than the air resistance on the ball so the forces are unbalanced.



A car travelling at a constant speed.

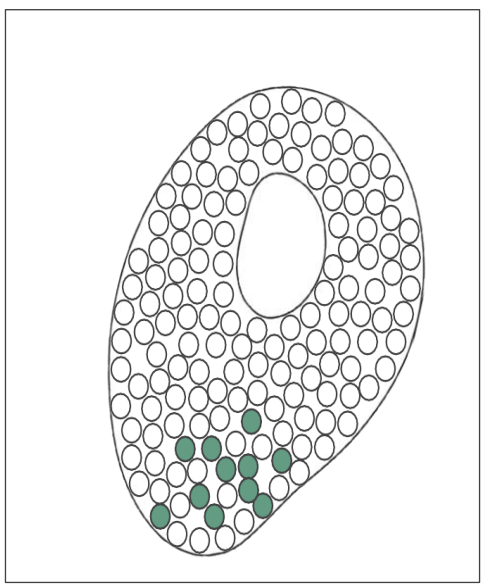
The weight of the car and the reaction force of the ground are balanced.

The driving force of the engine and the resistive forces (air resistance and friction) are balanced.

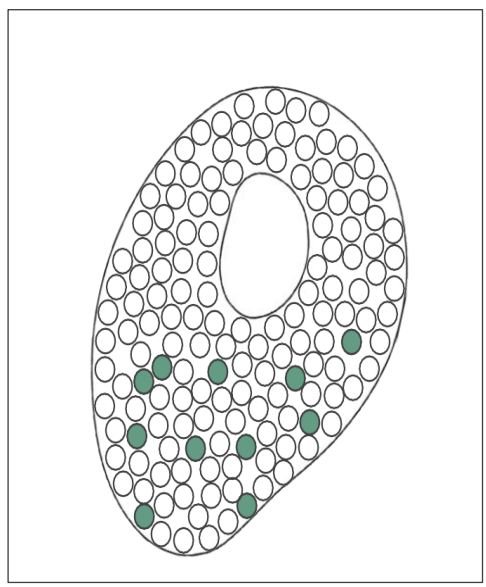
Week 11

Seneca Assignment

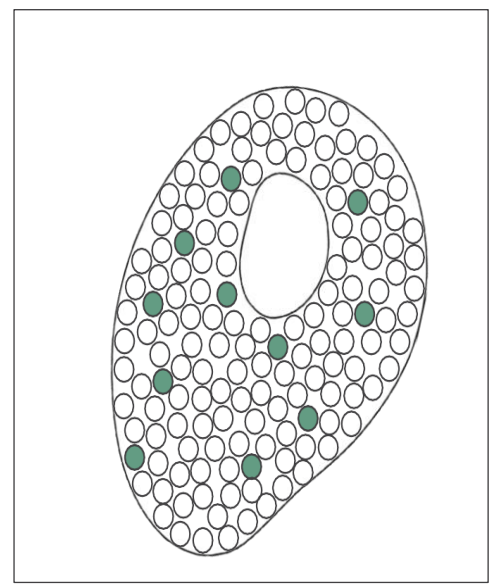
Week 12 Diffusion Storyboard **Answers**



The oxygen molecules are at a higher concentration at the bottom right of the cell and a lower concentration in the rest of the cell.



The net movement of oxygen molecules is from a higher concentration to a lower concentration.



The oxygen molecules continue to move randomly and eventually become evenly spread throughout the cytoplasm.

Week 13 Separation Techniques **Answers**

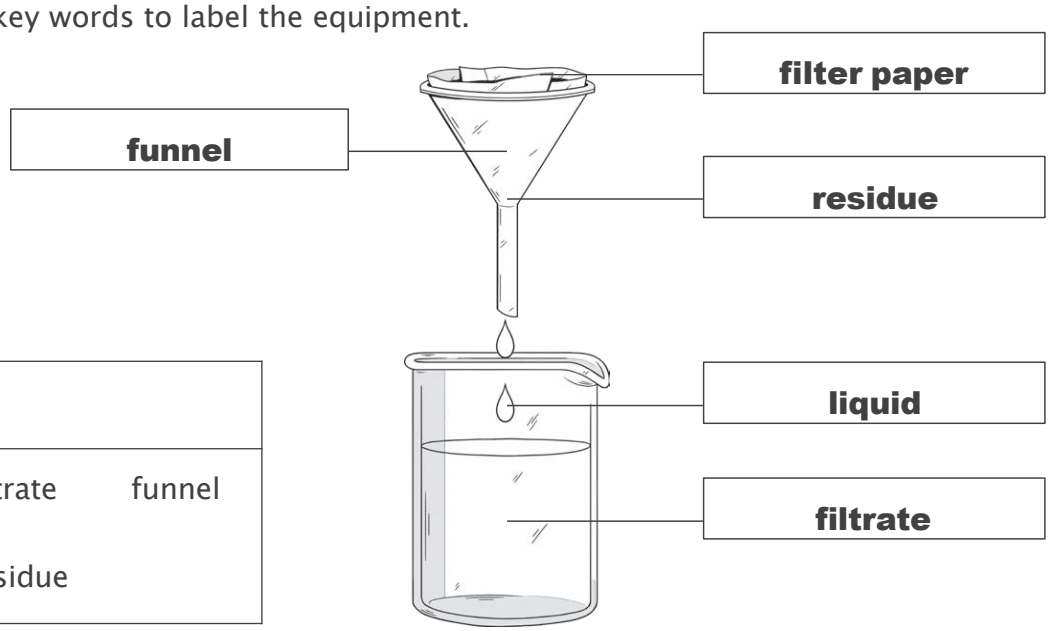
Match and Draw

Draw **one** line from each key word to the correct definition.

solute	a mixture of the solid and liquid
solvent	a substance that will dissolve in a liquid
solution	a solid that dissolves in a liquid
soluble	a liquid in which the solid dissolves

Filtration

Use the following key words to label the equipment.

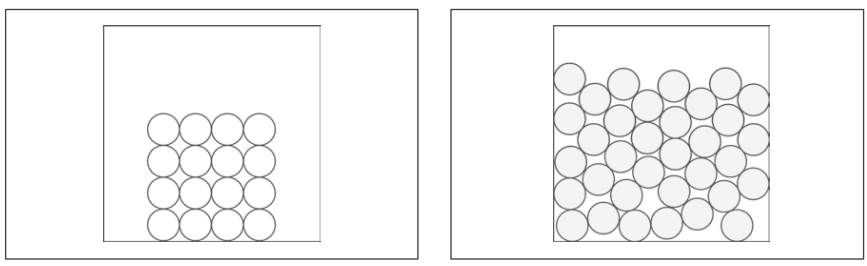


Key Words

filter paper	filtrate	funnel
liquid	residue	

Dissolving

Complete the boxes below to show the particles in salt, water and saltwater.



salt | water | saltwater

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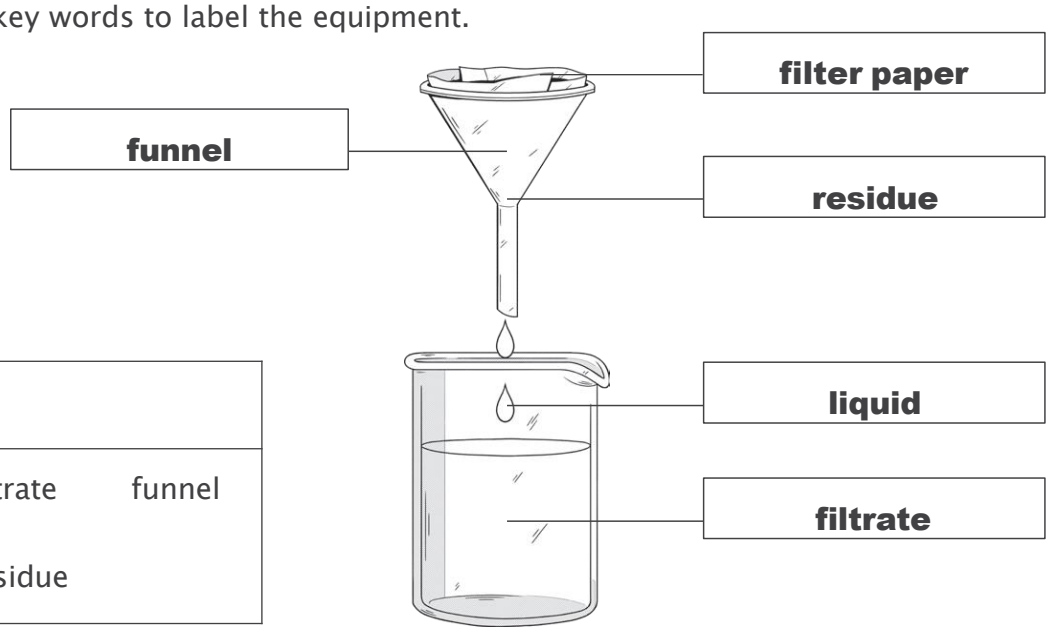
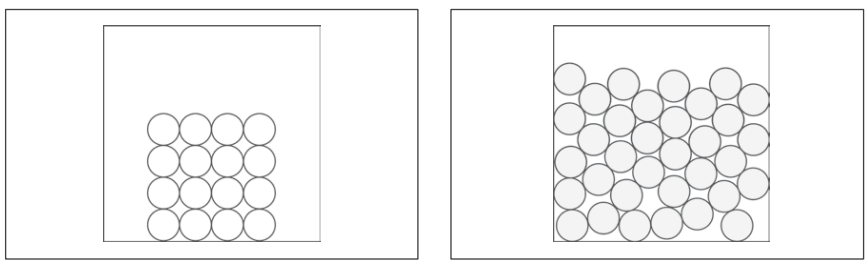


Key Words

filter paper	filtrate	funnel
liquid	residue	

Dissolving

Complete the boxes below to show the particles in salt, water and saltwater.

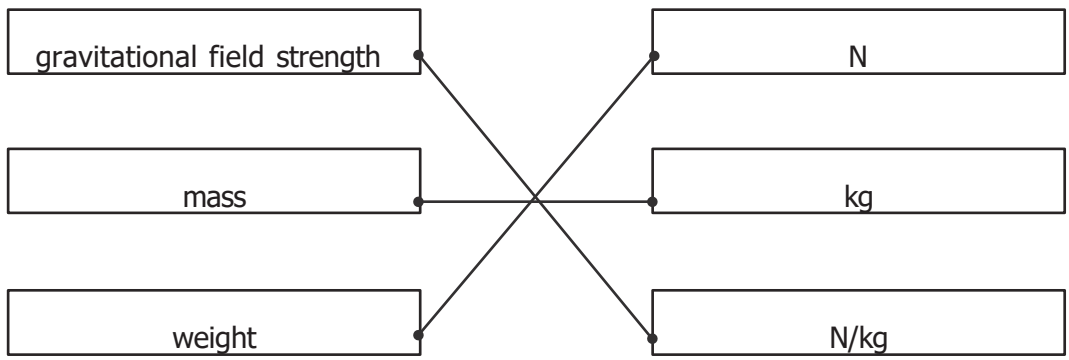


salt | water | saltwater

Week 14 Weight Mass and Gravity
Answers

1. Draw an arrow on the diagram below to show the direction of the force of gravity on the mouse.

2. Draw **one** line from each variable to the correct unit of measurement.



3. The mass of some objects is shown below.
The gravitational field strength on Earth is approximately 10N/kg.
Calculate the weight of the objects on Earth.

Use the equation:
weight = mass × gravitational field strength

mass = 1kg

weight = 1kg × 10N/kg

weight = **10**N

mass = 0.02kg

weight = 0.02kg × 10N/kg

weight = **0.2**N

mass = 0.06kg

weight = 0.06kg × 10N/kg

weight = **0.6**N

4. The mass of the Moon is smaller than the mass of Earth.

a) Choose **two** answers from the box below to complete the sentences below.

greater than	equal to	smaller than

The gravitational field strength on Earth is **greater than** the gravitational field strength on the Moon.

If an astronaut travelled to the Moon, their weight would be **smaller than** their weight on Earth.

b) An astronaut has a mass of 80kg. On the Moon, they have a weight of 128N. Calculate the gravitational field strength on the Moon.

Use the equation:

gravitational field strength = weight ÷ mass

gravitational field strength = 128 ÷ 80

= 1.6

gravitational field strength = **1.6**N/kg