Name	Science Mixtures 1 – Classifying Mixtures	Number Date

All around us, there are many **mixtures**, almost everything is a mixture! Even air for example! Let's talk more about them!

What do you think a mixture is?

……..

……..

1. Classifying mixtures

Let's make mixtures and study them. Your teacher has gotten ready many different materials. Mix some together and fill out this table with what you observed.

What did you mix?	What did you observe?

Name	Science Mixtures 1 – Classifying Mixtures	Number Date

If after mixing some components together, they are no longer identifiable, they formed a ***homogeneous*** mixture.

If some components are still identifiable even after mixing them together, this is a ***heterogeneous*** mixture.

Some materials were in the ***solid*** state, and others in the ***liquid*** state. ***Gaseous*** materials can also be mixed.

A good way to classify mixtures is to use these new words. Fill out this table with examples for the different types of mixtures.

Type of mixture	Homogeneous	Heterogeneous
Solid-Solid		
Liquid-Liquid		
Gas-Gas		
Solid-Liquid		
Solid-Gas		
Liquid-Gas		

Name	Science Mixtures 2 – Mass and Volume	Number Date

2. Mass, and volume

While making mixtures, you may have noticed that you could make both homogeneous and heterogeneous mixtures with the same components depending on the quantities you mixed.

Solubility is the maximum mass of a component that can dissolve in a specific volume of liquid to form a homogeneous mixture.

Mass (m) is the measure of how much matter is in an object. Its units are kilograms (kg) or grams (g). **Volume (V)** is the measure of how much three-dimensional space an object occupies. Its units are cubic decimeters (dm^3), cubic centimeters (cm^3), liters (L), or milliliters (mL).

Both mass and volume can be linked. Weigh a certain volume of different materials and write down your data. Make sure to write down the units! (Don’t forget to put your scale to zero!)

What did you weight?	What volume?	What mass?

Name	Science Mixtures 2 – Mass and Volume	Number Date

Let's focus on liquids a bit more. Weigh the same volume of two different liquids. Do they have the same mass?

Liquid 1 = ……. Volume = ……. Mass 1 = ……..

Liquid 2 = ……. Volume = ……. Mass 2 = ……..

…….…….…… is …….…… heavy than ……..…

Now let's do the opposite. Measure the volume of the same mass of two liquids. Do they have the same volume?

Liquid 1 = ……. Mass = ……. Volume 1 = ……

Liquid 2 = ……. Mass = ……. Volume 2 = ……

…….…….…… takes …….…… space than ……..…

Weigh exactly 1 L of water. How much does it weigh?

……..

What did you notice? What connection did you find between mass (kg) and volume (L)?

……..

Name	Science Mixtures 2 – Mass and Volume	Number Date

Can we change the volume units? Find containers with different volumes that can hold 1 L of water. Write down the volumes and containers you found.

Container	Volume	Does exactly 1 L of water fit?

Try fitting 1 L in a dm^3 volume. Does it work?

……..

Overall, 1 L of water = …… kg = …… dm^3.

Name	Science Mixtures 3 – Scientific Protocol	Number Date

3. Writing a scientific protocol

Now that you understand homogeneous, heterogeneous mixtures, solid, liquid, gas materials, mass, and volume. Pick one of the mixtures (e.g. solid-liquid homogeneous) you made

and write a scientific protocol (precise instructions) so your friends can replicate your mixture.

Title: ……

The aim of this protocol is ……

……..

Equipment:

- ……..
- ……..
- ……..
- ……..
- ……..

Name	Science Mixtures 3 – Scientific Protocol	Number Date

Procedure:

1. ……..

2. ……..

3. ……..

4. ……..

5. ……..

Notes/Comments about your protocol:

……..

……..

Were you able to replicate your friend's mixture?

……..

……..

Name	Science Mixtures 4 - Summary	Number Date

4. Summary

A **component** is a pure material that is part of a mixture. They can be **solid**, **liquid**, **gaseous**.

A **homogeneous mixture** is the same everywhere you look at it.

A **heterogeneous mixture** has visible components.

Air is a homogeneous mixture made of nitrogen, oxygen, and other gases including carbon dioxide (CO_2).

Mass is the quantity of matter, expressed in kg or g.

Volume is the space that matter occupies, expressed in dm^3, cm^3, L, or mL.

1 L of water weighs 1 kg and is also 1 dm^3.

Name	Science Mixtures 5 - Exercises	Number Date

5. Practice further!

Exercise 1. Put a cross in the correct column for each mixture.

Mixture	Homogeneous	Heterogeneous
Water + Salt		
Rocks + Sand		
Flour + Eggs		
Ketchup + Mayonnaise		
Cooking smells + Air		
Fruit salad		
Ice cubes + Orange juice		

Exercise 2. Is air a homogeneous or heterogeneous mixture? Why? What is it made of?

……..

……..

……..

Name	Science Mixtures 5 - Exercises	Number Date

Exercise 3. Connect the elements that go together.

Mass	•	•	Mixture components are no longer visible
Component	•	•	Space matter takes up
Homogeneous	•	•	Quantity of matter
Volume	•	•	Mixture components are visible
Heterogeneous	•	•	Solid, liquid, or gaseous materials that are part of a mixture

Exercise 4. True or false? If it's false, correct it.

- Objects with the same mass can have different volumes. …...

……..

- Objects with the same volume can have different masses. …..

……..

- Objects with the same volume always have the same mass. ..

……..

Name	Science Mixtures 5 - Exercises	Number Date

Exercise 5. Use your mixture worksheets to define the following words:

- Component: ……..……

……..

- Volume: ……..……

……..

- Oxygen: ……..

……..

- Mass: ……..……

……..