



Integrated Science

States of Matter and Cells



What you'll learn today:

- Understand the importance of studying Integrated Science
- Explain the properties of the states of matter
- Draw simple diagrams to show the structure of unspecialised plant and animal cells;
- Explain the function of the cell wall, cell membrane, nucleus, chromosomes, cytoplasm, ribosomes, mitochondria, vacuoles and chloroplast;
- Discuss the importance of selected microbes; and
- Explain the processes of diffusion, osmosis and active transport.

Why is the study of Science important?



What is Science anyway?

Science is the systematic study of nature and its application to us and our environment.

What are the benefits of the study of Integrated Science?

- Gain a better understanding of the world around you
- Understand diseases and disease prevention
- Understand human behaviour
- Develop logical thinking and problem solving skills
- Aid in preparations for future careers





States of Matter



What is Matter?

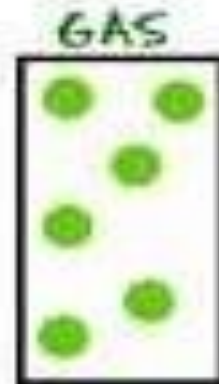
The basic definition:

- Matter is anything that has mass and occupies space.



What are the States of Matter?

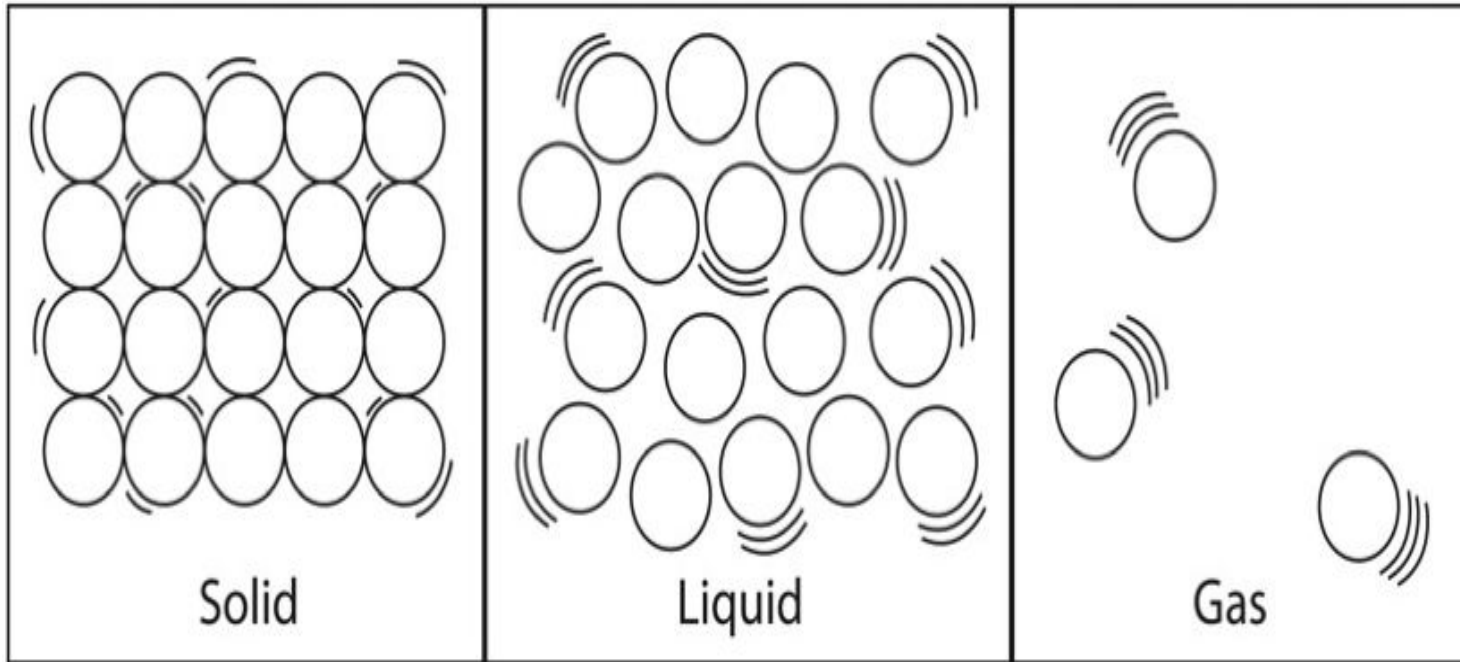
- There are three states of matter: solids, liquids, and gases.



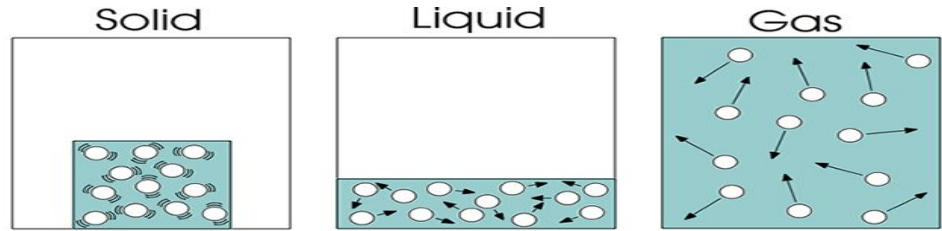
Which of these objects are solids, liquid or gases?



What is the difference between the three states of matter according to this picture?



Solids, Liquids and Gases



PROPERTY	SOLID	LIQUID	GAS/VAPOUR
Shape	Definite	Indefinite - Takes shape of container	Indefinite - Takes shape of container
Volume	Definite	Definite	Indefinite
Effect of Compression on Volume	No effect, cannot be compressed	No effect, cannot be compressed	Can be compressed
Effect of Heat on Volume	Expands, volume increases	Expands, volume increases	Expands, Volume increases
Mass	Definite	Definite	Definite

Can States change from one form to another?



Can Ice turn into Water?

What is a change in state?

- A change of state is changing a substance from one physical form to another.
- Physical change means the substance only changes it's appearance; it's still the same substance!

How do substances change state?

- A substance can change from one state to another by adding or removing ENERGY!
- One type of energy is HEAT...so we are adding heat or removing heat to change states



ice

+



heat

=



water



water

+



heat

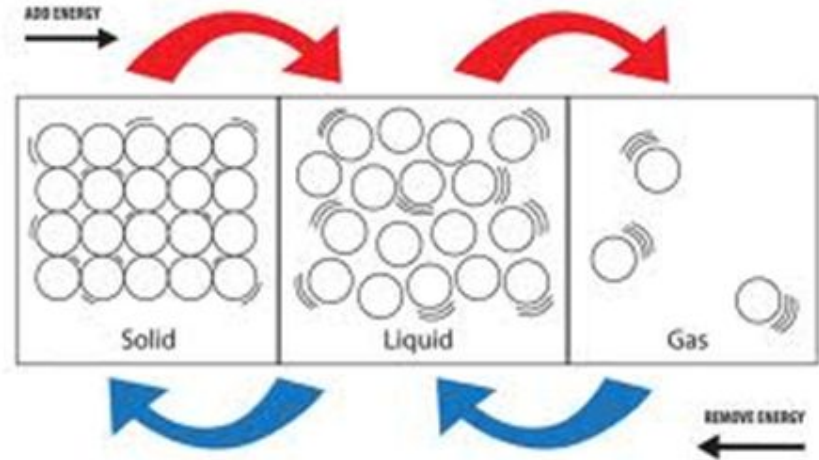
=



steam

What happens when you add energy...heat?

- The more energy (higher temperature) will make the particles move faster
- The more energy/heat will make the particles spread out more



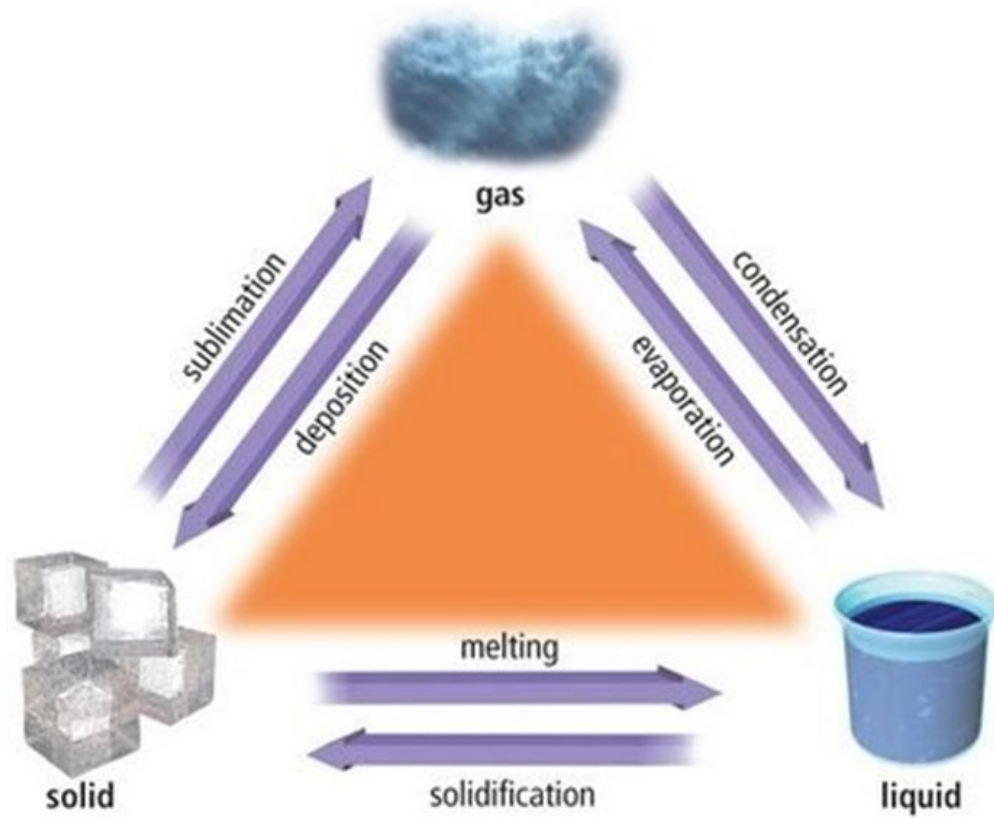


Figure 7.5A Changes of state



State Changes Recap

Melting: The change of a solid to a liquid.

Freezing: The change of a liquid to a solid.

Evaporation: The change of a liquid to gas.

Condensation: The change of a gas to a liquid.

Sublimation: The change of a solid directly to a gas.

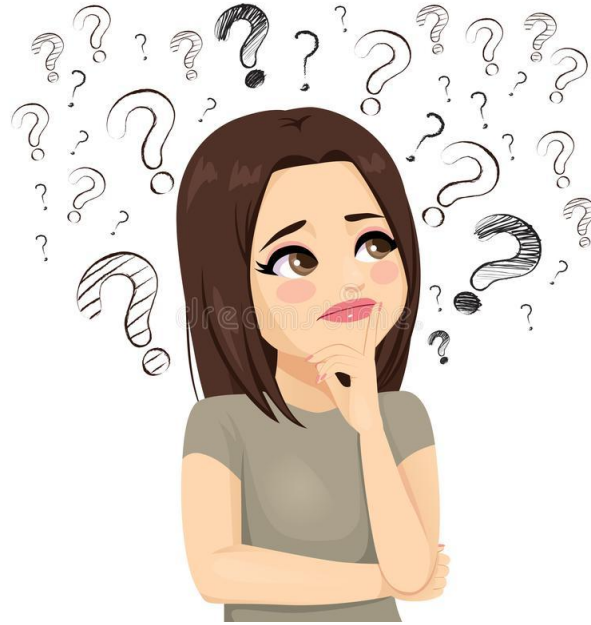
Key Points

- Matter is anything is anything that has mass and takes up space.
- The three states of matter are:
 - solids, liquids and gases.
- Solids:
 - have a definite shape, mass and volume.
- Liquids:
 - have a definite mass and volume, but not shape.
- Gases:
 - do not have a definite mass, volume, or shape.
- There are five state changes:
 - Melting, Freezing, Evaropation, Condenstation, Sublimation



Cells

What is a Cell?



The Cell

The cell is the basic unit of life. All living things have cells. Some organisms are multicellular (many cells) like humans while others are so tiny they only have one cell; unicellular such as some bacteria.

Plant Cell and Animal Cell

All plants and animal cells contain structures called organelles which are specialized to carry out one or more vital function, just like organs carry out specific functions in the human body.

The following organelles are in all plant and animal cells:

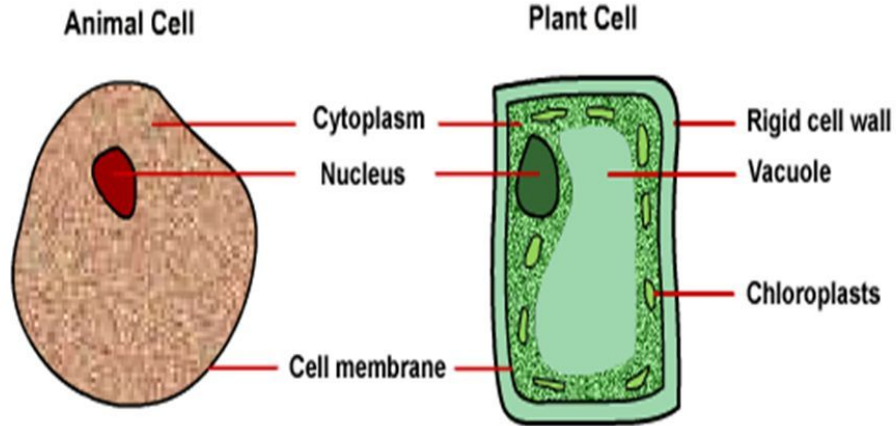
- Cell Membrane
- Cytoplasm
- Nucleus
- Mitochondria
- Ribosomes
- Vacuole (small in animal cell, large in plant cell)

The following organelles are ONLY found in plant cells:

- Cell Wall
- Chloroplasts

Spot the three differences

***SO CAN YOU SPOT THE DIFFERENCES
BETWEEN ANIMAL AND PLANT CELLS?***



What did we learn today?

- The importance of studying science
- States of Matter
- Changing States
- Definition of a cell
- Differences between Plant and Animal Cell

Draw and annotate the Plant and Animal Cell in your notebook

Page 9 in the Integrated Science Concise. Upload picture of your drawing to Google classroom. Due Tuesday 15th September 2020.