12.1 Introduction to Matter

Physical Science

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction

Summarize your understanding of each paragraph.

Matter is the substance of which all material is made - that means objects which have mass. Ordinary matter is made of tiny particles called atoms.

Matter is the **Stuff Around You**. Matter is everything around you. Atoms and molecules are all composed of matter. Matter is anything that has mass and takes up space.

A common definition for matter is “matter is any substance which has mass and occupies space.” All physical objects are composed of matter. Physical objects are made up of atoms. Atoms are made up of protons, neutrons, and electrons.

Matter consists of particles, each with mass and size. The most familiar examples of material particles are the electron, the proton and the neutron. Matter can exist in several states, also called phases. Solid, liquid and gas are “states” or “phases” of matter.

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Title of Passage.

1

In order to recognize what “matter”, you also need to recognize what “mass” is. Matter occupies space AND matter has mass. 2

- Mass is a property of a physical body.
- Mass is a measure of an object's resistance to acceleration.
- Acceleration is a change in an object’s state of motion when a force is applied.

Mass is NOT the same as weight, even though mass is often determined by measuring the object's weight using a spring scale.

Weight is a force, while mass is the property that (along with gravity) determines the strength of this force.

Adapted from https://en.wikipedia.org/wiki/Mass

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

More about Mass and Weight

Though the terms weight and mass are used interchangeably in common language, in science there is distinct difference between the two terms.

The weight of an object = force of gravity felt by that object but the mass of an object is the amount of matter the object has.

Mass is a measure of the object's resistance to acceleration: a push on a skateboard will make it roll away quickly but the same push on a more massive car will barely budge it.

An object's weight depends on the pull of the gravitating object but the object's mass is independent of the gravity. For example, Joe Average weighs himself on the Earth's surface and then on the Moon's surface. His weight on the Moon will be about six times less than on the Earth but the number of atoms in his body has not changed so his mass is the same at the two places.

A kilogram is a quantity of mass and a newton is a quantity of force.

One kilogram (kg) = 2.205 pounds of mass and 4.45 newtons (N) = 1 pound of force. If someone uses ``pounds'', be sure you understand if s/he means force or mass!

http://www.astronomynotes.com/gravappl/s4.htm

Copy the Chart

Copy the Comparison Chart in the Space Provided

Comparison chart

	Mass	Weight
Definition	Mass is the quantity of matter in a body regardless of its volume or of any forces acting on it.	Weight is a measurement of the gravitational force acting on an object.
Effect of gravity	Mass is always constant at any place and any time	The weight of an object depends on the gravity at that place
Unit of Measurement	Mass is expressed in kilogram (kg), grams (g), and milligram (mg).	Weight is expressed in Newton (N)

http://www.diffen.com

Draw (Copy) the Illustration Here

Interpret a Graph

Write the title of the graph _____

Circle the type of chart this represents

Bar Chart *Line Chart* *Pie Chart* *Other*

If applicable,

What does the X-axis represent _____

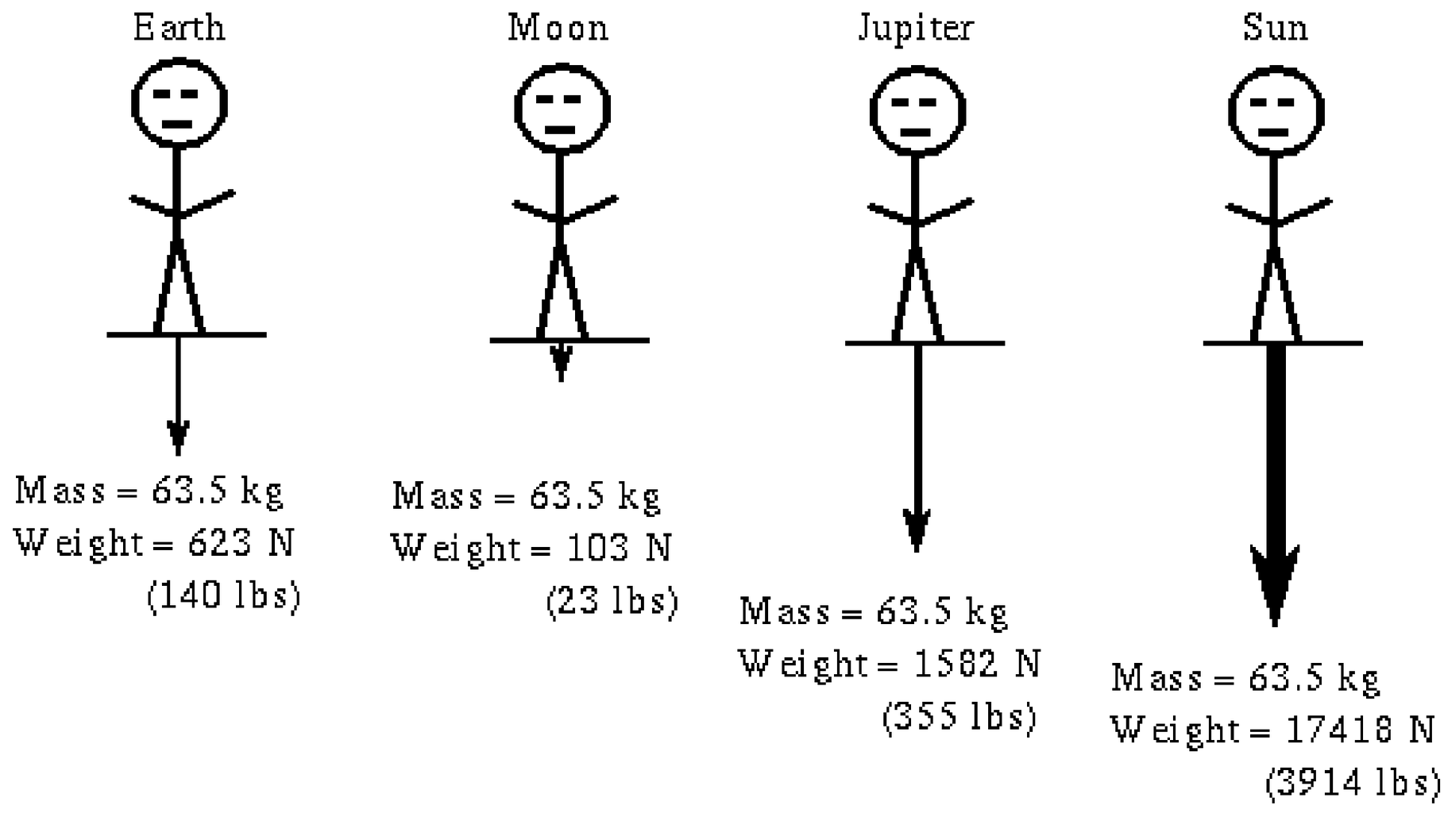
What does the Y-axis imply _____

Summarize what this graph represents or conveys

_____

http://www.astronomynotes.com

Comparison of Mass and Weight of a Person
On Earth, the Moon, Jupiter, and the Sun



Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

1.
2.
3.
4.
5.
6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.