## Questions

#### Activity 1: What Am I? Question Group 1 Question 1

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

Generally, I am as dense as they come. (FYI: this is not a statement a person would proudly make of themselves.)

### Question 2

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

I am the least dense of all states of matter.

### **Question 3**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

When all our volumes are equal, my mass is the greatest of all.

### **Question 4**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

When all our volumes are equal, my mass is the least of all.

# Question Group 2 Question 5

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

I am easily **compressible** and sensitive to changes in temperature and pressure.

#### **Question 6**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

I am the most **incompressible** of all. You can turn up the heat or give me in a tight squeeze, but good luck changing my volume.

### **Question 7**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

I have a constant or relatively constant density despite changes in external pressure.

#### Question Group 3 Question 8

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

I have a fixed shape and volume.

### **Question 9**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

My volume is fixed but my shape is determined by the container that I am in.

### **Question 10**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

Both my volume and my shape are determined by the container that I am in.

Question Group 4 Question 11 Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

Open the door of my container and I'll flow from here to there.

## Question 12

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

You can open the door but I'm not going anywhere. Flow is not my business.

## **Question 13**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

Changing locations is not a problem with me. I can flow when needed.

## **Question 14**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

The chickens can fly the coup but I'm staying right here. I do not flow.

# Question Group 5 Question 15

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

My particles are in constant motion. There's nothing to very little to hold them in place.

### **Question 16**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

I keep my particles in order. They're locked in place and not going anywhere.

**Question 17** 

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

There is little to nothing that can force my particles into staying put. When they want to flow to another location, they do.

#### **Question 18**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select all that apply.

Even if my particles wanted to move, they couldn't. The forces that hold them in place are too strong to allow them to move.

#### Question Group 6 Question 19

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

My particles mingle and move about. But they pretty much stay together in the same general area of the container that we're housed in.

#### **Question 20**

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

Nothing keeps my particles down. They move. They mingle. And they explore the entire container that we're housed in.

### Question 21

Consider the statement regarding a sample of matter, written in the *first person*. Does the statement describe a solid, liquid, or a gas? Select one.

My particles may wiggle a bit. But for the most part, they cuddle together. Each stays in its own place and would never explore the rest of the container that we are housed in.

## **Activity 2: Matching Pairs**

This activity presents learners with 8 different terms that must be matched by meaning. Learners tap on the terms to select them and then tap on the Check Match button. The order of the terms is randomized. A mis-matched pair restarts the *game* and re-randomizes the order of the terms. The terms are ...

# Question Group 7

Question 22 Density A ratio of the amount of stuff to the amount of space Viscosity Describes the amount of resistance to flow Compressibility Describes the tendency to decrease volume when put under pressure Buoyancy Tendency to be forced or lifted upward

## Question Group 8 Question 23

Pressure A ratio of force to area over which force is applied Density A ratio of mass to volume Buoyant Force Due to fluid pressing with more force from below than above Compressibility A change in volume due to a change in pressure

### Activity 3: Two Truths and a Lie Question Group 9 Question 24

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Both liquids and gases can exert buoyant forces upon objects that are immersed in them.

In general, solids are more dense than liquids which are more dense than gases. An incompressible substance will readily change its volume when pressure is applied.

## **Question 25**

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

When an object is immersed in a liquid, there will be a buoyant force exerted upon it. A large volume of water will have a smaller density than a small volume of water. Gases are more compressible than liquids which are more compressible than solids.

# **Question 26**

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Buoyant forces are always exerted downwards upon objects that are more dense than the fluid it is immersed in.

A large volume of water will have the same density as a small volume of water.

A compressible fluid will change its volume when pressure is applied.

### Question Group 10 Question 27

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

The density of a material like mercury is not affected by the volume of mercury in the sample.

Gases are the most compressible; solids are the most incompressible.

Liquids are fluids. Solids and gases are not fluids.

## **Question 28**

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

A large volume of water will have the same density as a small volume of water. Gases are the most compressible; solids are the least incompressible. Both liquids and gases are fluids.

### **Question 29**

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

In general, solids are more dense than liquids; gases do not have a density. An incompressible substance will NOT change its volume when pressure is applied. A solid is not a fluid; gases and liquids are fluids.

## Question Group 11 Question 30

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Particles of a solid are close together and locked in place by strong intermolecular forces; this makes them highly incompressible.

Particles of a fluid have weak or no attractions for each other and are thus able to slide past each other and flow.

Only gases can exert buoyant forces upon objects that are immersed in them; liquids and solids do not apply buoyant forces.

### Question 31

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Particles of a liquid are already close together; thus, liquids are not easily compressed. Particles of a solid and a liquid are confined to fixed positions and are unable to flow; but gases flow easily.

Buoyant forces are always exerted upward.

#### Question 32

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Materials with weak or no intermolecular forces are generally less compressible. Because particles of a solid are confined to a fixed position, they are unable to flow. Buoyant forces are of stronger magnitude for objects immersed in liquids compared to gases.

#### Question Group 12 Question 33

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Non-fluids have a fixed shape; they are unaffected by the shape of their container. Particles of a gas are spread further apart and have weak intermolecular forces; this makes them highly compressible.

Only liquids can exert buoyant forces upon objects that are immersed in them; solids and gases do not apply buoyant forces.

### **Question 34**

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

Both liquids and gases are fluids.

An incompressible substance will readily change its volume when pressure is applied. The density of a material like mercury is not affected by the volume of mercury in the sample.

# **Question 35**

Of the three statements, two are TRUE and one is FALSE. Tap to select the FALSE statement.

A liquid is a fluid. A solid is not a fluid. Gases are neither fluids nor non-fluids. Particles of a liquid are already close together; thus, liquids are not easily compressed. Both liquids and gases can exert buoyant forces upon objects that are immersed in them.