

# Gas pressure Worksheet



# Exam question



# Exam questions

1.
  - a. Describe the motions of particles in a gas. **(1 mark)**
  - b. Explain why heating a gas increases the pressure. **(4 marks)**



# Answers



# Exam question - review

1)

a) **Random (motion)**

b) **Heating increases the temperature of the gas. (1)**

**The temperature is proportional to the (average) kinetic energy of the particles. (1)**

**An increase in kinetic energy means the particles will move faster. (1)**

**This causes more frequent collisions so the pressure of the gas increases. (1)**



# Exam question - review

2)

Ice heating:

$$E = m \times 2100 \times 3 = m \times 6300 \text{ (1)}$$

Ice melting:

$$E = m \times 340000 \text{ (1)}$$

Water heating:

$$E = m \times 4200 \times 5 = m \times 21000 \text{ (1)}$$

Total thermal energy transfer:

$$7500 = m \times 6300 + m \times 340000 + m \times 21000 = m \times 361300 \text{ (1)}$$

$$m = 7500 / 361300 \text{ (1)}$$

$$m = \mathbf{0.02 \text{ kg (1)}}$$



# In lesson questions



## Warm up

1. Label each state of matter
2. Describe the particle movement for each state of matter.
3. **Challenge** - state and explain which state has the most internal energy.



# **Pause the video to complete your task**

## **Gas pressure**

- 1) State two things particles collide with.**
- 2) What does the kinetic energy of the particles depend upon?**
- 3) What two words could be used to describe the motion of gas particles?**
- 4) Challenge - explain how gas particles cause pressure inside the balloon.**

**Resume once you're finished**



# **Pause the video to complete your task**

## **Gas pressure**

- 1) What is the relationship between temperature and pressure at constant volume?**
- 2) If the volume of a container is fixed and the temperature of the gas is lowered, what would we expect to happen to the pressure?**
- 3) What does absolute zero mean?**

**Resume once you're finished**



# Independent practice

1. Why can heating a sealed container cause it to explode? Use the words **kinetic energy, collisions, frequent, forceful, pressure.**
2. State and explain what would happen to the pressure of a gas in a fixed container if the temperature was decreased.



# Answers



# Review

## Warm up

1. Label each state of matter. **Left to right - solid, liquid and gas.**
2. Describe the particle movement for each state of matter.  
**Solids - the particles vibrate around a fixed position.**  
**Liquids - the particles are free to move past one another.**  
**Gas - the particles are in constant and random motion.**
3. **Challenge** - state and explain which state has the most internal energy. **The gas state. The particles in a gas move faster than in the other states, this means the kinetic store of the particles is greater. Furthermore, to become a gas particles must overcome the intermolecular forces of attraction. When this happens, the potential energy store of the particles increases.**



# Review

1. State two things particles collide with. **Walls of container, other particles**
2. What does the kinetic energy of the particles depend upon?  
**Temperature**
3. What two words could be used to describe the motion of gas particles?  
**Constant and random**
4. **Challenge** - explain how gas particles cause pressure inside the balloon.
  - **The pressure of a gas results from collisions between the gas particles and the walls of the container**
  - **Each time a gas particle hits the wall, it exerts a force on the wall.**
  - **The total force per unit area is the pressure.**



# Review

1. What is the relationship between temperature and pressure at constant volume? **Directly proportional, increasing temperature increases pressure.**
2. If the volume of a container is fixed and the temperature of the gas is lowered, what would we expect to happen to the pressure? **It would decrease.**
3. What does absolute zero mean? **The point at which particles have zero energy in their kinetic store and all particle motion has stopped completely.**



# Review

1. Why can heating a sealed container cause it to explode? Use the words **kinetic energy, collisions, frequent, forceful, pressure.**  
**The particles have higher kinetic energy store, so have more frequent and forceful collisions. This generates a higher pressure, which may be beyond what the walls of the container can hold and it explodes.**
2. State and explain what would happen to the pressure of a gas in a fixed container if the temperature was decreased. **The pressure would decrease.**  
**This is because the particles have a lower kinetic energy store so will collide with walls less frequently with less force.**

