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Natural Sciences Grade 8
Marks: 30 converted to 20

Practical Task / Investigation
Memorandum

CHANGE OF STATE

Aim:

To investigate the change of state when a substance is heated or cooled down.

Investigative question:

(NOTE: The answer to a proper investigative question is NOT yes or no.)

Consider the following two possible questions for this investigation:

A: Does the state of a substance change when it is heated or cooled?

B: What is the effect of heating and cooling on the state of a substance?

Choose the most appropriate investigative question. Only write down **A** or **B** and give a reason for your answer.

B; ✓ a scientific investigation must be done to find the answer for question B and the answer to the question is not just yes or no. ✓ (2)

Variables:

Identify the **independent variable**: *Heating or cooling of the substance.* ✓ (1)

Identify the **dependent variable**: *The state of the substance OR the phase change.* ✓ (1)

Method:

You can do the two investigations one after the other or simultaneously, depending on the availability of apparatus. Alternatively, half of the groups in the class can do the heating of candle wax and the other groups can do the heating of ice.

Heating of candle wax:

1. Place a few small pieces of candle wax in a heat resistant dish like an empty tin, a foil dish or a porcelain dish.
2. Place a wire gauze on a tripod stand with the dish on top of the gauze.
3. Place a bunsen burner or spirit lamp underneath the tripod stand.
4. Light the bunsen burner/spirit lamp and gently heat the candle wax.
5. Observe the change in state as the candle wax heats up. **Do not overheat the candle wax.**
6. Turn off the bunsen burner/spirit lamp and allow the wax to cool down again.
7. Record the change of state/observations in the table of results.

Heating of ice:

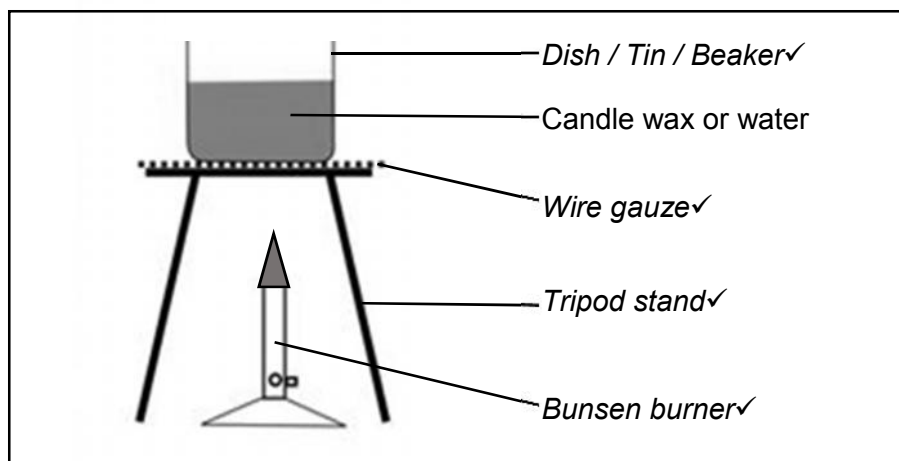
8. Place a few ice cubes in a dish.
9. Repeat steps 2, 3 and 4.
10. Observe the change in state of the ice. Keep on heating the water until it boils.
11. Turn off the bunsen burner/spirit lamp and allow the water to cool down again.
12. Record the change of state/observations in the table of results.



Apparatus:

Identify and label the missing parts in the diagram.

(4)

**Results:**

(5)

	Observations during heating	Observations during cooling
Candle wax	<i>The (solid) candle wax melts and turns into a liquid. ✓</i>	<i>The liquid candle wax turns into a solid again OR the liquid candle wax solidifies when it cools down. ✓</i>
Ice	<i>The ice melts and turns into a liquid (water). ✓ The water evaporates and turns into a gas (water vapour). ✓</i>	<i>The steam (water vapour) turns into a liquid (water) again. ✓ (Can be seen on the cooler parts of the container.)</i>

Safety measures:

Why is it dangerous to overheat the candle wax?

*When candle wax gets very hot it releases fumes that are flammable. ✓***OR***When candle wax gets very hot the vapours produced can ignite. ✓*

(1)

What is the function of the wire gauze?

*To spread/conduct the heat evenly ✓***OR** *to prevent direct contact of the glass with the flame. ✓*

(1)

Conclusion:
Word bank: energy, solid, gas, liquid, removed, added

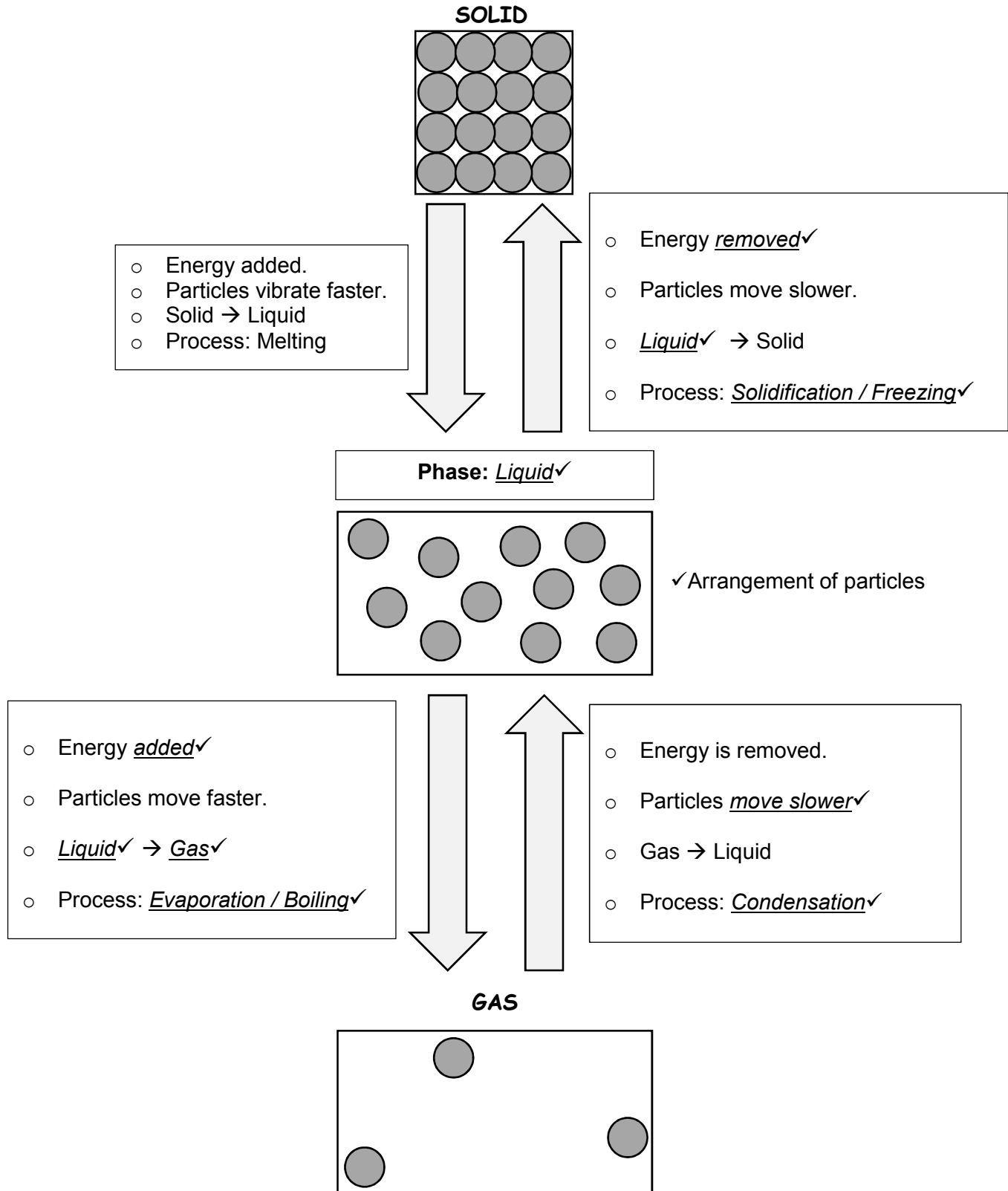
Complete the conclusion. Use words from the word bank:

If energy is added to a solid, the solid turns into a liquid. ✓When energy ✓ is added to a liquid, the liquid changes into a gas.When energy is removed from a gas, ✓ it changes to a liquid. For the liquid tochange into a solid, more energy ✓ must be removed.

(4)

Diagrammatic representation of what happens during phase changes:

Fill in the missing word to complete the diagram.



(11)

TOTAL: 30