



HEATING GETS THEM MOVING



DART ACTIVITY

Verse 1:

Why is lead so 1. _____, and why does ice melt when its warm?
Why do liquids flow and take on their container's form?
The reason substances behave in the way they do,
They're made from 2. _____ that bond and move

Chorus:

3. _____, ions, molecules, make up all substances and,
Heating them makes these particles break 4. _____ and move at greater speed,
The way they bond or move gives substances their properties,
Solid, liquid, gas, that's the particle theory.
Heating gets them moving.

Verse 2:

Particles in solids are as close as they can be,
That's why 5. _____ them cannot be done so easily,
It's also why they tend to have the greatest density,
More 6. _____ of mass per metre cubed.
Stuck together tightly, their particles 7. _____,
Those bonds are why a solid keeps its shape.

Verse 3:

When you're heating up a substance, you raise its 8. _____,
By doing 9. _____ on particles to make them vibrate more,
They push themselves apart a little further than before,
But the bonds will hold the particles in place.
Strong bonds make it harder to vibrate them rapidly,
So a substance with strong bonds has higher 10. _____.

Chorus

Verse 4:

Eventually the temperature will no longer 11. _____,
Particles won't vibrate any faster 'til some bonds release,
The energy that breaks the bonds is known as 12. _____,
Then the solid can begin to 13. _____.
Particles in liquids stay close but bonds can split,
So a liquid 14. _____ but might only compress a tiny bit.

Chorus

Verse 5:

Keep providing energy and all the bonds will break,
15. _____ liquids bubble as their particles separate to gas,
Whizzing around at 16. _____ speeds in random ways,
17. _____ gases particles have higher average rates,
Spreading out as much as possible to fill up any space,
18. _____ with the sides of vessels they accommodate,
More collisions every second, the 19. _____ escalates,
And rises with the temperature as the particles 20. _____.

Chorus

Complete the following tasks

1. Fill in the blank keywords - if you are not sure, there are clues on the next page.
2. Circle sections in **red** that describe the **properties of substances**.
3. Circle sections in **green** that **describe how** particles behave.
4. Circle sections in **blue** that **explain how** particles behave.

Each of these words is used once.

dense boiling temperature random latent heat
vibrate increase pressure particles accelerate
atoms work kilograms hotter colliding
compressing flows heat capacity melt bonds

Definitions

1. A quantity describing how much mass a certain volume of a substance has.
2. Small lumps of matter.
3. A small particle made of protons, neutrons and electrons.
4. The forces between particles that mean they stick together.
5. Squeezing particles closer together.
6. The unit of measurement of mass.
7. Moving backwards and forwards around a central point.
8. A measurement of the hotness of something, measured with a thermometer.
9. A way to transfer energy by pulling or pushing.
10. A measure specific to a substance of how much energy is needed to raise the temperature of 1 kilogram of the substance by 1 degree centigrade.
11. To get higher in value.
12. The energy transferred to or from the surroundings when a substance changes state.
13. To change state from a solid to a liquid.
14. When a substance particles move around freely.
15. To change state from a liquid to a gas.
16. Unpredictably, without a pattern.
17. A higher temperature.
18. Bumping into.
19. When a force is spread over an area, or force per metre squared.
20. To change speed.

