

Science – Y6 Sp 1 – Heat

Subject Knowledge Notes:

- Largely this is a lesson that recaps content from earlier years that students must know to understand the content later in the unit
- Particle model helps us understand the properties of solids, liquids and gases and the changes of phase that occur between each of these three phases
- By knowing the changes of state, students should be able to identify

For this lesson you will need:

- Make space for students to act out how particles behave in solids, liquids and gases and how they will behave in the changes between these phases (it may be best to practice modelling the particle behaviours with a few students beforehand to use as an accurate demonstration of the model before the whole class attempts it)
- Ideally show an ice cube melting, chocolate melting or any other physical examples of changes of state that you can demonstrate to return to concrete examples of what they theory is describing.

Lesson One: What happens when you heat particles?

 <p>10 minutes</p>	<ul style="list-style-type: none"> • Ask children to try their best to recall the information previously learnt. • If they struggle to do this, ask them to move onto the next question. • After 5 mins, pick children to share their answers aloud, ask children to use a different coloured pen to tick or fix their answers.
 <p>15 minutes</p>	<ul style="list-style-type: none"> • Use a small group of students to model how particles behave in solids, liquids and gases • Note down how the particles behave in each phase of matter as a class in the spaces provided in the booklet • Class to form into groups to act out how particles behave in solids, liquids and gases • Pause group and pick one group to demonstrate to the others to point out key aspects of the model that some may not quite be getting right (i.e. as a solid, some groups may not link arms to show that they are bonded together. Show a group that is doing this to the rest of the class to improve everyone's modelling)
 <p>10 minutes</p>	<ul style="list-style-type: none"> • Inform children that the following questions we will answer will be based on this text about phase changes. • Begin reading aloud and ask children to follow under each word with their finger. • Switch readers every so often. • Emphasise any words in bold as key words/phrases.
 <p>10 minutes</p>	<ul style="list-style-type: none"> • Ask children to answer the following questions using the text just read about phase changes to find the answer. • Inform children that some of the words are in bold; this gives us a clue about where the key information is, which will help us to find the answers. • Model doing this for the first question • Highlight the answer in the text and talk aloud about the clues that helped you to find the answer e.g. <i>"I have to fill in the gap, so I'm looking for a word in the text that begins with an a"</i> • Continue reading the text and stop children to answer the questions. • Cold call children to share their answers aloud, ask children to use a different coloured pen to tick or fix their answer.
 <p>15 minutes</p>	<ul style="list-style-type: none"> • Explain to the class that we can use our understanding of phase changes to identify which phase changes are present in the world around us • Go through the first task together, discussing which phase change is present when water appears on a mirror when you breathe on it and how we can tell this in the 'why' column • For the rest of this task, the level of support provided depends on the students in the class. You can either leave the class to discuss and attempt the rest of the examples independently or you can discuss each class and fill in the answers all together as you go along to ensure everyone completes it at the same speed.

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	<ul style="list-style-type: none">• If the class are attempting it independently, go through the answers on the board once they have attempted all the tasks and get students to mark/correct their work with a different pen of a different colour
 10 minutes	<ul style="list-style-type: none">• This is similar to the task above except that students should act out the phase changes between each state of matter rather than individual state.• Depending on the confidence of the class, it may be best to recap solid, liquids and gases first before showing the changes of state• Select one group to demonstrate what happens when something melts (bonds break and particles can slide over each other but they are still very close together), freezes (bonds are formed and particles can only vibrate in fixed positions), boils/vaporizes (all bonds are broken, particles move in different directions, bounce off each other and any surfaces they come into contact with and are generally far apart) and condense (come close together and form some bonds, but still moving and can slide over each other)• Then call out different phase changes (or even combinations of phase changes) to get students to model each process confidently
 10 minutes	<ul style="list-style-type: none">• Students should write a description of what happens to particles in ice when it melts to form water in as much detail as possible and in full sentences.• If needed, scaffold this task with the key bullet points that need to be included in their answer by putting them on the board. They should include a minimum of 3 points to describe the changes that are taking place.
 5 minutes	<ul style="list-style-type: none">• Ask children to look at the diagrams of dry ice (frozen carbon dioxide) on the board• Explain that 'dry ice' does not become a liquid at all – in fact, it becomes a gas straight away• Students should discuss with a partner what this means about the bonds (essentially that it only has weak bonds when it is a solid, so when it melts, all bonds are broken and the particles become free as part of a gas straight away)
 5 minutes	<ul style="list-style-type: none">• Return to page 3 and explain happens when you heat particles in a couple of sentences.