

## PROPERTIES OF MATTER (teacher's notes)

### DENSITY

#### About density:

- Solid, liquids and gases share this property of matter.
- Density is the amount of matter contained in a specific volume/space.
- Mass is the amount of matter in an object and weight is the force exerted on it by gravity, the mass remains constant and the weight changes when gravity changes.
- Water density is 1gram per cubic centimetre, so materials will float in water if they are less dense than water.
- “When most pure liquids freeze, they form solids that are denser than liquid; so the solid forms at the bottom of the container” from *Why does a ball bounce? And 100 other questions from the world of science* by Adam Hart-Davis, published by Ebury Press, London 2006.

An example is when oil freezes in winter if it's in a cold place.

- “Water is almost unique, because ice is about one tenth less dense than water, which means that ice cubes float in drinks and icebergs float in the sea, with about one tenth... showing above the surface... Water has another curious property; it has a maximum density at 4° C. A litre of water at 4° C weighs more than a litre of water at 3° C or 5° C, and noticeable more than a litre of ice at 0° C or below.” From *Why does a ball bounce? And 100 other questions from the world of science* by Adam Hart-Davis, published by Ebury Press, London 2006.

#### Activity 2: Let's test the effect of heat on density.

C) The hot water rises from the holes and floats in the cold water, and the coloured cold water doesn't move. After a while, the hot water is mixed with the cold water in the big container.

D) This happens because hot water is less dense, it's lighter, than cold water. For this reason hot water molecules float in cool water molecules.