

Motor oil \rightarrow 2.08 s travelled 10 cm

$$\text{Flow Rate} = \frac{10 \text{ cm}}{2.08 \text{ s}} = 4.80 \text{ cm/s}$$

$$\text{Flow Rate} = \frac{\text{Distance (cm)}}{\text{Time (s)}}$$

Molasses 21.21 s for 10 cm

$$\text{Flow Rate (mol)} = \frac{10 \text{ cm}}{21.21 \text{ s}} = 0.471 \text{ cm/s}$$

Veg 2.21 s for 10 cm

$$\text{Flow Rate} = \frac{10 \text{ cm}}{2.21 \text{ s}} = 4.524 \text{ cm/s}$$

honey 1 min 20 sec for 10 cm
80 seconds

$$\text{Flow Rate} = \frac{10 \text{ cm}}{80 \text{ s}} = 0.125 \text{ cm/s}$$

Detergent

3.83 s for 10 cm

$$\text{Flow Rate} = \frac{10 \text{ cm}}{3.83 \text{ s}} = 2.61 \text{ cm/s}$$

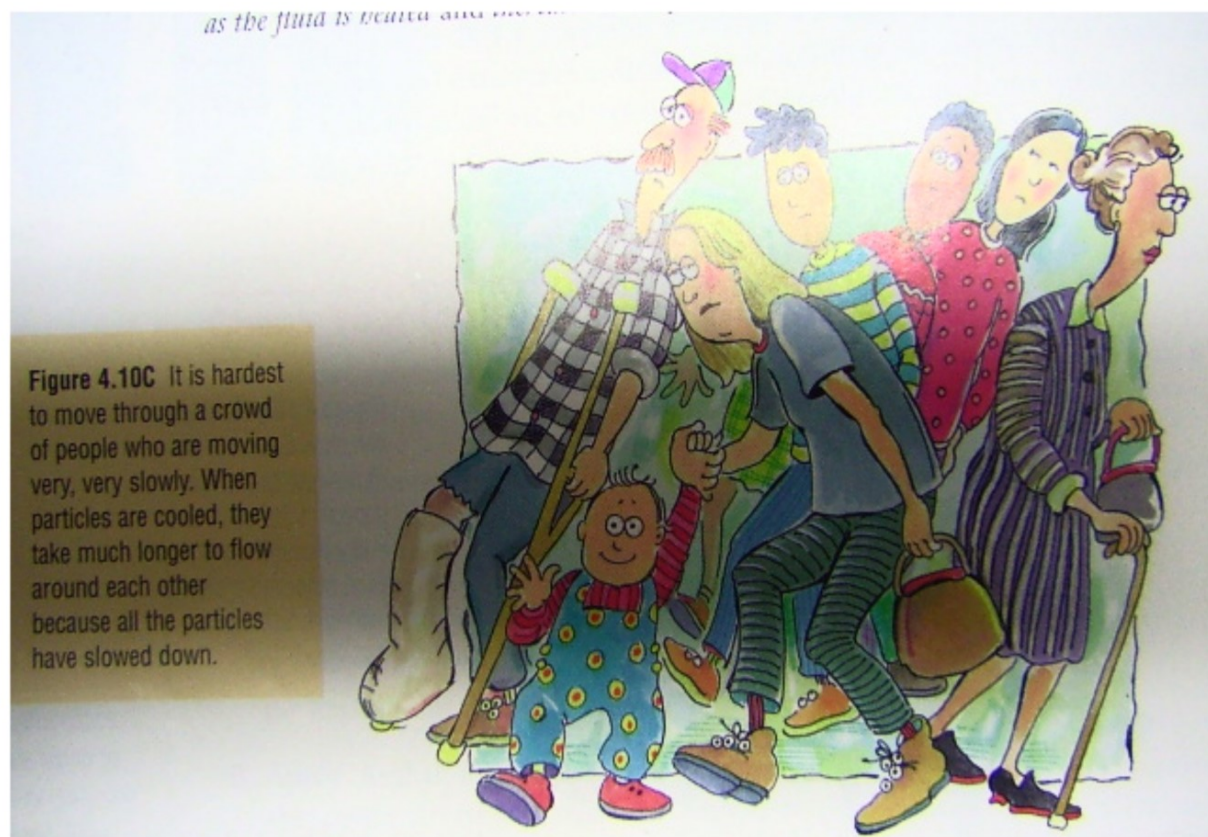
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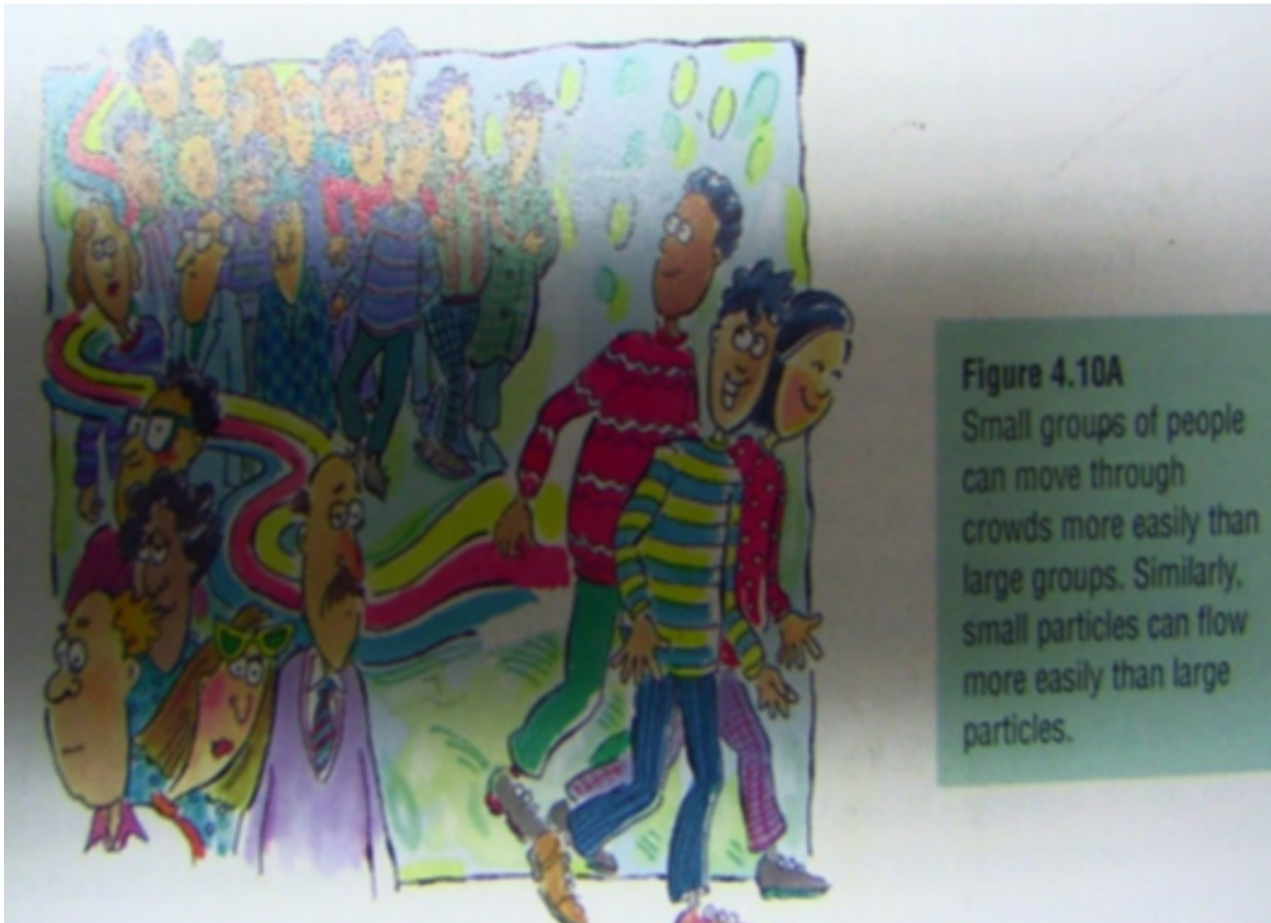
The higher the viscosity of a substance, the lower its flow rate.
In other words:

High Viscosity = low flow rate → Slow → thicker
Low Viscosity = high flow rate → Fast → thinner

Ex) Water & Alcohol have low viscosity but a high flow rate.

Molasses & honey have a high viscosity and low flow rate.





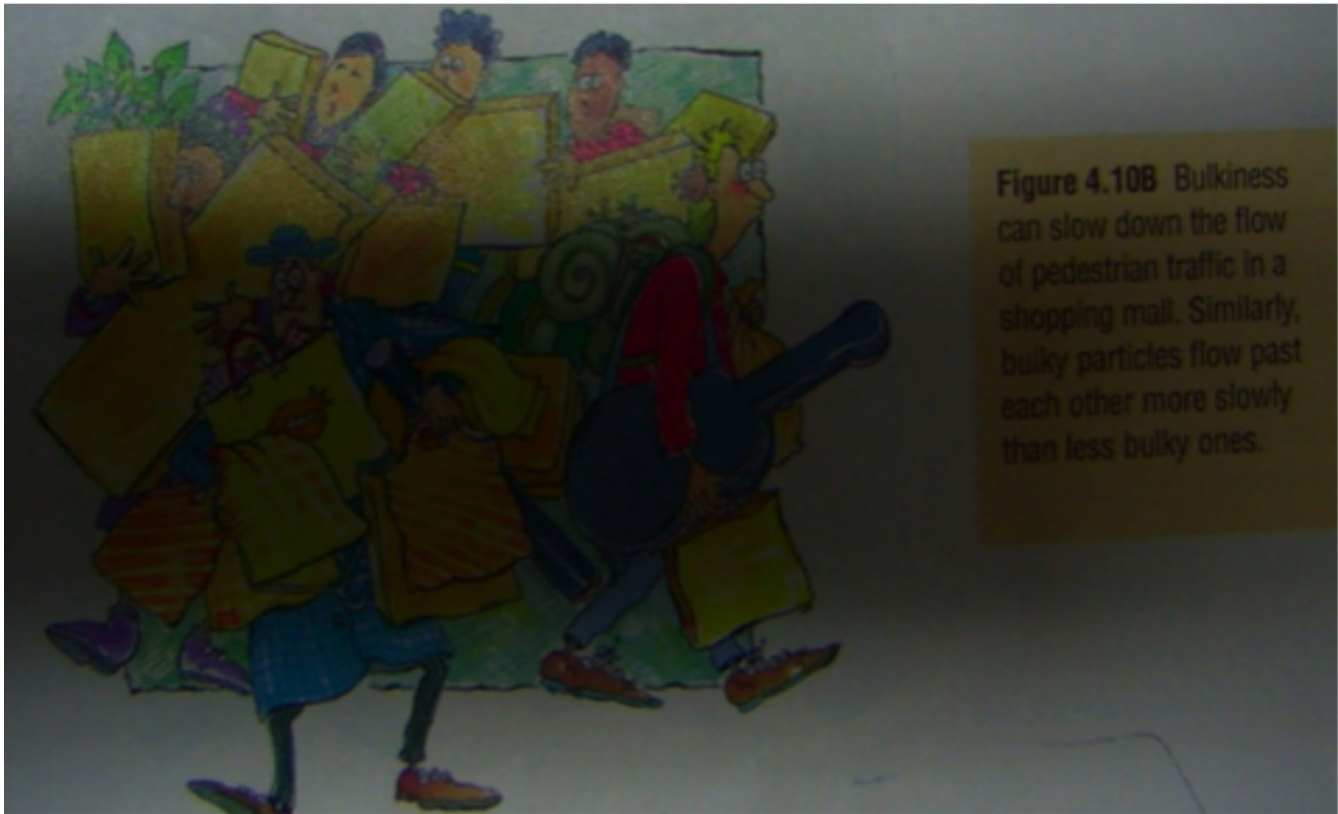


Figure 4.10B Bulkiness can slow down the flow of pedestrian traffic in a shopping mall. Similarly, bulky particles flow past each other more slowly than less bulky ones.

FACTORS THAT AFFECT VISCOSITY

1) Temperature

As you increase temperature, you decrease a fluid's viscosity. As you decrease temperature, you increase a fluid's viscosity. (It is opposite for gasses)

Ex) Trying to get through the mall when everyone is moving slow (Cold) parcels or moving fast (Hot).

2) Concentration

-The amount of a substance dissolved in a specific volume.

-Increasing the concentration (Bulkiness), increases the viscosity.

Ex) Trying to get through the mall when everyone is carrying parcels.

3) Attractive Forces

If the attractive forces are strong, it is difficult for the particles to pull away thereby the fluid flows slowly and is more viscous.

ex) Moving through a crowded mall where everyone is wearing velcro sneakers. Your sneakers will stick to someone else's velcro.

4) Particle Size

The smaller the particle size, the faster the fluid flows and is less viscous.

Ex) Moving through a crowded mall either in a small group or a large group

VISCOSITY& *FRICTION*?

- Friction resists movement.
- The greater the friction, the greater the viscosity.
- The particles are holding on tightly to each other.

{ (Hand in)
Read page 125 and answer #1(a,b,c,d,e), #2, #3

{ ^{pg. 127}
Look at the "Chapter at a glance". See how many of the section topics do you know. (Leave out jobs or industries of section 4.2 and industries. We did not cover this)

Viscosity changes with temperature

-The viscosity of a liquid decreases when it is heated and increases when it is cool.

Journal

- 1) Explain the above effect using the particle theory
- 2) Apply: Asphalt is the black, stick material that binds gravel in the pavement that covers streets and highways. Explain why paving is almost always done during the summer months.

Important

Journal Response

Increasing temperature, will increase energy of the particles which causes the particles to move faster. As they move quickly they bump into each other more quickly with they interact for a shorter period of time (shorter interactions) reducing internal friction or stress and therefore decreasing viscosity.

Test

Grade 8 Science

Chapter 4 Viscosity

Matching

Definitions of Matter, Melting, vaporization, condensation, freezing, sublimations, evaporation, boiling, then Boiling and Melting points, Viscosity, Flow rate, fluids.

✓ has
X doesn't
have

	Shape	Volume
S	✓	✓
L	X	✓
G	X	X

vibrate

space

very far apart

Short response or multiple choice

-know chart for solid, liquid and gas

-How does viscosity relate to flow rate? How would friction (rough surface) affect flow rate?

- Know 5 properties particle of matter (List them)

-How does temperature affect the viscosity? (Use particle theory of matter to explain this)

- Know 2 other effects on viscosity (Just list)