THE PIQUE LAB LEARNING CENTRE

Primary School Science Programme



P6 CCI™ SCIENCE COURSE

Answers to FITB Booklet (2026)

Name: _____

Class: _____

TOPICS COVERED

Topic	Title	Page
1	Body Systems	1 – 4
2	Heat Energy	5 – 8
3	Light & Shadows	9 – 11
4	Magnets	12 – 13
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2026 P6 CCI™ SCIENCE COURSE

TOPIC: BODY SYSTEMS

Page 1 of FITB Booklet

5 TYPES OF BODY SYSTEMS	HOW DIFFERENT BODY SYSTEMS WORK TOGETHER
Digestive Respiratory Circulatory Muscular Skeletal	Oxygen — Respiratory Carbon dioxide — Circulatory Digested food — Digestive **How do the circulatory, digestive and respiratory systems work together to provide energy for the body?** simpler ; small intestine ; bloodstream nose ; windpipe ; lungs ; Oxygen ; lungs ; bloodstream heart ; digested food ; oxygen ; respiration ; energy

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DIGESTIVE SYSTEM

Digestion starts **here.**

Teeth ; chew ; smaller

[D] Mouth

Saliva ; digestive juices ; simpler

surface area ; food ; digestive juices (saliva) ; FASTER digestion of food

Least ; Least digestion

Gullet

Churns ; mixes ; digestive juices

muscles ; mouth ; stomach

[D] Stomach

Most ; Most digestion

Digested ; bloodstream

[D] Small intestine [A]

ends

Absorption



Folds ; Villi ; surface area ; small intestine ; digested food ; FASTER absorption of digested food into the bloodstream

Water ; undigested food ; bloodstream

[A] Large intestine

waste materials

Anus

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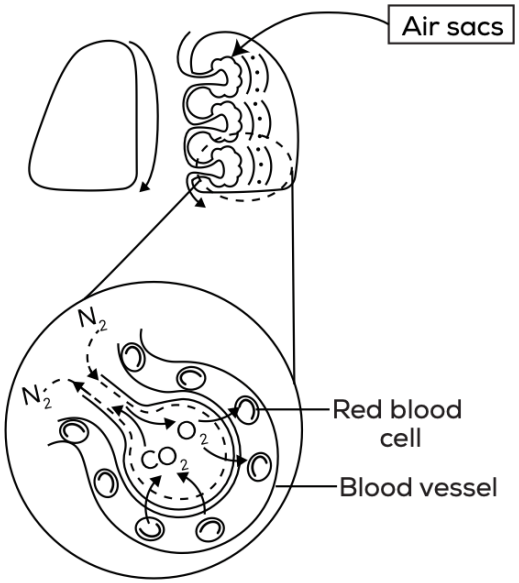
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RESPIRATORY SYSTEM

Nose

Windpipe

Lungs



nose hair ; mucus

dirt ; dust

1. Oxygen
2. Carbon dioxide

exchange of gases

exposed surface area ; lungs ; inhaled air ; FASTER exchange of gases

RICHER IN O_2
POORER IN CO_2

POORER IN O_2
RICHER IN CO_2

	Inhaled air	Exhaled air
Oxygen	21% — -5% →	16%
Carbon dioxide	0.04% — +4.36% →	4.4%
Nitrogen	78%	78%
Water vapour (And other gases)	0.96% — +0.64% →	1.6%
Temperature	Lower	Higher

Always more O_2 than CO_2

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CIRCULATORY SYSTEM

Heart
Blood
Blood vessels

Poorest
Richest

(exchange of gases)

Lungs

Richest
Poorest

Heart

Poor
Rich

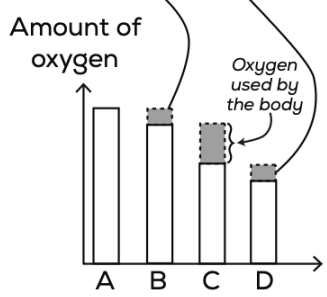
Rich
Poor

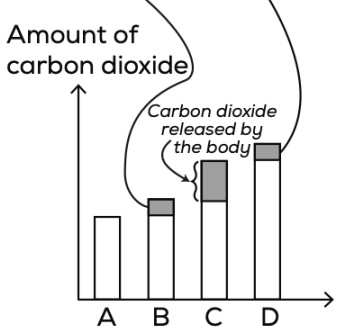
Body

(muscle)

Oxygen is used by the heart during respiration to release energy and carbon dioxide.

(to pump blood)





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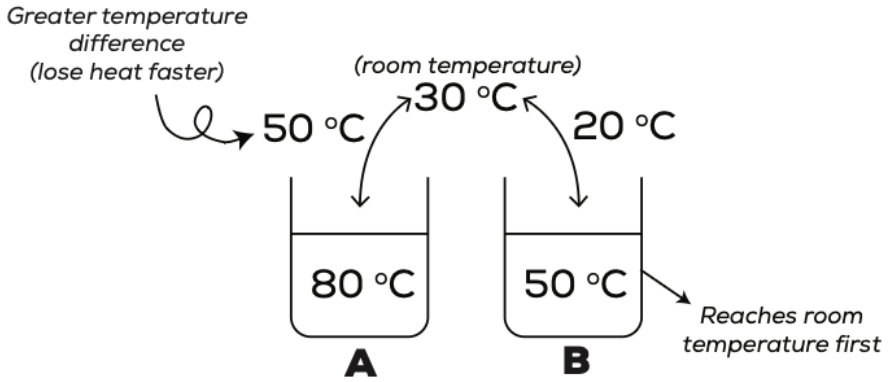
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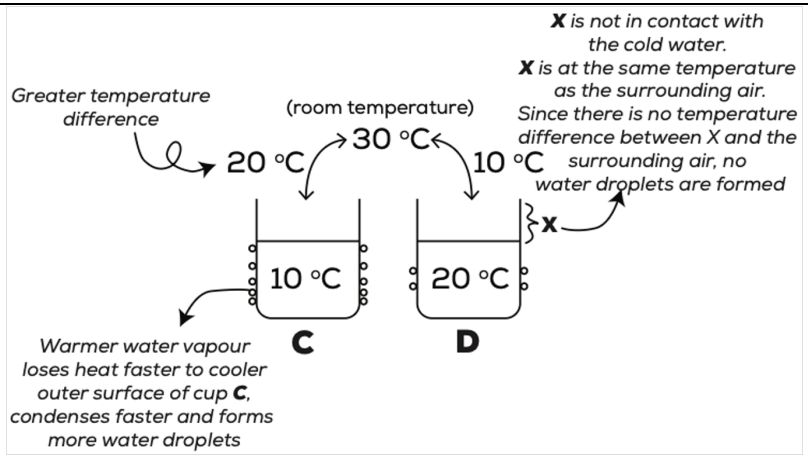
warmer ; cooler

3 FACTORS AFFECTING RATE OF HEAT TRANSFER (TEH / THE)

Temperature difference

- greater ; temperature difference ; faster ; rate of heat transfer
- no heat transfer ; same temperature ; temperature difference



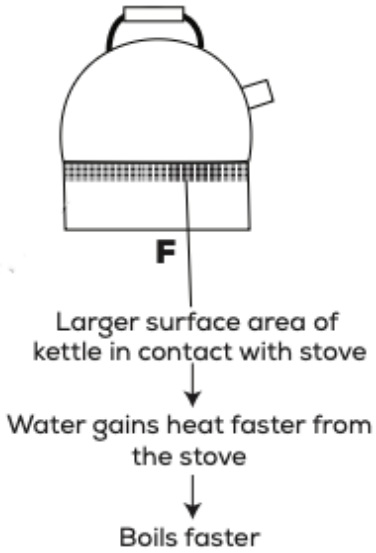
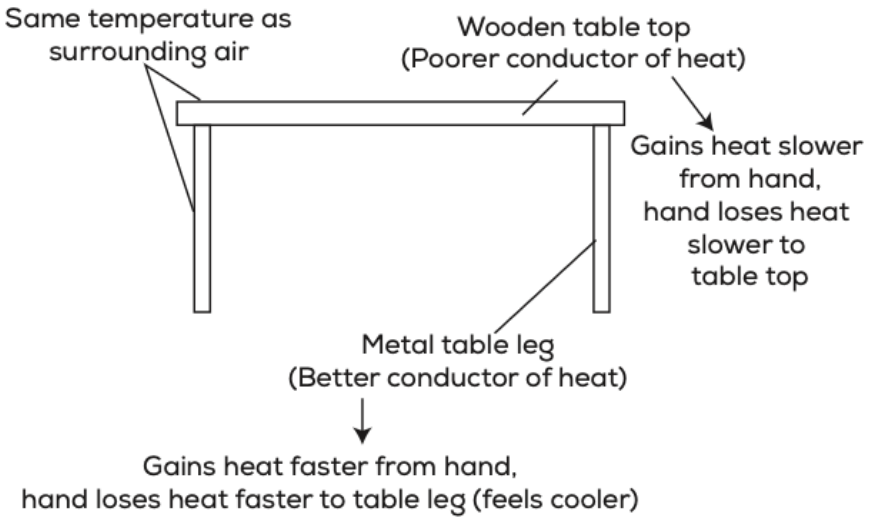


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<table>
<tr><th colspan="2">3 FACTORS AFFECTING THE RATE OF HEAT TRANSFER</th></tr>
<tr><td>(Exposed) surface area

• greater ; (exposed) surface area ; faster ; rate of heat transfer</td><td>Heat conductivity

• Better conductors of heat ; faster
• Poorer conductors of heat ; slower</td></tr>
<tr><td>
</td><td>
</td></tr>
</table>

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7 HEAT PROCESSES

Melting (G)

Evaporation (G)

Boiling (G)

Condensation (L)

Freezing (L)

Expansion (G)

Contraction (L)

Heat gain / loss

gains ; from

loses ; to

Process

Change in state

The water in the t-shirt gains heat from the warmer surrounding air to evaporate and form water vapour.

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HEAT CAN DO 2 THINGS

temperature

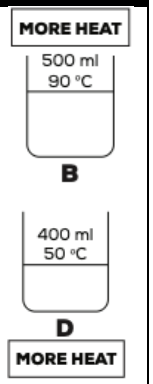
- Increase
- Decrease

state

- Solid → Liquid (Melting)
- Liquid → Solid (Freezing)
- Liquid → Gas (Boiling)

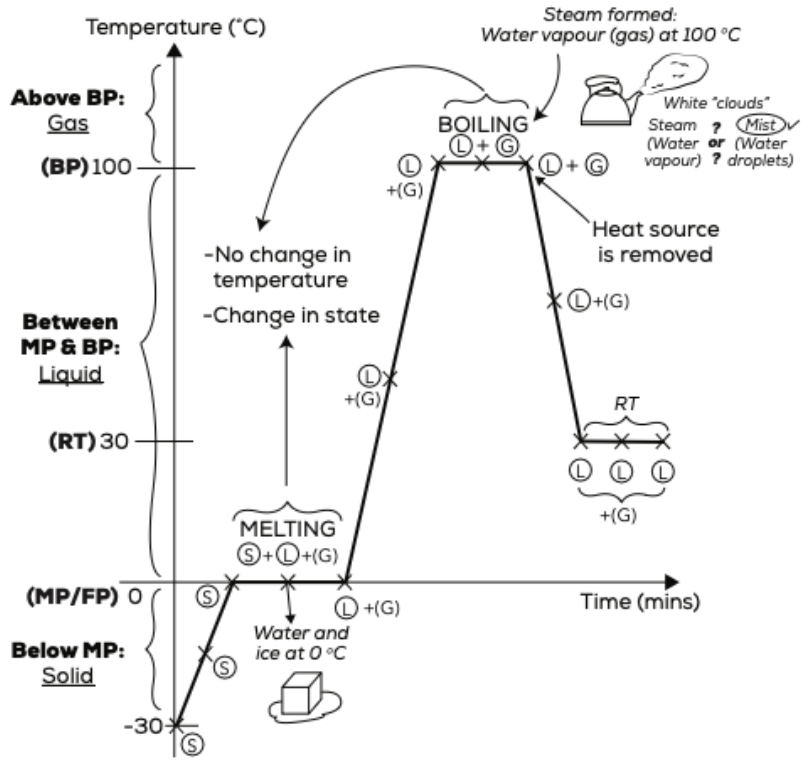
FACTORS AFFECTING THE AMOUNT OF HEAT IN A SUBSTANCE

Temperature



Volume

HEAT GRAPH OF WATER



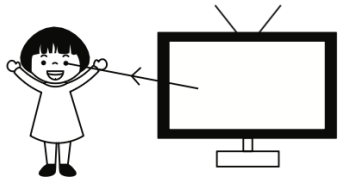
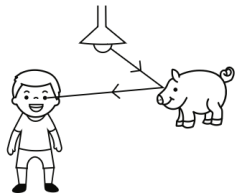
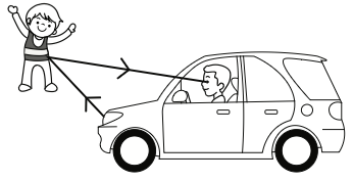
evaporation ; liquids ; MP ; BP ; +(G) ; state ; L to G ; evaporation

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2 PROPERTIES OF LIGHT

- travels in a straight line
- reflected
- blocked

The object is the light source	The object is NOT the light source	
		
television ; travels ; Dora's ; her ; (light source) television (object)	lamp ; reflected ; piggy bank ; John's ; (light source) (object) him ; piggybank (object)	MORE light from the headlights of the car (light source) is reflected off the safety vest into the driver's eyes.

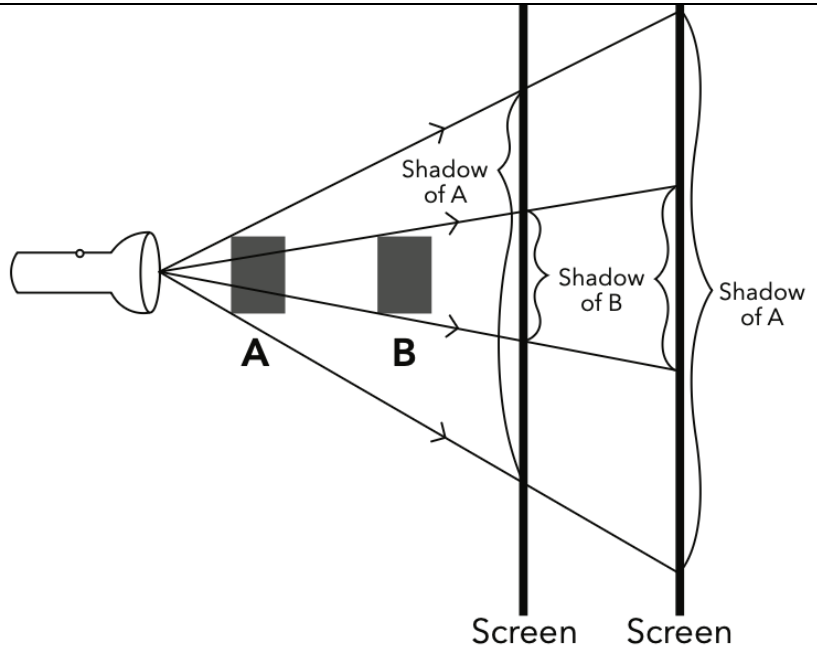
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TRANSPARENCY
Transparent • most • does not cast a shadow • does not allow shadows
Translucent • some • casts a faint shadow • allows faint shadows ; e.g. shadow puppet shows
Opaque • no • casts a dark shadow • allows dark shadows ; e.g. projector screens

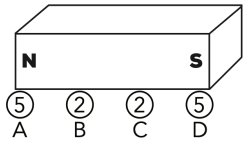
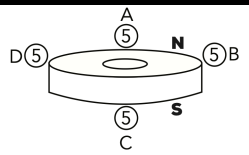
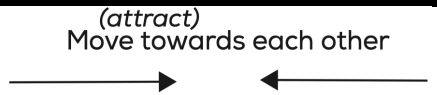
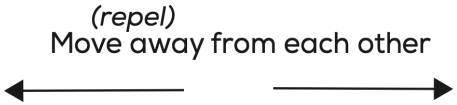
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SHADOW TEMPLATE ANSWER	
light from the (light source) ; travels in a straight line ; blocked; opaque / translucent	
	• closer to the light source • away from the screen • Fainter ; blurrier • away from the light source • Closer to the screen • Darker ; clearer / sharper

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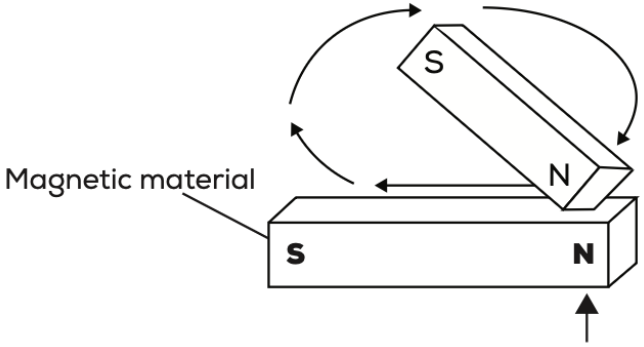
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BAR MAGNET	RING MAGNET	IDENTIFYING UNKNOWN OBJECTS
 strongest at its poles	 same throughout	 • Objects A and B are made of magnetic materials. • At least one of the objects must be a magnet.  • Objects C and D are made of magnetic materials. • Both objects are magnets. • No conclusions can be made.

Attraction	Repulsion
• Unlike poles of magnets (P) facing each other (F) attract (E). • Magnets attract magnetic materials.	• Like poles of magnets (P) facing each other (F) repel (E).

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CREATING MAGNETS	
 Use one pole of a magnet to stroke a magnetic material in one direction at least 30 times. • same ; more ; same • stronger magnet	The steel paper clips will remain stationary. Copper is a non-magnetic material and will not be magnetised to become an electromagnet to attract the steel paper clips. **S**teel **I**ron **N**ickel **C**obalt (not copper!) • coils / turns of wire around the magnetic object • batteries

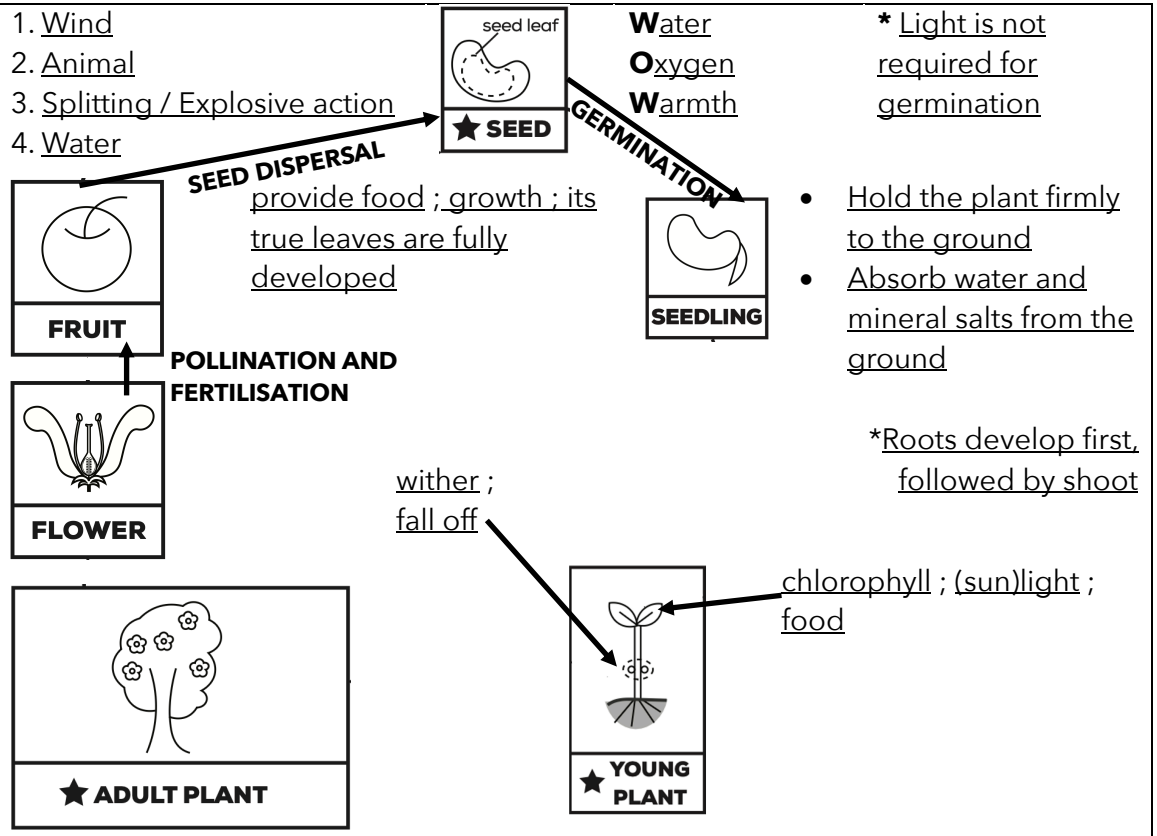
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transfer of pollen grains from the anther to the stigma (of the flower of the same species)

process where the male reproductive cell (in the pollen grain) fuses with the female reproductive cell (in the ovule)

Large and brightly coloured	Small and dull coloured
Scented	Non-scented
Present	Absent
Inside the flower	Hanging out of flower
Sticky stigma inside the flower	Large and feathery stigma protrudes out of flower

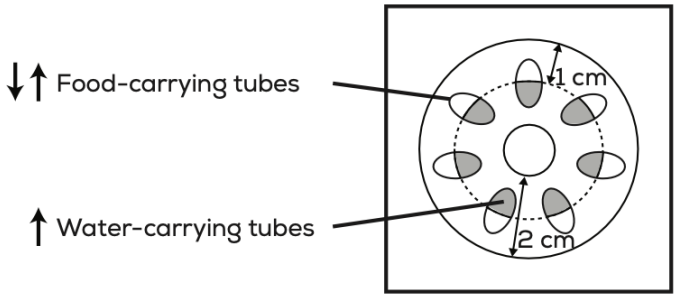


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TRANSPORT IN PLANTS

Cross-section of a Stem



W ater _____

I nside _____

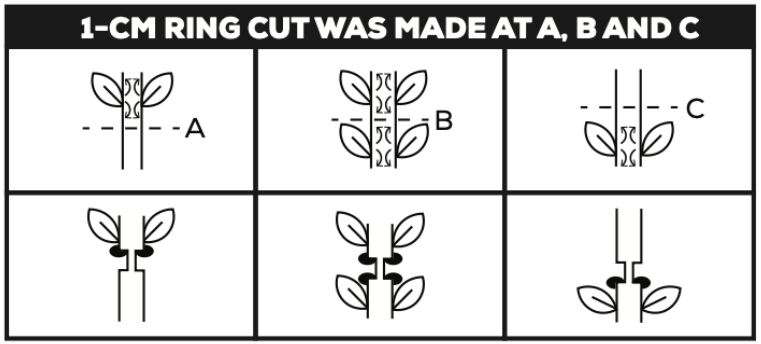
F ood _____

O utside _____

Both water and food-carrying tubes die

Food-carrying tubes

1) Swell



2) Bigger fruits

*More food transported to fruit X to be stored

3) Die

Roots cannot receive food

↓

Roots die

↓

Cannot absorb water

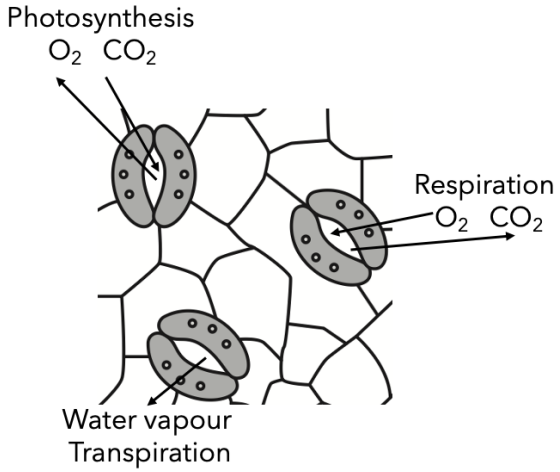
↓

Plant die

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FUNCTION OF THE STOMATA (TINY OPENINGS)



exchange of gases

- Oxygen **P**hotosynthesis
- Carbon dioxide **R**espiration
- Water vapour **T**ranspiration

underside

- Direct exposure to sunlight
- Water loss through the stomata as water vapour (in the process of transpiraton)

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work ; created ; destroyed (used up) ; converted

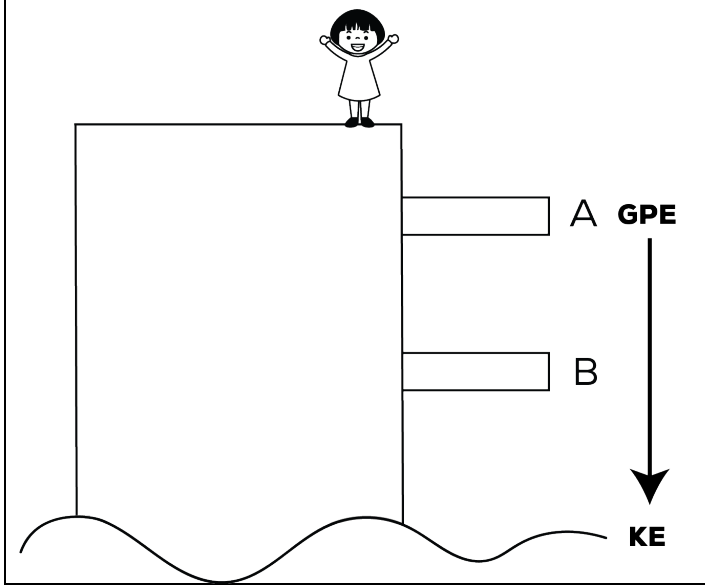
Converted ; change	**T**ransferred ; no change	**S**tored ; potential	**P**ossesses / **H**as ; all

6 FORMS OF ENERGY

Potential energy ; PE Kinetic energy ; KE Electrical energy ; EE Light energy ; LE Heat energy ; HE Sound energy ; SE	• Speed • Mass • Temperature • Volume	Gravitational potential energy ; GPE • Mass • Height of object above the ground Chemical potential energy ; CPE • Food, batteries and fuels Elastic potential energy ; EPE • Stiffness of elastic object • How much the elastic object is stretched or compressed

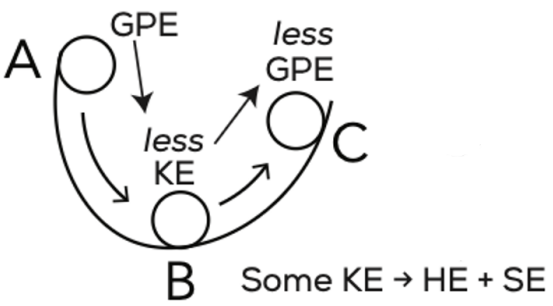
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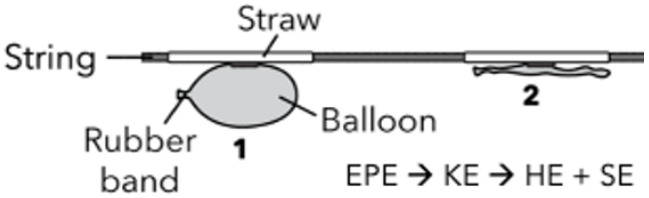
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	State the factor Use energy conversion	**C**hoose ; Point A **U**se data ; Jane is at a greater height above the water at point A. **E**xplain data ; Thus, Jane possesses/has MORE gravitational potential energy (GPE) at point A, which is converted to MORE kinetic energy (KE) as she is falling.

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<table>
<tr>
<td rowspan="3">


</td>
<td>SOME of the kinetic energy of the (object) was converted to heat energy and sound energy. Thus, the (object) will possess/have less kinetic energy, which is converted to less gravitational potential energy.</td>
</tr>
<tr>
<td>NOT ALL of the kinetic energy of the (object) was converted to heat energy and sound energy. / The (object) still possesses/has kinetic energy.</td>
</tr>
<tr>
<td>SOME of the kinetic energy of the (object) was converted to heat energy and sound energy.</td>
</tr>
<tr>
<td>ALL of the kinetic energy of the (object) was converted to heat energy and sound energy.</td>
</tr>
</table>

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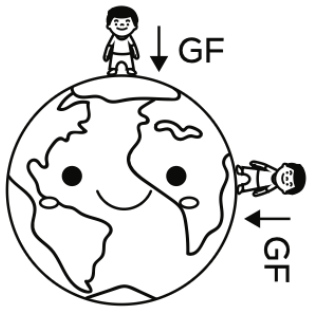
• push ; pull • see ; feel ; see	• Acting on • Between ____ and ____ • Greater than / smaller than / equal to • Overcome (not preferred)
EFFECTS	TYPES
1. stationary ; start 2. moving ; stop 3. moving ; direction 4. moving ; speed a. increase ; speed b. decrease ; speed 5. shape	1. Gravitational 2. Frictional 3. Elastic spring 4. Magnetic

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GRAVITATIONAL ; WEIGHT ; GRAVITY ; NON-CONTACT

pull (downwards towards the Earth)



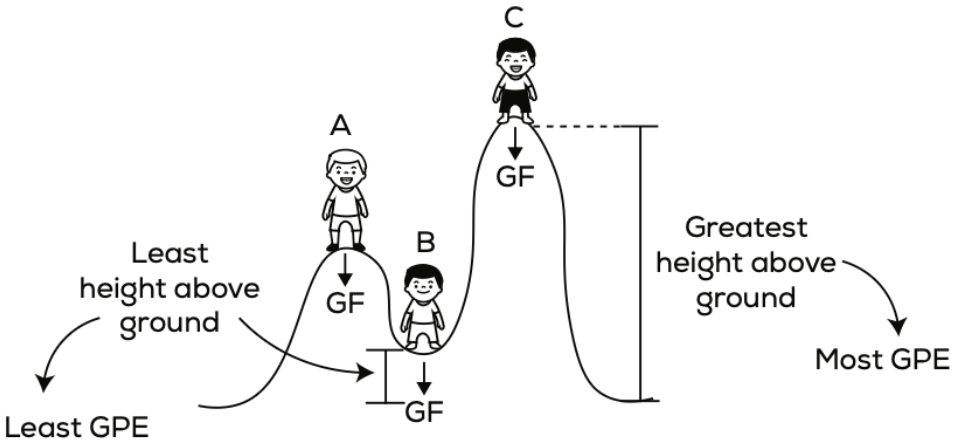
all times

1. Mass ; kg
2. Location

1 kg → 10 N	1 kg → 1.6 N
More gravitational force	Less gravitational force

Gravitational force ; Gravitational potential energy

Mass Location Mass Height above ground

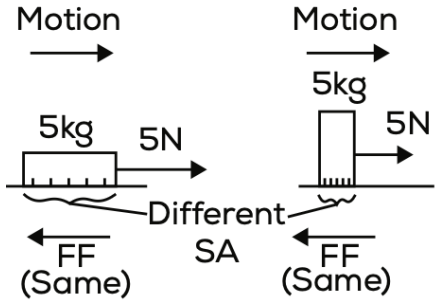


same gravitational force acting on them

GPE ; GPE		
C	A	B

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<table>
<tr><td colspan="3">FRICTIONAL ; FRICTION ; CONTACT</td></tr>
<tr>
<td>
• two surfaces rubbing
• Friction ; opposite
• Friction
1. Mass
2. Surface texture
surface area


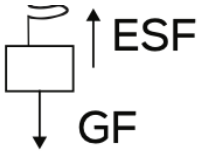
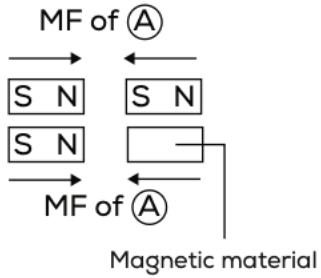
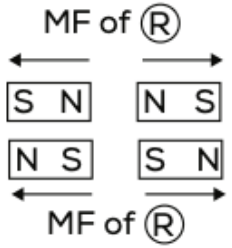
• Friction ; (Surface A) ; (Surface B)
</td>
<td>
• friction
1. Friction ; air ; (Air resistance) — A.R.
2. Friction ; water ; (Water resistance) — W.R.
A. (Exposed) surface area (ESA)

B. Streamlined
• Friction
1. Lubricants (e.g. oil, soap, water)
2. Rollers
3. Wheels
4. Ball bearings
5. Powder
</td>
<td>
Larger ESA, More A.R.

Less streamlined, more W.R.
</td>
</tr>
</table>

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ELASTIC SPRING ; CONTACT	MAGNETIC ; NON-CONTACT
 • stretched / compressed ; attached to / placed ; original	magnetic 1. Magnetic ; attraction ; pull 2. Magnetic ; repulsion ; push   (Steel, Iron, Nickel, Cobalt) • Distance • Type ; thickness • Magnetic strength

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