

Science Revision Guide: Grade 8 General

Term 2 Final Exam Comprehensive Revision
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Topic 1: Kinetic and Potential Energy / الطاقة الحركية وطاقة الوضع

English Keyword	Arabic Translation	Definition / المعنى
Kinetic Energy (KE)	الطاقة الحركية	Energy of an object in motion.
Potential Energy (PE)	طاقة الوضع	Stored energy due to position or state.
Gravitational PE	طاقة وضع الجاذبية	Energy based on height and mass.
Elastic Potential	طاقة وضع مرنة	Energy of a stretched object.

Lesson Summary / ملخص الدرس

- Kinetic energy (KE) is the energy of motion. / الطاقة الحركية هي طاقة الحركة.
- Potential energy (PE) is stored energy. / طاقة الوضع هي الطاقة المخزنة.
- KE depends on two factors: mass and speed. / الطاقة الحركية تعتمد على الكتلة والسرعة.
- Speed has more effect on KE than mass. / السرعة لها تأثير أكبر على الطاقة الحركية من الكتلة.
- When mass doubles, KE doubles. When speed doubles, KE quadruples (4 times). / عندما تتضاعف الكتلة، تتضاعف الطاقة الحركية، وعندما تتضاعف السرعة، تزداد 4 أضعاف.
- Elastic PE is energy in stretched objects (rubber bands). / طاقة الوضع المرنة هي طاقة الأجسام المشدودة مثل المطاط.
- Gravitational PE depends on mass, gravity, and height. / طاقة وضع الجاذبية تعتمد على الكتلة والجاذبية والارتفاع.
- Energy is measured in Joules (J). / تقاس الطاقة بوحدة الجول.

1.1 Multiple Choice Questions (MCQs)

1. Kinetic energy is the energy of an object that is:
a) Sleeping (b) Moving (c) Invisible (d) Stored
2. Potential energy is energy that is:
a) Moving fast (b) Light in weight (c) Stored (d) Broken
3. Energy stored in a battery or in food is called:
a) Chemical PE (b) Kinetic energy (c) Sound energy (d) Light energy

4. A heavy bus has _____ kinetic energy than a light bicycle moving at the same speed.
a) Less (b) More (c) Same (d) Zero
5. If a car moves TWICE as fast, its kinetic energy will increase by:
a) 2 times (b) 4 times (c) 10 times (d) It will decrease
6. Which point of a roller coaster has the MOST potential energy?
a) The highest hill (b) The bottom (c) The end of ride (d) The middle
7. If a bird is flying through the air, it possesses:
a) Only Kinetic Energy (b) Only Potential Energy (c) Both Kinetic and Potential (d) Neither
8. A rubber band that is stretched but not yet released has _____ energy.
a) Kinetic (b) Elastic Potential (c) Sound (d) Thermal

Topic 2: Energy Transformations and Work / تحولات الطاقة والشغل

English Keyword	Arabic Translation	Definition / المعنى
Work	الشغل	Result of force moving an object.
Conservation	حفظ الطاقة	Energy cannot be created or destroyed.
Thermal Energy	الطاقة الحرارية	Energy related to heat.
Friction	الاحتكاك	Force that opposes motion.

Lesson Summary / ملخص الدرس

- Work happens when force moves an object a distance. No movement = no work. / يحدث الشغل عندما تحرك القوة جسمًا لمسافة. لا توجد حركة = لا يوجد شغل.
- Conservation of Energy: Energy is only transformed or transferred, not created or destroyed. / قانون حفظ الطاقة: الطاقة لا تفنى ولا تستحدث، بل تتحول فقط.
- Pendulum at top: Maximum PE, minimum KE. / البندول عند القمة: أكبر طاقة وضع وأقل طاقة حركة.
- Pendulum at bottom: Minimum PE, Maximum KE. / البندول عند القاع: أقل طاقة وضع وأكبر طاقة حركة.
- Energy loss happens when friction transforms KE into thermal energy (heat). / فقدان الطاقة / يحدث عند تحولها لحرارة بسبب الاحتكاك.

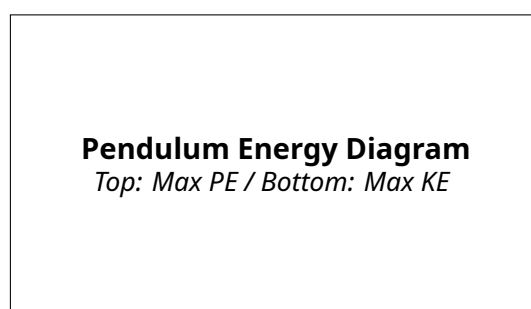


Figure 1: Energy transformations in a swinging pendulum.

2.1 Multiple Choice Questions (MCQs)

1. The Law of Conservation of Energy says energy cannot be:
a) Transferred (b) Created or Destroyed (c) Used (d) Seen
2. If you push a wall but it does NOT move, what is the Work done?
a) Maximum Work (b) Zero Work (c) High Work (d) 100 Joules
3. Analyze the pendulum: As it swings from the top to the bottom, energy changes from:
a) Kinetic to Potential (b) Potential to Kinetic (c) Chemical to Sound (d) No change
4. When you rub your hands together, Kinetic energy is transformed into:

- a) Potential energy (b) Nuclear energy (c) Thermal (heat) energy (d) Chemical energy
5. If you push a heavy box with a force of 50N, but the box **stays still**, the work done is:
- a) 50 Joules (b) 25 Joules (c) Zero Joules (d) 100 Joules
6. At the very bottom of its swing, a pendulum has _____.
- a) Maximum Potential Energy (b) Maximum Kinetic Energy (c) Minimum Kinetic Energy (d) No Energy
7. Some energy is lost in machines when **friction** transforms kinetic energy into:
- a) Sound Energy (b) Gravitational Energy (c) Thermal (Heat) Energy (d) Elastic Energy

2.2 Matching Activity / نشاط التوصيل

Condition / Situation	Energy State	Answer
1. Top of pendulum swing	A. Energy changes to Thermal (heat)	1. _____
2. Bottom of pendulum swing	B. Maximum Potential Energy	2. _____
3. Effect of Friction	C. Maximum Kinetic Energy	3. _____

Topic 3: Magnetic Fields and Forces / المجالات والقوى المغناطيسية

English Keyword	Arabic Translation	Definition / المعنى
Ferromagnetic	مغناطيسية حديدية	Materials attracted to magnets.
Magnetic Poles	الأقطاب المغناطيسية	North and South ends.
Magnetic Field	المجال المغناطيسي	Area of force around a magnet.
Repel	تنافر	Push away from each other.

Lesson Summary / ملخص الدرس

- Magnets attract ferromagnetic materials like Iron and Nickel. / المغناطيس يجذب المواد المغناطيسية / الحديدية مثل الحديد والنيكل.
- Magnetic Field: The region around a magnet where force is felt. / المجال المغناطيسي: المنطقة / حول المغناطيس حيث تظهر قوته.
- Ends of a magnet are called poles (North and South). Every magnet has two. / تسمى أطراف / المغناطيس بالأقطاب (شمالي وجنوبي). كل مغناطيس له قطبان.
- Magnetic force is strongest at the poles. / القوة المغناطيسية تكون أقوى ما يمكن عند الأقطاب.
- Opposite poles attract (N-S). Similar poles repel (N-N or S-S). / الأقطاب المختلفة تتجاذب والمتشابهة / تتنافر.

3.1 Multiple Choice Questions (MCQs)

1. The region around a magnet where force can be felt is the:
a) Electric field (b) Magnetic field (c) Gravity field (d) Static field
2. Two opposite magnetic poles (North and South) will:
a) Repel each other (b) Push away (c) Attract each other (d) Melt
3. Magnetic force becomes _____ as two magnets move farther apart.
a) Stronger (b) Weaker (c) The Same (d) Hotter
4. What material is most likely to be attracted to a magnet?
a) Plastic (b) Copper (c) Iron (d) Wood
5. If you break a magnet in half, each piece will have:
a) Only a North pole (b) Only a South pole (c) Both North and South poles (d) No poles
6. Where is the force of a bar magnet **strongest**?
a) In the center (b) At the magnetic poles (c) Around the sides (d) It is the same everywhere
7. Which of these pairs of metals are considered **ferromagnetic** materials?
a) Gold and Silver (b) Iron and Nickel (c) Copper and Aluminum (d) Wood and Plastic

8. Which of these will **repel** a North pole?

- a) A South pole (b) A piece of steel (c) Another North pole (d) A plastic rod

Topic 4: Electricity and Static Charges / الكهرباء والشحنات الساكنة

English Keyword	Arabic Translation	Definition / المعنى
Electric Force	القوة الكهربائية	Attraction or repulsion of charges.
Proportional	طردي	One increases, the other increases.
Inversely	عكسي	One increases, the other decreases.
Conductor	موصل	Allows movement of charges.

Lesson Summary / ملخص الدرس

- Two types of charges: positive (+) and negative (-). / هناك نوعان من الشحنات: موجبة وسالبة.
- Opposites attract; similar charges repel. / الشحنات المختلفة تتجاذب والمتشابهة تتنافر.
- Electric force depends on **charge** and **distance**. / تعتمد القوة الكهربائية على الشحنة والمسافة.
- Higher charge = stronger force (Directly proportional). / شحنة أكبر = قوة أقوى (تناسب طردي).
- More distance = less force (Inversely proportional). / مسافة أكبر = قوة أقل (تناسب عكسي).
- Conductors (metals) allow charge movement; Insulators (rubber/plastic) do not. / الموصلات تسمح بحركة الشحنات، بينما العوازل تمنعها.

4.1 Multiple Choice Questions (MCQs)

1. A positive charge and a negative charge will:
a) Push each other (b) Attract each other (c) Repel each other (d) Stay still
2. A material that allows electric current to move easily is a:
a) Insulator (b) Conductor (c) Magnet (d) Battery
3. Rubber and Plastic are examples of:
a) Conductors (b) Insulators (c) Metals (d) Magnets
4. If you rub a balloon and it sticks to a wall, the force is:
a) Magnetic force (b) Electric force (c) Friction force (d) Gravity force
5. How does the electric force change if the **amount of charge** on an object increases?
a) The force gets stronger (b) The force gets weaker (c) The force stays the same
(d) The force disappears
6. If you move two charged objects **further apart**, what happens to the force between them?
a) It becomes stronger (b) It becomes weaker (c) It remains constant (d) It turns into magnetic force
7. Which of these is a good **conductor**?
a) Glass (b) Wood (c) Silver (d) Paper
8. What will happen if you bring a **positive** charge near another **positive** charge?
a) They will attract (b) They will repel (c) They will stay still (d) They will melt

Topic 5: Circuits and Electromagnetism / الدوائر والكهرومغناطيسية

English Keyword	Arabic Translation	Definition / المعنى
Voltage	الجهد الكهربائي	The "push" for electrons.
Switch	مفتاح	Controls current flow.
Electromagnet	مغناطيس كهربائي	Magnet produced by electric current.
Coils	لفات الأسلاك	Wire loops around a core.

Lesson Summary / ملخص الدرس

- Electricity requires: battery, conductors, and a closed circuit. / تتطلب الكهرباء: بطارية، موصلات، ودائرة مغلقة.
- Switch ON = closed circuit = current flows. / المفتاح مفتوح (ON) = دائرة مغلقة = تدفق تيار.
- Switch OFF = open circuit = no current flows. / المفتاح مغلق (OFF) = دائرة مفتوحة = لا يوجد تيار.
- Battery provides voltage (the push to move electrons). / البطارية توفر الجهد (الدفع لتحريك الإلكترونات).
- More voltage = more current = brighter light. / جهد أكبر = تيار أكبر = ضوء أقوى.
- Electric current produces a magnetic field (Electromagnet). No current = No magnet. / التيار ينتج مجالاً مغناطيسياً. لا يوجد تيار = لا يوجد مغناطيس.
- Stronger electromagnet needs more current or more wire coils. / لتقوية المغناطيس الكهربائي نحتاج تياراً أكثر أو لفات أسلاك أكثر.

5.1 Multiple Choice Questions (MCQs)

1. For electric current to flow, the circuit must be a:
a) Open loop (b) Broken wire (c) Closed loop (d) Large circle
2. Turning a switch to "OFF" creates an _____ circuit.
a) Closed (b) Open (c) Working (d) Fast
3. To make an electromagnet stronger, you should add more:
a) Plastic tape (b) Wire coils (c) Cold water (d) Space
4. Analyze the circuit: If you replace a 1.5V battery with a 9V battery, what happens?
a) Current decreases (b) Bulb becomes brighter (c) Wires disappear (d) Switch turns off
5. What happens to an **electromagnet** if the electric current stops flowing?
a) It becomes a permanent magnet (b) It stops being a magnet (c) It gets stronger (d) It changes poles
6. Which component provides the energy source for a circuit?
a) Switch (b) Battery (c) Wire (d) Light bulb

7. An electromagnet is different from a permanent magnet because it can be:
- a) Broken (b) Turned on and off (c) Seen (d) Found in rocks
8. In a circuit, **voltage** can be described as the _____ to the electrons.
- a) Resistance (b) Insulation (c) Push (d) Magnetism

Read the pages included in the exam blueprint

راجع الصفحات الموجودة في هيكل الاختبار

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