

**ELECTRICITY – DC & AC Currents (Physiotherapy / Electrotherapy Foundations)**

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**Class Size & Organization**

**Total students:** 100

**Team formation:** 10 teams × 10 students each

**Roles per team (rotate each puzzle):**

Team Leader

Recorder

Timekeeper

Presenter

Circuit Analyst (2)

Safety Officer

Clinical Integrator (2)

Observer

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**Game Rules (Applicable to All Puzzles)**

**Time per puzzle:** 20 minutes

15 minutes discussion

5 minutes reporting

**Materials allowed:** Only provided worksheets (circuit diagrams, waveform charts, patient cards)

**Participation:** Every student must contribute

**Reporting:** 2-minute explanation per team

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**Scoring Rubric (10 points per puzzle)**

Correct concept / diagnosis – **3 points**

Logical reasoning & justification – **3 points**

Clinical or practical application – **2 points**

Safety & parameter selection – **1 point**

Teamwork & clarity – **1 point**

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**PUZZLE SET: 10 CASE-BASED ELECTRICITY GAMES**

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**Puzzle 1: The Dead Machine (Bloom: Apply)**

**Story:** A physiotherapy clinic reports that their electrotherapy unit is not delivering current despite being switched ON.

**Clues:**

Power source intact

Circuit diagram provided

**Tasks:**

Identify whether DC or AC is required

Apply basic electrical concepts to find the fault

Suggest correction

**Focus:** Basic electrical concepts & current flow

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**Puzzle 2: The Tingling Patient (Bloom: Apply)**

**Story:** A patient reports tingling only at the start of stimulation, which then fades.

**Clues**

Constant polarity

Flat waveform diagram

**Tasks:**

Identify current type

Explain accommodation

Clinical implication

**Focus:** DC currents & physiological effects

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**Puzzle 3: The Painful Shock (Bloom: Analyze)**

**Story:** A student accidentally increases intensity rapidly; patient feels sudden shock.

**Clues:**

Steep waveform rise

High peak amplitude

**Tasks:**

Analyze waveform characteristics

Identify AC vs DC

Suggest safer modification

**Focus:** AC waveforms & patient comfort

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**Puzzle 4: The Burnt Electrode (Bloom: Analyze)**

**Story:** A patient develops skin irritation after treatment.

**Clues:**

Small electrode size

High current density

**Tasks:**

Apply Ohm's Law

Explain resistance & density

Preventive measures

**Focus:** Ohm's Law & tissue resistance

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**Puzzle 5: The Silent Circuit (Bloom: Analyze)**

**Story:** Current meter shows zero despite intact wires.

**Clues:**

Open switch

Circuit schematic

**Tasks:**

Identify circuit type

Locate interruption

Restore current flow

**Focus:** Series & parallel circuits

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**Puzzle 6: The Smooth Stimulation (Bloom: Evaluate)**

**Story:** A therapist wants smoother muscle contraction without sudden jerks.

**Clues:**

Variable intensity control available

**Tasks:**

Evaluate need for rheostat

Decide placement in circuit

Clinical advantage

**Focus:** Rheostats & current control

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**Puzzle 7: The Stored Shock (Bloom: Analyze)**

**Story:** After switching OFF the unit, patient still feels mild discharge.

**Clues:**

Capacitor symbol in circuit

**Tasks:**

Identify component

Explain charge storage

Safety precaution

**Focus:** Capacitors

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**Puzzle 8: Waveform Designer (Bloom: Create)**

**Story:** A therapist wants minimal skin irritation with effective stimulation.

**Tasks:**

Design ideal waveform

Choose AC or DC

Justify frequency & duration

**Focus:** Waveform design & clinical reasoning

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**Puzzle 9: Ohm's Law Challenge (Bloom: Evaluate)**

**Story:** Different patients show different sensations with same intensity setting.

**Clues:**

Varying skin resistance values

**Tasks:**

Apply  $V = IR$

Predict current changes

Adjust treatment parameters

**Focus:** Clinical application of Ohm's Law

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**Puzzle 10: Build a Safe Circuit (Bloom: Create)**

**Story:** You are setting up an electrotherapy unit for a new clinic.

**Tasks:**

Design a safe DC/AC circuit

Label components

Include safety controls

**Focus:** Integration of electrical concepts into practice

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**Assessment & Reflection**

Announcement of top 3 teams

Individual reflection (5 minutes): *“One electrical concept I can now apply clinically”*

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### **Learning Outcome**

These **10 electricity-based clinical games** convert abstract electrical concepts into **interactive, story-driven, team-based learning**, improving understanding, safety awareness, and long-term retention.

I've prepared a **complete, classroom-ready case-based learning module on ELECTRICITY (DC & AC Currents)** tailored for **100 students**, using the **same puzzle-game, Bloom's taxonomy-aligned approach** you requested.