**🎯 Activity 4: 🎮 Mini-Game – "Shape Shifter Challenge"**

**🎙️ Activity Introduction 🎙️ *(Mic Icon)***

“Metals have superpowers! They can bend, flatten, or stretch without breaking. In this game, you will explore how metals behave when hammered or pulled. Watch the short scenario or read the description and choose the property shown: Is it malleability or ductility? Let us test your science instincts!”

**👨‍💻 Developer Guide Instructions**

* **Type**: Decision-Based Mini-Game
* **Rounds**: 6 scenario-based multiple-choice questions
* **Choices for Each Round**:
  + 🔨 Malleability
  + 🧵 Ductility
  + ❌ Hardness (Distractor)
  + ❌ Elasticity (Distractor)
* **Interaction**:
  + Display a scene or animation followed by 4 clickable answer buttons.
  + Provide specific feedback for each choice made.
  + Use appropriate sound effects for correct and incorrect answers.

**📋 Learner Instructions (On-Screen)**

1. Read or watch each scenario carefully.
2. Decide which property of metal is being shown.
3. Click on your chosen answer.
4. Read the feedback to understand why it is correct or incorrect.

**💡 Hint (On-Screen)**

* **Malleability**: The ability of a metal to be hammered or pressed into thin sheets without breaking.
* **Ductility**: The ability of a metal to be stretched into thin wires without breaking.
* **Hardness**: The resistance of a material to being scratched or dented.
* **Elasticity**: The ability of a material to return to its original shape after being stretched or compressed.

**🧪 Activity Content – Scenarios, Choices, and Feedback**

**Scenario 1**

**Text**: A blacksmith hammers a heated metal sheet into a flat pan.

* 🔨 Malleability ✅ → “This shows malleability – the ability to be hammered into sheets.”
* 🧵 Ductility ❌ → “This is not being pulled into wire, so it is not ductility.”
* ❌ Hardness ❌ → “Hardness is about resisting scratches, not reshaping.”
* ❌ Elasticity ❌ → “Elasticity refers to returning to original shape, which is not shown here.”

**Scenario 2**

**Text**: Copper is stretched into long, thin wire in a factory.

* 🔨 Malleability ❌ → “Hammering is malleability. Here, the metal is being stretched.”
* 🧵 Ductility ✅ → “Ductility is the ability to be drawn into wire.”
* ❌ Elasticity ❌ → “Elasticity is about bouncing back, not permanent shaping.”
* ❌ Hardness ❌ → “Hardness is unrelated to forming wire.”

**Scenario 3**

**Text**: A goldsmith rolls gold into ultra-thin foil for decoration.

* 🔨 Malleability ✅ → “Rolling into thin sheets is an example of malleability.”
* 🧵 Ductility ❌ → “The metal is not being stretched into wire.”
* ❌ Elasticity ❌ → “Elasticity is not about permanent shaping like this.”
* ❌ Hardness ❌ → “Rolling into foil does not test hardness.”

**Scenario 4**

**Text**: Aluminium is drawn into wire for power lines.

* 🔨 Malleability ❌ → “Malleability is shaping by hammering, not stretching.”
* 🧵 Ductility ✅ → “This is a perfect example of ductility.”
* ❌ Hardness ❌ → “Hardness is about resisting scratching, not forming wire.”
* ❌ Elasticity ❌ → “The metal is not bouncing back, so it is not elasticity.”

**Scenario 5**

**Text**: A stamping machine presses soft metal into a coin shape.

* 🔨 Malleability ✅ → “This is malleability – shaping by pressing or hammering.”
* 🧵 Ductility ❌ → “It is not being drawn into wire.”
* ❌ Hardness ❌ → “Coin-making uses softness, not resistance to scratches.”
* ❌ Elasticity ❌ → “Elasticity is not shown in pressing operations.”

**Scenario 6**

**Text**: Gold is stretched into very thin threads for jewellery.

* 🔨 Malleability ❌ → “Malleability involves flattening, not pulling into thread.”
* 🧵 Ductility ✅ → “Gold is highly ductile and ideal for thread making.”
* ❌ Elasticity ❌ → “Elasticity does not apply. Gold is permanently stretched here.”
* ❌ Hardness ❌ → “Hardness does not describe the ability to stretch into wire.”

**🎙️ Activity Conclusion**

“You have now mastered the difference between malleability and ductility. Malleable metals can be hammered or pressed into thin sheets, while ductile metals can be stretched into wires. These properties make metals essential in construction, wiring, manufacturing, and decorative applications.”

**✅ Key Takeaways:**

* **Physical state:** Mostly solid at room temperature (except mercury).
* **Conductivity:** Good conductors of heat and electricity due to free electrons.
* **Mechanical properties:** Malleable (sheets) and ductile (wires).
* **Appearance:** Shiny when cut/polished; some tarnish quickly.
* **Examples & demonstrations:** Iron, copper, aluminium, etc.; shown through conductivity, malleability, and ductility tests.