**🎯 Activity 4: 🔄 Sequence the Steps – “How Stainless Steel is Made”**

**🎙️ Activity Introduction**

“Have you ever wondered how stainless steel becomes shiny and rust-free? In this task, you will rebuild the process step-by-step—from digging iron from the ground to polishing the final product. Observe each stage and drag it into the correct order!”

**👨‍💻 Developer Guide Instructions**

* **Type**: Ordering / Sequencing Task
* **Display Style**: Vertical or horizontal drag-and-drop list
* **Assets Needed**:
  + [📸] Visual cards for each step (e.g., iron ore, furnace, metal mix, mould, polish)
  + [🔉] Short audio narration clips per step (optional for accessibility)
  + Progress tracker with icons for each attempt
* **Interaction Logic**:
  + Each time a learner completes the order, show individual feedback for each step
  + Use snap animations and simple transition effects for engagement
  + Unlock 🏅 badges after each successful try

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

1. Read the description of each stage carefully.
2. Drag and drop the steps into the sequence you think is correct.
3. Submit your sequence to check your answers.
4. Review the feedback and adjust until the order is correct.

**💡 Hint (On-Screen)**

* The process begins with obtaining the main raw material.
* Strengthening and corrosion-resisting elements are added before melting.
* Shaping happens after melting and mixing.
* Polishing is always the last stage.

**🧩 Activity Content – Steps to Sequence (Correct Order with feedbacks)**

1. **Extract Iron from Ore**  
   "This is the raw material stage. Dig the iron out of the earth."
2. **Add Carbon and Chromium**  
   "Carbon strengthens. Chromium adds rust protection."
3. **Melt and Mix the Materials**  
   "All ingredients go into a furnace to become one metal."
4. **Cast and Cool the Mixture into Shape**  
   "Now the liquid metal is poured into shapes and left to cool."
5. **Polish for Corrosion Resistance**  
   "The surface is polished for smoothness and rust resistance."

**🗨️ Facilitative Feedback for Each Choice**

* **If Step 2 placed first:**  
  ❌ "Before adding anything, iron must be extracted from ore."
* **If Step 3 placed before Step 2:**  
  ❌ "You cannot melt it before adding all elements—Carbon and Chromium come first."
* **If Step 4 placed before Step 3:**  
  ❌ "You can only cast and cool once the mixture is molten."
* **If Step 5 placed too early:**  
  ❌ "Polishing is the final step, after shaping the metal."

**🎙️ Activity Conclusion**

“Excellent sequencing! Stainless steel production follows a precise process—from raw material to a corrosion-resistant finish. You now understand the science and engineering behind everyday metal items!”

**✅ Key Takeaways:**

* **Alloys** are uniform mixtures of metals (or metals with non-metals), made by mixing in molten form then cooling.
* **Purpose:** Increase hardness, strength, resistance to corrosion, or improve appearance.
* **Examples:** Steel (Fe + C), Stainless Steel (Fe + Cr + Ni + C), Brass (Cu + Zn), Bronze (Cu + Sn), Duralumin (Al + Cu + Mn + Mg).
* Alloy particles **block atom sliding**, making them stronger than pure metals.