**🎯 Activity 4: 🧩 Puzzle Game – “Atom Builder”**

🎙️ **Activity Introduction** 🎤  
“Atoms are like tiny puzzles made of special pieces. In this game, you will build your own atom by placing the nucleus, protons, neutrons, and electrons where they belong. Think carefully — every particle has a place and a role. Let us construct the atom together!”

**Learner Instructions (On Screen)**

1. Drag the nucleus to the atom centre.
2. Add protons (🔴) and neutrons (⚪) into the nucleus.
3. Drag electrons (🔵) into the correct energy levels:  
   o 1st shell: up to 2 electrons  
   o 2nd shell: up to 8 electrons

**Hint (On Screen)**  
• Protons are red and go in the nucleus.  
• Neutrons are grey and also stay in the nucleus.  
• Electrons are blue and orbit in shells outside the nucleus.  
• First shell holds 2 electrons.  
• Second shell holds up to 8 electrons.

**Media Suggestions**  
• [🎞️ Drag-and-drop puzzle frame with atom outline]  
• [🎞️ Particle icons: 🔴 Protons, ⚪ Neutrons, 🔵 Electrons]  
• [🎞️ Snap animation + glowing outline when correctly placed]

**Developer Guide**  
• Divide the activity into 3 phases:  
Phase 1: Drag nucleus into centre slot  
Phase 2: Drag multiple protons/neutrons into nucleus  
Phase 3: Drag electrons into two distinct orbit shells (drag logic must validate electron limits per shell)  
• Use auto-lock when a piece is placed correctly  
• Play facilitative feedback after each item drop  
• Include “Reset Puzzle” and “Try Again” buttons

**Puzzle Interactions and Facilitative Feedbacks**  
**Placing the Nucleus**  
• ✅ Correct placement:  
“Good start! The nucleus is the centre of the atom. Now let us fill it with particles.”  
• ❌ Wrong placement:  
“The nucleus must go at the atom’s core. Look for the centre slot.”

**🔴 Placing Protons**  
• ✅ In nucleus:  
“Correct! Protons are positively charged and sit in the nucleus.”  
• ❌ In energy shells:  
“Protons do not orbit. Move them into the centre — the nucleus.”

**⚪ Placing Neutrons**  
• ✅ In nucleus:  
“Well done! Neutrons stay in the nucleus and have no charge.”  
• ❌ In orbitals:  
“Neutrons belong in the centre. Only electrons orbit.”

**🔵 Placing Electrons – 1st Shell**  
• ✅ Up to 2 in 1st shell:  
“Excellent! The first shell holds a maximum of 2 electrons.”  
• ❌ More than 2 in 1st shell:  
“Too many! The first shell can only hold 2 electrons. Try the next shell.”

**🔵 Placing Electrons – 2nd Shell**  
• ✅ Up to 8 in 2nd shell:  
“Great! The second shell can hold up to 8 electrons.”  
• ❌ More than 8 in 2nd shell:  
“Careful! The second shell is full after 8 electrons.”

🎙️ **Activity Conclusion** 🎤  
“Amazing construction! You have placed every part of the atom correctly. Protons and neutrons stay in the nucleus, while electrons orbit in energy levels. Understanding this structure is key to exploring chemistry. Keep building your science knowledge!”