**🎯 Activity 3: 🧪 Challenge – “Count the Valence Electrons!”**

**🎙️ Activity Introduction**   
"Every element hides a secret in its outer shell. That secret? The valence electrons! These outer electrons determine how elements react and combine. In this challenge, count the valence electrons from each arrangement. Stay sharp—outermost shell only!"

**👨‍💻 Developer Guide Instructions**

* **Activity Type:** Multiple-choice valence electron quiz.
* **Question Format:** Electron arrangement given; learner selects the number of valence electrons.
* **Display:** Show arrangement numerically and as an optional visual diagram.
* **Feedback Mechanism:** Provide facilitative feedback for each choice.
* **Audio:** Clicking, counting SFX; success chimes for correct answers.
* **Interactivity:** Allow retry after incorrect selection before moving to the next question.

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

1. Look at the electron arrangement given in the question.
2. Focus on the **outermost shell** only.
3. Select the number that represents the valence electrons.
4. Check the feedback to see if your choice was correct or incorrect.

**💡 Hint Panel (On-Screen)**

**Key Reminders:**

* Valence electrons are the electrons in the **outermost shell**.
* The **first shell** can hold up to 2 electrons, the **second shell** up to 8, and the **third shell** also up to 8.
* Do not add all electrons together — only count the ones in the **last shell**.

**🧪 Activity Content with Specific Facilitative Feedback**

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| --- | --- | --- | --- | --- |
| **Question** | **Electron Arrangement** | **Option** | **Correct/Incorrect** | **Facilitative Feedback** |
| Q1 | 2.8.6 | 2 | ❌ Incorrect | These belong to the first shell. Valence electrons are only in the outermost shell. |
|  |  | 8 | ❌ Incorrect | This is the second shell. Check the last shell for valence electrons. |
|  |  | 6 | ✅ Correct | The outermost shell has 6 electrons—these are the valence electrons. |
|  |  | 16 | ❌ Incorrect | That is the total number of electrons, not the valence electrons. |
| Q2 | 2.1 | 1 | ✅ Correct | Only 1 electron sits in the outermost shell, so the valence number is 1. |
|  |  | 2 | ❌ Incorrect | The first shell has 2, but it is not the outermost in this case. |
|  |  | 3 | ❌ Incorrect | Count carefully. There are only 2 shells—check the last one. |
|  |  | 0 | ❌ Incorrect | There is 1 electron in the outermost shell. |
| Q3 | 2.8.8.1 | 8 | ❌ Incorrect | This is from the third shell. But there is a fourth shell with more electrons. |
|  |  | 1 | ✅ Correct | The outermost shell has 1 electron—this is the valence count. |
|  |  | 17 | ❌ Incorrect | This is the total of all electrons. Focus only on the last shell. |
|  |  | 0 | ❌ Incorrect | There is 1 electron in the outermost shell. |
| Q4 | 2.5 | 5 | ✅ Correct | The outer shell has 5 electrons. |
|  |  | 2 | ❌ Incorrect | This is from the first shell, not the outermost. |
|  |  | 7 | ❌ Incorrect | Look closely. Only 5 are in the last shell. |
|  |  | 10 | ❌ Incorrect | That is more than the total electrons. |
| Q5 | 2.8.7 | 7 | ✅ Correct | The third shell holds 7 electrons, making them valence electrons. |
|  |  | 8 | ❌ Incorrect | That is the number in the second shell, not the outermost. |
|  |  | 1 | ❌ Incorrect | Only 1 electron would be found in atoms like sodium. Look again. |
|  |  | 17 | ❌ Incorrect | That is the total number of electrons. |

**🎙️ Activity Conclusion**  
"Fantastic! You have mastered the skill of counting valence electrons. These outermost electrons explain how atoms bond, react, and form compounds. Keep using this skill to classify and predict element behaviour!"