1. **Lecture/Open-ended Questioning**: Lecture in 7 to 10 minute segments with preplanned open-ended questions between segments. Ask students to record their answers in their notes, share with the person sitting next to them, and share with the class.

2. **Class discussion led by teacher/students**: Formal or informal discussion primed by open-ended process types of questions. When using this technique be sure to stick to the class objectives, make the expectations clear, and focus on only one issue with the varying views or opinions raised.

3. **Demonstration**: Instructor shows how a skill should be performed and/or observes students performing a skill and provides feedback throughout the process.

4. **Graphic organizers**: A graphic organizer is a visual display that demonstrates relationships between facts, concepts or ideas (e.g. flow charts, concept maps, storyboards, venn diagrams). They are useful as part of lectures or as a reinforcement activity to help students clarify, demonstrate, or build upon what they have learned.

5. **Case Studies**: Study a singular instance or event that can be studied to illustrate a concept. The most motivating and effective case studies involve real people and real problems that must be solved. There is often no clear-cut answer, but many possible solutions that strengthen the critical thinking skills and the problem solving skills of the students.

6. **Literature review**: Students read and reflect on articles in professional journals in order to become familiar with course content and current research. One way to accomplish this is through a one-page review with three paragraphs. In the first paragraph students summarize the content. In the second paragraph students describe strengths and weaknesses of the study. Finally, in the third paragraph students apply the information in a practical way.

7. **Problem solving activities**: Provide problem scenarios for students to work through in small groups. Students should work together to brainstorm multiple solutions to the problem. Each group then shares their solutions or their best solution during a class discussion. To help students consider new information when in a real world situation integrate a change to the scenario part way through the problem solving process.
8. **Think, Pair, Share:** Students first think about possible answers to a posed question. Students then share their answers with the person sitting next to them before sharing with the entire class.

9. **Student presentations/Peer teaching:** Students assume professional roles when presenting course content to the class. Peer teaching has significant gains on learning while increasing the communication skills of students.

10. **Jig-saw activities:** Students work in groups to become an “expert” on a certain topic or course concept. Each group focuses on a different concept and the groups are then remixed so there is one “expert” for every topic in each group. The group members then teach the members of their new group about their topic. Students may create fact sheets, notes, brochures, or other written materials to share with the members of their new group. These written materials will help ensure all students receive all of the information. For example, you may place students in five groups where each group studies a crop and creates a fact sheet providing information about that crop. Once the fact sheets are completed, you will refigure the groups so there is one person per crop in each group. Students will share their fact sheets with one another in their group and present the information. Students would then have fact sheets, information, and their notes about five different crops.

11. **Debate:** Informal or formal debate on current issues related to the course content. When using this technique allow students time to prepare for their side of the argument, and set expectation and ground rules prior to the debate.

12. **Misconception check:** Use this technique at the beginning of a new topic to gain understanding about students’ preconceptions and prior knowledge related to a topic. Pose a specific question or ask students to write what they know about the topic that will be covered. Ask students to share their answers on the board in the front of the room. These answers can then be referred to throughout the class making the content relevant to what students already know or thought they knew.

13. **One-Minute Papers:** Students write for one minute about a specific question. This question can be used to link new information to prior knowledge, begin to relate what they have learned to what will be learned or simply reflect on learning. This technique is well suited for the end of class.
14. **Muddiest Point**: This technique is similar to one minute papers, but students write the “most confusing” points. This technique is good to use at the end of the class period. Students identify what they don’t understand and the instructor gains insight into what concepts still need to be reinforced.

15. **Consultant Letter**: Ask students to work as “consultants” to solve real-world problems people in the industry face. Students should be provided with a “request” letter outlining the problem which they will serve as a “consultant” for. Students then research the problem, create a detailed plan/solution, and communicate their solution through a written letter or a presentation.

16. **Concept Sharing Rotations**: Use multiple boards or plain posters set up around the room. On the posters assign a topic, prompt, or question. Have students rotate around to each of the posters to share their knowledge about the topic/prompt or question. This is great to use as a review or as a way to identify what the students already know. An example of using this technique is to review the stages of mitosis or meiosis: Place four posters around the room with each poster labeled with one of the stages. Ask students to work in groups to write what they know about each of the stages. Allow 3 to 5 minutes per group at each of the posters. Then facilitate a class discussion to talk about what might be missing, what is not missing, and what might be misunderstandings.

17. **Picture Prompt**: Show students an image or diagram with no explanation. Ask students to write about the image using terms and concepts from the lecture. Do not give the “answer” until students have explored all possibilities. This also works well as a small group activity. For example, after teaching a lesson on flower morphology, show students a picture of a complete, perfect, and imperfect flower. Be sure that the picture does not have any labels on it. Ask the students to draw the diagram in their notes, and label as much of it as possible. Also ask them to write definitions or explanations for each of their labels. Have the students discuss their pictures in groups before discussing the answers as a class.

18. **Pass the Pointer**: Show a complex image or diagram on the board. Pass the laser pointer around the room to different students asking them to identify, describe, or explain certain aspects of the image.
19. **Word/Concept of the Day:** At the beginning of the class introduce a word or concept of the day. Ask students to write everything they know about the word or concept. Students can then add to this list throughout class. At the end of class facilitate a short discussion covering the concepts they learned and any misconceptions they had.

20. **3, 2, 1:** Use this strategy to help students reflect on a lecture, discussion, e-module, or other text. Ask students the following three questions: What are 3 things you learned? What are 2 things you found interesting? What is 1 question you still have? Have students discuss their answers to these questions in small groups before discussing as a class. Ask students to try to answer the final question for one another before answering it for them.

**References:**

