

**PEDAGOGY OF PHYSICAL SCIENCE, 1<sup>ST</sup> YEAR, COURSE-7(A), UNIT -03,  
FOUNDATION OF PHYSICAL SCIENCE, -----BY RAJU KUMAR  
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## **LEARNING BY SCAFFOLDING**

In education, **scaffolding** refers to a variety of instructional techniques used to move students progressively toward stronger understanding and, ultimately, greater independence in the learning process. The term itself offers the relevant descriptive metaphor: teachers provide successive levels of temporary support that help students reach higher levels of comprehension and skill acquisition that they would not be able to achieve without assistance. Like physical scaffolding, the supportive strategies are incrementally removed when they are no longer needed, and the teacher gradually shifts more responsibility over the learning process to the student.

Scaffolding is widely considered to be an essential element of effective teaching, and all teachers—to a greater or lesser extent—almost certainly use various forms of instructional scaffolding in their teaching. In addition, scaffolding is often used to bridge learning gaps—i.e., the difference between what students have learned and what they are expected to know and be able to do at a certain point in their education. For example, if students are not at the reading level required to understand a text being taught in a course, the teacher might use instructional scaffolding to incrementally improve their reading ability until they can read the required text independently and without assistance. One of the main goals of scaffolding is to reduce the negative emotions and self-perceptions that students may experience when they get frustrated, intimidated, or discouraged when attempting a difficult task without the assistance, direction, or understanding they need to complete it.

The following examples will serve to illustrate a few common scaffolding strategies:

- **The teacher gives students a simplified version of a lesson, assignment, or reading, and then gradually increases the complexity, difficulty, or sophistication over time.** To achieve the goals of a particular lesson, the teacher may break up the lesson into a series of mini-lessons that

progressively move students toward stronger understanding. For example, a challenging algebra problem may be broken up into several parts that are taught successively. Between each mini-lesson, the teacher checks to see if students have understood the concept, gives them time to practice the equations, and explains how the math skills they are learning will help them solve the more challenging problem (questioning students to check for understanding and giving them time to practice are two common scaffolding strategies). In some cases, the term *guided practice* may be used to describe this general technique.

- **The teacher describes or illustrates a concept, problem, or process in multiple ways to ensure understanding.** A teacher may orally describe a concept to students, use a slideshow with visual aids such as images and graphics to further explain the idea, ask several students to illustrate the concept on the blackboard, and then provide the students with a reading and writing task that asks them articulate the concept in their own words. This strategy addresses the multiple ways in which students learn—e.g., visually, orally, kinesthetically, etc.—and increases the likelihood that students will understand the concept being taught.
- **Students are given an exemplar or model of an assignment they will be asked to complete.** The teacher describes the exemplar assignment's features and why the specific elements represent high-quality work. The model provides students with a concrete example of the learning goals they are expected to achieve or the product they are expected to produce. Similarly, a teacher may also model a process—for example, a multistep science experiment—so that students can see how it is done before they are asked to do it themselves (teachers may also ask a student to model a process for her classmates).
- **Students are given a vocabulary lesson before they read a difficult text.** The teacher reviews the words most likely to give students trouble, using metaphors, analogies, word-image associations, and other strategies to help students understand the meaning of the most difficult words they will encounter in the text. When the students then read the assignment, they will have greater confidence in their reading ability, be more interested in the content, and be more likely to comprehend and remember what they have read.
- **The teacher clearly describes the purpose of a learning activity, the directions students need to follow, and the learning goals they are**

**expected to achieve.** The teacher may give students a handout with step-by-step instructions they should follow, or provide the scoring guide or rubric that will be used to evaluate and grade their work. When students know the reason why they are being asked to complete an assignment, and what they will specifically be graded on, they are more likely to understand its importance and be motivated to achieve the learning goals of the assignment. Similarly, if students clearly understand the process they need to follow, they are less likely to experience frustration or give up because they haven't fully understood what they are expected to do.

- **The teacher explicitly describes how the new lesson builds on the knowledge and skills students were taught in a previous lesson.** By connecting a new lesson to a lesson the students previously completed, the teacher shows students how the concepts and skills they already learned will help them with the new assignment or project (teachers may describe this general strategy as “building on prior knowledge” or “connecting to prior knowledge”). Similarly, the teacher may also make explicit connections between the lesson and the personal interests and experiences of the students as a way to increase understanding or engagement in the learning process. For example, a history teacher may reference a field trip to a museum during which students learned about a particular artifact related to the lesson at hand.