Lesson Planning, Part II: Instructional Methods
Chapter Six

I.   Grouping Strategies
II. Whole Group Methods
III. Small Group Permutations
IV. Self-Directed Independent Work
V.   Colleagues in Class – Effectively Managing Assistants and Aides

Introduction

In the last chapter, we focused on the overall structure of a lesson plan. In this chapter, we are going to zoom into the "heart of the lesson"—the Introduction of New Material, Guided Practice, and Independent Practice—to discuss some of the particular strategies you might choose to employ.

Needless to say, this chapter can't cover the hundreds and hundreds of instructional methods that a teacher might use. We have chosen to focus on a handful of the strategies that teachers most often use and find particularly effective: grouping strategies, demonstrations, lectures, questioning and discussion techniques, discovery learning, cooperative learning, independent work, inquiry and problem solving, and graphic organizers. We have also used this chapter to address a potential factor when considering how to deliver instruction: classroom assistants.

We will save the question of how you decide *which* instructional method to use (by weighing factors such as student needs and interests, the objective's cognitive level, the nature of the content, and time and resources available) for the next chapter. This chapter familiarizes you with *how* each method works.

With some over-simplification, we can separate the instructional choices you make when planning each lesson into two general categories based on:

(1) How the students are organized to engage the material
(2) How the teacher delivers the material

These two sets of variables work together to provide multiple instructional options. Consider the following table:

Student Grouping (to name a few)		Instructional Delivery Methods (to name a few)
Whole Class	X	**Teacher Modeling/Demonstration**
		Lecture
		Graphic Organizers
		Questioning and Discussion
		Discovery Learning
Small Group • Heterogeneous by skill level • Homogeneous by skill level • Interest groups • Pairs or informal groups		**Cooperative Learning** **Inquiry / Problem Solving**
Individual		**Centers**
		Independent Projects

Instructional Methods

It is possible to mix and match these grouping strategies and instructional delivery methods. You might decide to put your students in a small group for a discussion, or conduct a whole class problem solving activity. It is for that reason that we will begin by giving a quick overview of each grouping strategy's main features, so you can see both the versatility and the unique usefulness of each organizational technique. Then, to give you the best sense of how the instructional delivery methods work, we will describe each one in the context of its most popular grouping configuration (whole class lecture, for example).

I. Grouping Strategies

As part of determining the best way to deliver instruction that meets the needs of all students, you will need to decide how you will group your students throughout your lesson. Effective student learning can take place in a whole group setting, in small groups, or individually—each with or without direct teacher interaction. As you are planning, you should consider what types of grouping to use at each stage of a lesson. Most lessons will include a mix of group formats.

The following tables describe the three most common grouping strategies (whole class, small groups, and individual) and give examples, tips, and pitfalls for each.

Whole Class Grouping

Description	The teacher works with the entire class.	
When or why would I use this strategy?	• To present new information or review information with the entire class efficiently. • To gain an overall sense of what skills and knowledge students are bringing to a particular lesson objective.	• To summarize or introduce a learning experience. • To incorporate the diverse perspectives of the entire class. • To facilitate a teacher-led demonstration. • To be able to quickly check for understanding across the whole class.
Examples	• Lecture presenting new material. • Lesson Opening or Closing.	• Questioning and whole group discussion. • Demonstration or modeling.
Useful Tips and Common Pitfalls	• Whole group instruction may be the easiest grouping strategy to manage, because the teacher is often in control and students are accustomed to the expectations of a teacher-led experience. At the same time, it is much more difficult to individualize instruction and address varied student needs in this format. • Students may initially be wary of sharing answers in front of the whole group, especially in discussions where there is no right or wrong answer. A classroom culture that establishes a safe environment helps alleviate this fear. • Also be aware not to let one or two vocal students dominate your attention.	• Students can get bored or off-task because they can more easily disengage in a large group setting. You need to ensure in your planning that it is clear at each moment what students are supposed to be doing. Are they supposed to be taking notes with the help of a graphic organizer? How much time have you reserved for questioning? • English language learners or students with learning disabilities may need additional explanation or time with you to grasp material presented to the whole group in lecture form. You might want to set up conferences with such students, or assign them a buddy who can share their notes to fill in gaps.

Small Groups

Description	The teacher works with one small group of students. The rest of the class may be working either individually or in other small groups.	
When or why would I use this strategy?	• To work closely with a small group of students on particular skills. • To address different academic levels within the class. • To address varied student interests.	• To enable student collaboration to achieve a common learning objective. • To expose students to a variety of perspectives.
Examples	• Cooperative groups, partner work	
Useful Tips and Common Pitfalls	• Effective cooperative learning requires much more than placing students in groups and encouraging collaboration. Students must be **taught** how to work effectively with peers - listening to each other, monitoring each other's behavior to ensure they remain on task, and maximizing each other's talents and contributions. Teaching, modeling, and planning for effective cooperative learning is the teacher's responsibility.	• When one small group is with the teacher, other students – whether they are working individually or in small groups – must have clear expectations for productive activities they can complete without teacher guidance. • Cooperative learning tends to take more time, and the potential for students to veer away from the specific learning objective is increased. • Small groups can make it more difficult for the teacher to ensure that each individual student has mastered the objective. That is, group output may actually reflect only one student's learning.

A "Group" of One: Independent Work

Description	All students work independently on an assignment, or the teacher works with one child while other students are working independently.	
When or why would I use this strategy?	• To work with a particular student on a learning objective specific to him or her – from an IEP or otherwise.	• To allow students to progress at their own pace on a class-wide learning objective. • To allow the teacher the opportunity to observe individual student progress.
Examples	• Independent journal writing. • Silent sustained reading (SSR) during which everyone, including the teacher, reads a book of his or her choice. • Individual student practice of various skills (math, science, etc.).	• The "workshop method" is an approach in which students complete assignments at their own pace and turn to the teacher for instruction, help, and feedback. Student and teacher agree on the pace ahead of time. The teacher then customizes instruction for each student. This method is used frequently in writing classes, where constant revision of long-term projects is often central to the curriculum.
Useful Tips and Common Pitfalls	• If all students are working independently, the work must not only contribute to a student's progress towards goals but also require minimal supervision. • In order for students to be successful in this model, they need to learn skills for how to behave and work effectively on their own. Very young children have short attention spans and are unlikely to be able to work individually for long periods of time without teacher guidance.	• Strategies for helping students work independently include: establishing a regular (and therefore predictable) routine; posting written directions for easy referral during an independent activity; appointing students to field questions while the teacher is holding meetings, or instructing students to write down questions to ask the teacher later; and maintaining a weekly list of enrichment or review activities for when a student is finished with independent work and the teacher is working with someone else.

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We will discuss the question of selecting the best grouping strategy in the next chapter, when we consider the needs and interests of students, the cognitive level of the objective, the nature of the content, and the time and resources available. As the instructional leader, you must ask yourself which grouping strategy will enable each student to move forward most quickly toward your objective.

Now that you know the various grouping combinations, we will move on to detail the most common instructional delivery options under each configuration.

II. Whole Group Methods

Modeling / Demonstration

Demonstration is one of the most common instructional methods across the grade levels. Kindergarten teachers model how to form letters of the alphabet. Chemistry teachers show students how to balance equations. If the objective is: "Students will be able to dissect a frog," the teacher should bust out the scalpel and a specimen and perform a sample incision. Similarly, if students are expected to know how to pick out library books independently, the teacher will want to outline the key steps for doing so, take the class to the library, and model those key steps. It goes without saying that demonstrations must be planned and executed well if students are to learn the skill they are expected to master.

For demonstrations, teachers should:

- **Direct student attention to fundamental elements of proper procedure** through (a) holding up an object or pointing to where you want students to focus, (b) breaking processes into clear and numbered steps, (c) performing each action with narration ("now I am checking to make sure I am using the metric side of my ruler"), and exaggerated motions, if applicable

- **Prepare visual or tactile aids** for students to see or experience your demonstration clearly

- **Explain new concepts or terms** ahead of time, or else students will not be able to follow your demonstration

- **Highlight common errors** for students to avoid

- **Narrate your behaviors** by explaining to students what you are doing and thinking at every step of your demonstration

For example, one fourth-grade class goes to the library every week to select new silent reading books. In a lesson on making good literary choices, the teacher points out that some students make the mistake of literally judging new books by their covers and fail to skim the text before checking them out from the library, realizing too late that the books are inappropriate or uninteresting. She explains four steps to avoid this problem: looking at the Student Book Reviews binder for recommendations; considering other books by a favorite author; doing a search of favorite topics in the card catalog; and reading one page of a potential choice and making sure there aren't more than five unfamiliar words. As the students write down the steps, she goes through this process herself. After this Introduction to New Material, Guided Practice and Independent Practice can follow, with students gradually taking over the demonstration of the skill.

Lecture
If a demonstration covers skills, teachers will often use a **lecture** to reach knowledge-based objectives. Perhaps the most traditional form of instruction, lectures conjure up the image of a stodgy professor droning on and on while his students doodle or even sleep to escape the monotony.

However, lecture is often the most efficient way to present or review material with the entire class. Teachers choose to lecture when they have a limited amount of time, when the background information is not available or easily accessible to students (e.g., the material is not in print), or when the concepts could be best clarified through verbal explanation. Of course, lecture works best for older students, as younger students may not be able to absorb information for long periods of time.

There are some drawbacks to using lectures as an instructional tool; namely most "lectures" – as they are most commonly delivered – do not allow frequent interaction between students and the teacher. This disadvantage can be overcome, however, by leaving time at the end for whole-class discussion.

If you determine that a lecture is the most efficient and effective instructional tool, here are some guidelines to delivering the information:[22]

- **Determine the style of your lecture,** whether it's a...

  - Classical lecture, which works well when you simply want to transmit information;

  - Problem-centered lecture, where you offer solutions to a problem with advantages and disadvantages;

  - Sequential lecture, where you promote understanding of a subject by giving an extended argument or chain of reasoning that leads to a conclusion;

  - Comparative lecture, where you draw comparisons between new and familiar information; or

  - Thesis lecture, where you make and justify an argument or assertion.

I always thought that lecturing was most useful when I was constantly assessing along the way and involving students as much as possible instead of just blabbing. You have to find ways to make sure they're with you during a lecture—something more than just "Great! They are all looking at me! They get it!" You've got to incorporate questions, encourage students to think about what you're saying and to predict where you might be headed. Stop to have students share a thought with their neighbor about what they just heard, or ask students to summarize the lecture or bring up points that are confusing. There are many ways you can engage students in your lecture, but it takes some planning up front.

Jessica Kaufman, Houston '99
Associate, Morrison and Foerster

- **Focus on reaching clear outcomes.** What are your objectives? Write down and tell the students what you what them to walk away with.

- **Organize the lecture for your students.** Make it easier to take notes by providing students with graphic organizers (more on this later in the chapter) or outlines at the beginning of your lecture. You can also put a brief outline of the lecture on the blackboard or overhead transparency.

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[22] Some of this information has been modified from *Lecturing with Style*, Walker Teaching Resource Center, The University of Tennessee at Chattanooga. http://www.utc.edu accessed 7/1/2010.

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- **Establish ground rules.** Are questions in the middle okay, or should students wait until the end? If you don't want students to interrupt you, you need to teach them to write down their questions so you can address them at the end of the lecture.

- **Make modifications for visual learners.** Synchronize slides (or overheads) to go with your verbal presentation. Select graphics that represent the ideas, concepts or words.

- **Follow the basic strategies for effective oral presentations:**

  o Use *visual cues*, such as props, slides, handouts, keywords on the board, diagrams, or pictures.

  o Use *vocal cues,* such as adjusting the volume of your voice and taking advantage of pauses.

  o Use *signal phrases*, like noting that you will be talking about *six* techniques for writing a great essay opening, which will help them anticipate what you will be saying.

    o Tap into the *drama, intrigue and relevance* of your subject by telling a human-impact story, sharing a personal anecdote, or citing local examples.

    o Use *body language*, such as gesticulating wildly when talking about a tornado, or crouching down when talking about predators and prey.

    o Avoid *vagueness* or *indecisive, halting speech*, such as "This chemistry lesson *might* help you understand *a little bit more* about *what is often called* a physical change*, no,* a physical reaction…*well*, both terms could *actually* work *in this instance*. *Maybe* before we get to what is *perhaps* the main point of the lesson…"

    o Be aware of your *non-verbal behavior*, such as fidgeting and pacing, which can be distracting.

    o Make *eye contact* and be *enthusiastic*, sharing why this subject interests you.

  - **End your lecture clearly.** Summarize and highlight the main points. Conclude with the key ideas and how they relate to the future. What should students do with the information from today? Then invite questions and ask questions of students.

Graphic Organizers

A flow chart, a time line, a family tree – these are all graphic organizers, which combine words and phrases with symbols to visually represent connections between various pieces of information or ideas, thereby helping students to process information. These tools can come in handy during the Introduction of New Material, when you can refer to a completed graphic organizer to help students visualize the connections among the concepts they are learning. During Guided or Independent Practice, students can complete or create their own graphic organizers to apply the

Graphic organizers are so effective in my classroom. Not only do they keep my students organized, but they also keep my lessons organized and well-paced. They teach discipline in note-taking and keep students on task during a lesson. I use graphic organizers for taking notes in my English class – it's wonderful because it keeps my students' attention and they produce something they can refer to later.
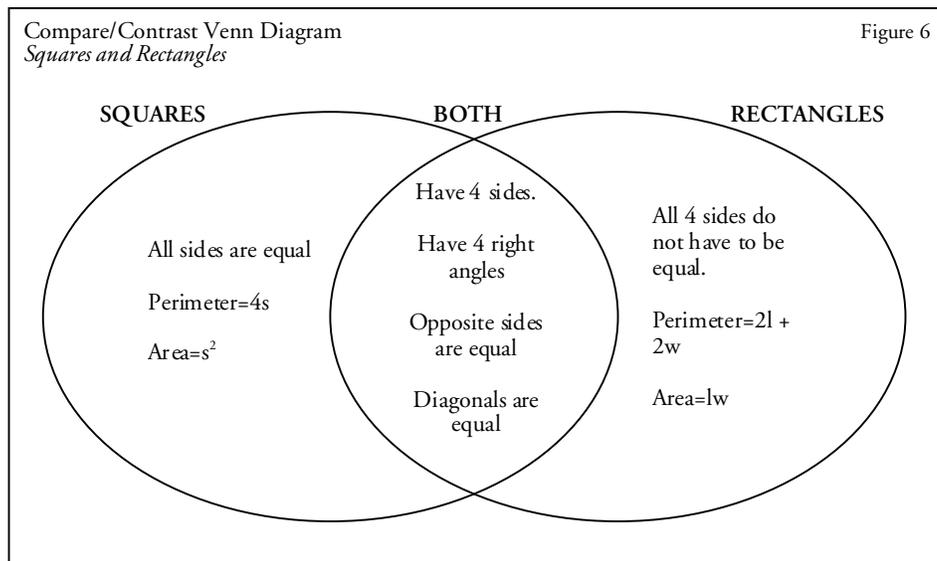
Abigail Rossetti, Las Vegas '04
Senior Managing Director - Chicago Institute
Teach For America

information they have learned. Graphic organizers are also an excellent way to reflect on and organize learning at the end of a lesson or unit; they are among the most versatile learning devices because they can be used in whole group, small group and individual configurations.

These tools can be especially helpful as a way for students to learn how to take notes, a skill you cannot assume students possess at the beginning of your year. You may have to show students how to separate main ideas from details, or how to abbreviate effectively. Lay out exactly how you expect students to take notes (even modeling the process with a clip of the evening news, for example), provide tips on outlining, and have students practice. Doing so will lead to more retention of the information you relay in lecture.

Below is an example of a **Venn diagram**, a commonly used graphic organizer. This particular tool allows students to compare and contrast two objects or ideas. A filled-in version of this diagram could be given to students at the beginning of a lesson, students could fill it in as the lesson progresses, or students could fill it in as a form of student practice. Asking students to identify similarities and differences between concepts is the instructional strategy with the high probability of improving student achievement, according to a recent analysis by the McREL educational laboratory. [23]

A **web** – where key concepts literally sprout from a central topic, and details branch off from each concept – serves yet a different purpose: brainstorming new ideas. Be sure to look at the other graphic organizers in the **Instructional Planning & Delivery Toolkit** (pp. 64-67), which can be found online at the Resource Exchange on TFANet. ✄ Show these different kinds of graphic organizers to your class and explain their purposes. Then have students practice selecting the appropriate choice for a particular task.

Compare/Contrast Venn Diagram   Figure 6
Squares and Rectangles

SQUARES   **BOTH**   **RECTANGLES**

All sides are equal

Perimeter=4s

Area=s^2

Have 4 sides.

Have 4 right angles

Opposite sides are equal

Diagonals are equal

All 4 sides do not have to be equal.

Perimeter=2l + 2w

Area=lw

For other ways to encourage the retention of material in your class, see the sections on "Analogies", "Brainstorming", and "KWL Charts" in the online **Instructional Planning & Delivery Toolkit** (pp. 68-70). ✄

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[23] Marzano, Robert. *Classroom Instruction that Works*. Alexandria, VA: ASCD, 2001, 22-25.

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Questions and Discussion— A Fundamental Instructional Tool
Reflect for a moment on the questions you ask and are asked on a daily basis. "What time do we have to be at the bus tomorrow morning?" "Where can I get some information and tips about grant writing?" "Why is it important to create a long term plan?" "Which student has posed the greatest challenge for you, and how are you going to move that student to achieve academic gains?" These questions can be categorized according to two purposes for asking a question:

a) **Questions are asked to gain information.**
   - "What time do we have to be at the bus tomorrow morning?"
   - "Where can I get some information and tips about grant writing?"

b) **Questions are asked to stimulate thought.**
   - "Why is it important to create a long term plan?"
   - "Which student has posed the greatest challenge for you, and how are you going to move that student to achieve academic gains?"

As a teacher, you will often ask questions to gain information – information about what students do and do not yet understand. Questioning is a specific method of assessment that can be used every day to measure student understanding and gauge the effectiveness of your lesson.

Questions should also be asked to stimulate student thought. This type of questioning is a fundamental and powerful instructional tool. Don't think that using questions to lead students to deep understanding is reserved for stodgy law professors and long-dead philosophers; questions and discussions are instructional methods that can be used at all ages and in all content areas.

In his extensive survey of pedagogical research, Jere Brophy found that questions-based discourse was one of the most common and most powerful tools for introducing new material and checking for students' understanding:

> Besides presenting information and modeling skills application, effective teachers structure a great deal of content-based discourse. They use questions to stimulate students to process and reflect on content, recognize relationships among (and implications of) its key ideas, think critically about content, and use it in problem solving, decision-making, or other higher-order applications. Such discourse should not be limited to factual review or recitation (featuring rapid pacing and short answers to miscellaneous questions), but instead should feature sustained and thoughtful development of key ideas.[24]

Brophy goes on to describe how this technique often plays out in successful classrooms:

> Thoughtful discourse features sustained examination of a small number of related topics, in which students are invited to develop explanations, make predictions, debate alternative approaches to problems, or otherwise consider the content's implications or applications. The teacher presses students to clarify or justify their assertions, rather than accepting them indiscriminately. In addition to providing feedback, the teacher encourages students to explain or elaborate on their answers or to comment on classmates' answers. Frequently, discourse that begins in a question-and-answer

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[24] Brophy, Jere. "Generic Aspects of Effective Teaching." *Tomorrow's Teachers*, ed. Margaret C. Wang and Herbert J. Walburg. Richmond, CA: McCutchen Publishing Corporation, 2001, p. 25.

format evolves into an exchange of view in which students respond to one another as well as to the teacher and react to statements as well as questions.[25]

You will undoubtedly find yourself using question-based discourse extensively in the classroom. In many ways, it is the most natural method of engaging students in new material. However, while all of us have been asking and exchanging questions all of our lives, effective questioning in class is not easy. Asking truly effective questions is a complex skill. By developing effective questioning techniques, you will develop your ability to engage students in meaningful discussion and to gather accurate information about student understanding and achievement of learning objectives.

Choosing the Type of Question(s) to Ask

There are numerous approaches to classifying questions; for our purposes we are going to use four categories: managerial, rhetorical, closed, and open. The following table defines each question type and provides examples.

Type	Examples	Question Function
Managerial	• "Who needs more time?" • "What is the first step of the lab?" • "What do we do when we get to the next center?"	To keep classroom operations moving toward a desired goal; to ensure students have understood procedures and behavior expectations.
Rhetorical	• "The letter 'A' is a vowel, right?" • "Yesterday we talked about the difference between a virus and bacteria; does everyone remember?"	To emphasize a point; to reinforce an idea or statement.
Closed	• "Who were the first three presidents?" • "What is the least common denominator of these fractions?" • "What is one way heat moves between objects?"	To check the retention of previously learned information; to focus thinking on a particular point.
Open	• "What would life be like if we were all the same color?" • "Given what we know about gravity on the moon, how do you think basketball would be different if played there?" • "Why do quadratic equations result in curves?"	To promote discussion or student interaction; to stimulate student thinking; to allow freedom to hypothesize, speculate, and share ideas.

The Danger of Excessive Rhetorical Questions

As each question type has a different function and elicits different responses, you should think about the questions you are going to ask before you teach the lesson. Managerial and rhetorical questions are always going to be present in lessons; managerial questions are necessary to keep the classroom running efficiently, and rhetorical questions allow you to emphasize a point without stopping to elicit student responses.

We strongly encourage you to watch out for your overuse of rhetorical questions. We have seen many beginner teachers substitute true checks for understanding with questions like, "Does everyone get it?" These do not yield accurate responses and are flimsy formative assessments. Students might nod and look as though they've "gotten it," but how can you be sure? Never assume that your students will stop a lesson and say, "I don't understand." You must actively use questioning techniques to make sure your students are actually progressing.

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[25] Ibid, p. 26.

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The Time for Closed Questions

Open and closed questions are also best used in certain circumstances. If the objective for your lesson involves lower order thinking skills, then closed questions, which touch upon the thinking skills of knowledge and comprehension in Bloom's Taxonomy, are appropriate. Consider the question, "Who were the first three presidents?" This question has a finite number of "right" answers and is convergent, meaning that it limits the amount of student thinking. Students retrieve these answers from their memory and the teacher quickly assesses accuracy. Once the "right" answer has been expressed, there is no other need for student input. Closed questions, therefore, are effective when assessing specific student knowledge or comprehension. Due to their specificity, closed questions are easier to integrate into lessons than open questions. Closed questions should be used to build students up to open questions later in the lesson or unit.

The Argument for Open Questions

Open questions demand more complex thinking and should be used in lessons that require students to use higher level thinking skills. As Brophy explains,

> The forms and cognitive levels of questions should be suited to instructional goals. Some primarily closed-ended and factual questions might be appropriate when teachers are assessing prior knowledge or reviewing new learning, but accomplishing the most significant instructional goals requires open-ended questions that call for students to apply, analyze, synthesize, or evaluate what they are learning. Some questions will have a range of possible correct answers, and some will invite discussion or debate (e.g., concerning the relative merits of alternative suggestions for solving problems).[26]

When I first ask a question, I try to leave it as open-ended as possible. For example, instead of "What do we divide by to solve for x in this equation?", I would say, "How do you isolate the unknown in this equation?" If a student remains stuck (after adequate wait time – I'm still working on counting to 15 in my head before saying anything!), I would then add more detail to help. I never give up on a student and let someone else answer the question. I just keep moving back until I find common knowledge that I can use to help the student develop his/her own answer.

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Principal, KKR Capstone

Consider the following question, "Who was the most effective of the first three presidents and why?" To answer this question, students need to have been given more information than just the names of the presidents, as they are being asked to evaluate each of the first three presidents on some criteria that determines "effectiveness." This question is "divergent." The classroom dialogue could include any number of criteria and still address the original question. Since there is not a set "right" answer, students can challenge the validity of their classmates' responses.

In sharp contrast to closed questions, open questions are most effective at stimulating student thought and encouraging classroom participation (which is not to say that closed questions do not have their place). You should make a concerted effort to include open questions during instruction, as they promote the type of thinking that encourages high academic achievement. You should note, however, that open questions should be carefully crafted so that they do not lead to confusion or tangential discussions. You should also anticipate the fact that open questions take longer to discuss, and keep that in consideration when developing your lesson plan.

Given the close alignment between effective questioning techniques and the cognitive level of your objective for your students, be sure to take some time to review "Bloom's Taxonomy" and "How to Write

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[26] Ibid.

Higher and Lower Order Questions" in the **Instructional Planning & Delivery Toolkit** (pp. 71-72), which can be found online at the Resource Exchange on TFANet. ✴

Asking Questions Effectively

Knowing what questions to ask is only half the battle. You will also need to carefully consider how you ask the questions. You'll want to be sure you are giving your students enough time to process the question and that you're challenging *all* of your students to think.

A key piece of this process is the questioning cycle, which encourages student participation and thinking. This cycle depends upon what we call "wait time," which is the time between asking a question and selecting a student to answer. This practice reserves time for student thinking, enhancing the quality of student response and increasing the number of students who are likely to engage in considering a response. In order to ensure adequate wait-time, many teachers actually count to five silently before they ask for a response.

a) The Questioning Cycle

| Teacher Question | **Pause (wait time)** | Student Response | **Pause (wait time)** | Teacher Reaction |
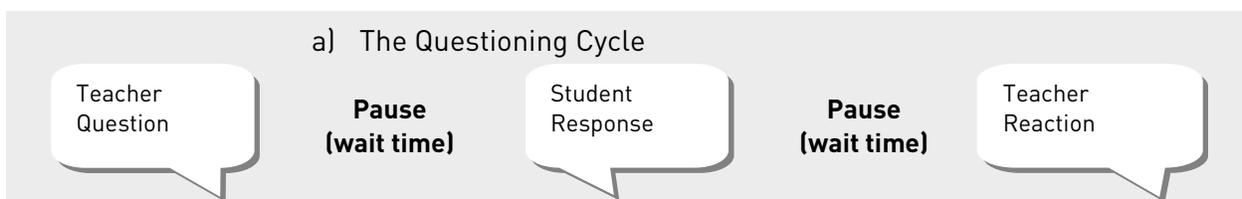
Academic research supports the notion of "wait time," and warns that many teachers neglect to provide students an opportunity to think about their answers, thereby missing a key learning opportunity:

After posing a question, teachers need to pause to allow students time to process the question and at least begin to formulate their responses, especially if the question is complicated or demands a high cognitive level of response. Research by many different investigators has shown that teachers often undercut the potential pedagogical value of their questions by calling on students to respond too quickly (often pausing less than a second after completing the question).[27]

> *For many of my questions, I would have students write their answer in their journals. I gave them all a minute to think about it and write before calling on anyone. This made it so everyone was prepared with an answer if I called on them and it avoided the annoying "I don't know" response. I also made sure to call on a few students before discussing the merits of each answer. This way, students did not shut down if they wrote down something different from the right answer and it got a range of thinking on the table.*
>
> **Greg Wong, Delta '99**
> **Attorney, K&L Gates**

The next step is to ask questions that encourage all students, rather than one or two individuals, to think and engage in the material. One simple but highly effective strategy for accomplishing this is to place the student's name at the end of the question, rather than the beginning, ensuring that the rest of the students don't tune out as soon as they realize they are not going to be called on.

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[27] Ibid, p. 8.

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Your Aim	Example	Explanation
Encouraging ALL students to think	"What is the difference between nouns and verbs …(wait time) … Samuel?"	When you ask the question in this way, most students will think of the answer in anticipation of your calling on them. When they hear Samuel's response, they may want to expand upon or challenge his answer as they have already formulated their own.
Encouraging ONE student to think	"Samuel, what is the difference between nouns and verbs…(wait time)?"	When you ask the question in this way, Samuel is the only person who is prompted to truly prepare to give the answer. Most other students will tune out and wait to hear Samuel's response rather than think of their own answer.

There may be occasions when students are shy to answer your questions, fearful of their abilities to give correct answers. Give these children ample time to respond, and consider helping them answer a more complex question (why Chicago became a major transportation hub) by starting on lower levels of Bloom's Taxonomy (where Chicago is located, how goods travel) and then working up.

On the other hand, you may find that some students respond more to questions than others. A common factor that leads to this uneven response is the amount of eye contact that a teacher makes with different parts of the room. Students who are on the outskirts of a teacher's zone of vision tend to receive fewer verbal and non-verbal cues, making them less likely to volunteer for questions and less likely to be noticed when they do raise their hands. To ensure that the same students are not always responding orally, you may want to implement a system of random selection of students, rather than relying on volunteers. Here is a quick list of closely related methods to ensure equitable student selection:

1. **Note cards.** Write each student's name on an individual 3x5 index card. Compile all the cards in one stack. When selecting students read the name on top of the stack then turn to the next card.

2. **Seating Chart.** Have a clipboard with the classroom seating chart. Each time you ask a question, make a mark next to the name of the student whom you asked. Check to see if each student has been asked a question before you ask a second.

3. **Popsicle sticks.** Write each student's name on a tongue depressor or Popsicle stick. Place all of the depressors in a jar. When you are ready to select a student, randomly pull one depressor.

You should also consider whether there are demographic trends among who is called upon to answer questions. It is helpful to have an observer track your questioning habits. With collected data you can determine if you are questioning students differently based upon gender, race, behavior, classroom location, or any other factor. Again, the random methods above can help ensure fairness.

> *To ensure that all students participated in my lessons, I would have everyone write down the answers to my questions before I called on someone, and I could scan these answers as I was moving about the room.*
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> **Allison Rogovin, Houston '95**
> **Managing Director, Recruitment**
> **Teach For America**

Additionally, you will want to **establish procedures** for answering questions ahead of time. Without consistently enforcing rules like "only raised hands get called on" or establishing a policy where teachers call on students at random, students will simply shout out, eliminating your control of whose understanding you wish to assess at a given moment.

The final step in asking questions effectively is determining how best to respond to students' answers. Sometimes it is appropriate to respond to the student directly, either affirming their answer or gently pointing out the problem with their response. Researcher and author Kenneth Chuska offers a series of ways to ask effective, higher-order follow-up questions, depending on a student's response[28]:

- **Clarify student responses.** Often, students will offer answers without fully explaining how they arrived at their response. Enable students to be conscious of the importance of precision and the nuance of language and meaning with questions like, "What do you mean by that? How are you defining that term? What might be another way we could use to describe that?"

- **Ask for validation and evidence.** When students supply a faulty conclusion, instead of correcting them, try asking questions like, "Where did you get that information?" or "What support do you have for that?" to guide students to their own understanding. This line of questioning is also appropriate for students who have provided correct answers but have not detailed how they got there.

- **Seek to broaden opinions.** If students offer their own views on an issue, guide them to see their own particular vantage point by asking, "What or who led you to feel or believe that?" You can then ask them to consider points of view by asking a question such as, "Who might disagree with you about this, and why?" or "Here are some objections I have heard to that opinion. How would you respond to these?"

- **Encourage thinking about the implications of a student's views and conclusions.** After proving their points with data, students can still think about the meaning of their conclusion. Ask "What do you predict will happen as a result of your conclusion? What are the consequences if your conclusion is valid?"

- **Dig underneath a student's judgment.** When students make evaluative remarks about a subject (e.g., a piece of literature, a historical figure), complicate their thinking by to them. "What criteria did you use in making your judgment?" "Here are some other criteria. Would they affect your evaluation? How?"

Be aware, though, if questions in the classroom constantly resemble verbal "ping pong" between a student and the teacher—which happens when teachers respond directly to one student and then ask an entirely new question of another student. Students will not look to each other as sources of information nor will they be inclined to engage in dialogue with one another. According to research by Wilen and White, this "ping pong" method is more likely to be found in low-socioeconomic-status classrooms and in classrooms where teachers perceive their students as low achievers. Additionally, ethnographers found that students from certain cultures have difficulty responding within this pattern.[29] Highly effective teachers eventually "phase out" their own involvement in a discussion completely, teaching students how to take turns and respond thoughtfully to one another. In these classrooms, over time, it is the students who are asking for clarification, validation, and elaboration of their peers' ideas.

It is also important for the teacher to avoid being the sole "judge" of correct and incorrect answers.
It can be effective to diplomatically involve the class in careful consideration of the students' answer by asking a follow up question of other students, so they build on their classmate's response, as in "Natalia, how would you respond to April's question?"

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[28] Chuska, Kenneth. *Improving Classroom Questions*. Bloomington, IN: Phi Delta Kappan Ed. Foundation, 1995, pp. 60-65.
[29] Wilen, William. *Questioning Skills for Teachers*. Washington: National Education Association, 1991, p. 25.

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Planning Discussions

When asking questions, sometimes you are looking for a specific answer, and other times you will want to create arenas for students to benefit from each other's point of view. Creating classroom discussions can be tricky because students may be reluctant to contribute—or eager to pursue irrelevant tangents. Here are a few suggestions for making discussions productive:

- **Discuss familiar topics or matters of perspective or observation.** Students may be shy to participate in discussions at first because they believe they do not know the magic answer sought by the teacher. Encourage students to draw from their personal experiences and opinions when delving into a topic. For example, "What are some of the ways that commercials attempt to get you to buy products? What different techniques do they use to get your grandparents to buy things?"

- **Establish ground rules.** Once they get started, discussions can get heated or raucous. Be sure to explain your expectations for behavior—allowing one person to speak at a time, asking clarifying questions instead of pouncing on someone else's comment—before setting off a free-for-all. You may want to develop a system that requires everyone to get equal "air time."

- **Have an objective in mind – and stick to it.** Discussions have a tendency to drift, so be sure to take the reins and gently steer conversation back to the objective by highlighting the relevant points already made. For example, "Let's review...we were discussing the techniques that commercials use to persuade us...Margaret mentioned catchy jingles...what else?"

- **Foster well-informed dialogue.** Provide necessary background information so that your students are well-informed ahead of time. You may want to have students read a book or passage, or examine data before spouting off about a topic. In addition, have students jot down a few thoughts before beginning the conversation to allow ideas to surface and percolate, and ask clarifying questions if you do not understand what students are trying to say – or if they need to support their claims with evidence.

- **Meld personal, analytical and global perspectives in the discussion.** Because new knowledge builds on prior knowledge, students may be drawn into a dialogue by sharing their own views, or sharing information they know about a related subject. Rather than simply limiting a discussion about *The Adventures of Huckleberry Finn* to the text, ask students if they ever had to support a friend when everyone else thought he or she was wrong. Ask them, too, about the responsibilities of people who ran across runaway slaves in the nineteenth century.

- **Ask higher-order questions.** In general, it is unwise to "go fishing" during a discussion and hope that students will give the exact answer you are looking for. Use discussion to encourage divergent thinking by focusing on analysis, synthesis and evaluation. "Last month, we read a book written by O. Henry, and we have just finished one by Sir Arthur Conan Doyle. What can we learn from both authors about the art of writing suspense?"

You may find that certain students are less skilled at participating in discussions, and it is your job to create opportunities for everyone to get involved. Chuska's book, *Improving Classroom Questions*, recommends some strategies for working with reluctant students[30]:

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[30] Chuska, Kenneth. *Improving Classroom Questions*. Bloomington, IN: Phi Delta Kappan Ed. Foundation, 1995, p. 22.

Increasing Participation in Discussions

Reason for Reluctance	Potential Strategy
Fear of failure	Break down the question into smaller parts and have different students answer different pieces. Emphasize that students are in school to learn new things. "If you knew everything already," you might say, "I'd be out of a job!"
Fear of ridicule	Before you begin regular discussions in your classroom, conduct a series of lessons on how it feels to be put down. Develop a code of conduct to prevent insults, and enforce the code strictly. To foster a team spirit, communicate when students are doing an effective job of building on one another's ideas.
Looks of confusion	Be ready to phrase your question in several ways, or provide the questions ahead of time.
Speed of questioning	When in doubt, slow down. Allow more students to think about the idea before calling on any one person.
Disinterest or apathy	Ask students to share their own beliefs, feelings or experiences with the topic. Build in "gray area" questions that are bound to spark some disagreements to get the discussion moving.

Discovery Learning

Having a discussion is one way for students to reach their own conclusions about a subject. Another strategy that allows for students to develop understanding is called discovery learning. Typically, this method is geared towards higher-level objectives and is used in helping students induce or "discover" general ideas, concepts, or definitions from specific examples. During discovery learning lessons, teachers often provide students with a common experience by presenting them with materials and encouraging them to make observations, form hypotheses, test solutions, and induce concepts. This technique is often used, for example, in science classes where students learn concepts through the experience of conducting a lab or experiment.

One type of discovery learning, called "concept attainment," is when a teacher uses a series of examples and non-examples to help students understand defining characteristics of a concept. Author Anita Woolfolk provides an excellent re-creation of this specific strategy at work in a fifth-grade classroom. Let's put on your thinking caps and discover the mystery idea:

> The teacher began a lesson by saying that he had an idea in mind and wanted students to "figure out what it is." He placed two signs on a table—one said "Examples" and the other said "Non-examples." Then from a bag he removed an apple and placed it in front of the "Examples" sign. Next, he put a rock in front of the "Non-examples" sign.

> He asked his students, "What do you think the idea might be?" "Things we eat" was the first suggestion. The teacher wrote "HYPOTHESES" on the board and, after a brief discussion of the meaning of "hypotheses," listed things we eat under this heading. Next he asked for other hypotheses—"living things" and "things that grow on plants" came next.

> After some discussion of the differences between living things and things that grow on plants, the teacher brought out two more objects, a tomato for the "Examples" side and a carrot for the "Non-examples." Animated reconsideration of the hypotheses followed these additions and a new hypothesis—"red things"—was suggested. Throughout the discussion, the teacher asked students to explain their conclusions: "We eat carrots, but a carrot is *not* an example, so the idea can't be things we eat." The teacher added an

avocado as an example and celery as a non-example. Further examples (peach, squash, orange) and non-examples (lettuce, artichoke, potato) followed. The students eventually narrowed their hypothesis to "things with seeds in the parts you eat."

The students had "constructed" the concept of "fruit"—foods we eat with seeds in the edible parts (or, a more advanced definition, any engorged ovary, such as a pea pod, tomato, pineapple, or the edible part of the plant developed from a flower).[31]

Concept attainment allows students to "make meaning" themselves, rather than having them simply copy down a teacher's explanation. Of course, this strategy is less efficient than simply giving students a definition. Plus, you run the risk of confusing your students by failing to give them a proper sequence or spectrum of examples and non-examples. If your only exemplars of fruits were sweet, then a student might incorrectly leave the lesson thinking that a sweet potato is a fruit. To avoid these pitfalls and create effective discovery learning experiences, you need to proactively consider these unintended, negative consequences, along with your students' prerequisite knowledge and skills, when planning. Throughout the lesson, you must also provide feedback to students that will focus their attention and lead them toward achieving the objective. At the end of the lesson, confirm the concept or principle that was intended to be discovered while providing further examples or explanation. While it can be more challenging to create, when discovery learning is designed carefully, it provides a much more organic learning process and, according to some teachers, increases the likelihood that students will retain the content.

III. Small Group Permutations

Whole group strategies are great to use when presenting information to the entire class, but to ensure more student interaction and address more student needs, you may need to split up your students into smaller groups. There are countless ways to do this. You can create the groups based on a variety of factors, such as skill level or student interest. You can also vary the group's purpose – to create a final product together, to edit each other's work, to brainstorm and share ideas, or to solve a complex problem. As with any choice of grouping strategy, before you implement a particular small group approach, you should be sure that it is the most effective way to get each of your students to master the learning objective.

Perhaps the most fundamental decision in creating small groups will be whether the group is heterogeneous or homogeneous with regard to performance level. The question of heterogeneous versus homogeneous grouping is sharply contested in the education community.

Proponents of Heterogeneous Grouping argue that such grouping can benefit both the more and less advanced students. More advanced students who have grasped the material must rise to the challenge of articulating the rationale behind their results (as we all know, it is one thing to know something and quite another to teach it to

Challenges of Small Group Instruction
Small groups can be an excellent way to reach learning objectives; however, they can also be very challenging to implement because there are so many important social skills necessary to work effectively in a group. First, students often need to be taught how to work with peers – how to listen and speak to each other (and even the volume with which to do so), how to monitor each other's behavior to ensure they remain on task, and how to maximize each other's skills and ideas. Second, it is difficult to ensure individual student mastery when students are working together. Make sure you have an assessment for every individual at the end of a group activity to ensure that meeting objectives is a primary result of group work.

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[31] Woolfolk, Anita. *Educational Psychology.* Boston: Allyn and Bacon, 1998.

someone else). For less advanced students, working with peers who have already developed a stronger understanding of the concept at hand can provide opportunities to see how this new skill can be applied. Proponents of heterogeneous groups often argue that homogeneous groups further hold back students who are having trouble, and widen the disparity between students. It is true that students who are experiencing difficulty with particular subject areas or with school in general tend to be tracked into groups for which teachers have lower expectations, thus compromising the students' learning opportunities. Moreover, once tracked into a particular level, students are often not given the opportunity to move to a more advanced group.

Proponents of Homogeneous Grouping counter that heterogeneous grouping creates an education program that unfairly holds back students who could be performing at a more advanced level and discourages lower-performing students from participating. In addition, they point out that it is often easier and more efficient to teach a group of students who are generally at the same level—whatever that level may be—than it is to meet the needs of a group where students' skills vary widely.

Students have to be taught to work cooperatively. Even with my high school students, we have to practice the procedures and systems we use to work in groups. It takes a lot of work to develop smooth-running small groups in which ALL students are mastering the objectives.

Stephen Ready, RGV '92
Bilingual Resource Teacher,
Sequoia Union HS District

Given these issues, educators have aimed to develop methods of teaching in homogeneous ability groups that do not have the impact of permanent tracking. Recent research suggests, for example, that homogeneous grouping is effective for beginning readers if the teacher continuously re-assesses all individual student progress and adjusts the groups accordingly. In this way, all students can progress at the fastest rate possible, and no students are permanently tracked.

The following charts describe a few common small group structures, provide guidelines for when and why to use a particular structure, give specific examples, and offer useful tips and common pitfalls to keep in mind when implementing small groups in your classroom. These tables cover (1) heterogeneous grouping by skills level, (2) homogeneous grouping by skill level, (3) interest groups, and (4) pairs/informal groups.

Regardless of the small group strategy you choose to implement, it is important that you clearly articulate the expectations of any small group interaction; students should understand why they are working together, how they will work together, and what they need to produce in the end. Before beginning group work, some teachers have students complete a form together, explaining how they will divide responsibilities and how they will ensure teamwork. Teachers also practice how to get the attention of the class for further instructions (either through some visual or auditory cue), as well as the ways in which group members are expected to speak to one another. At the end of the activity, students may fill out an evaluation form, rating the group's productivity and brainstorming ways to be more efficient next time. For an example form on rules and evaluating teamwork, see the **Instructional Planning & Delivery Toolkit** (p. 73: "Guidelines for Group Work"); this Toolkit can be found online at the Resource Exchange on TFANet. �

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Heterogeneous by Skill Level

Description	3-6 students who represent a range of skill levels (determined by diagnostic/pre-assessment) are temporarily grouped together.	
When or why would I use this strategy?	• This group structure is helpful when you have one skill/concept that all students need to master in the same way.	• Sometimes you simply will not have enough materials for all students to work individually.
Examples	• During a unit on cells, one of your objectives is that students will be able to identify various human cells by their shape and analyze how the shape of the cell relates to its function. You have 30 students and your school has only 10 microscopes. You group each student into a low, middle, and high tier based on skill, and form groups of three by taking one student from each tier. You set up 10 stations (with a different cell slide at each) and have each group circulate around the room. The groups have one answer sheet on which they must draw a picture of the cells they observe, identify the type of cell, and relate the shape of the cell to its function. Students must rotate their roles at each station (i.e. one student will be in charge of drawing the cell, another must facilitate the discussion of what type of cell it is, and the other must lead the discussion and write down how the shape of the cell relates to its function). You circulate through the room as well, ensuring each student fulfills her role, and that the entire group is collaborating to complete the group answer sheet.	
Useful Tips and Common Pitfalls	• You should establish roles for all group members and perhaps even assign roles to students based on their strengths or the skills they need to improve. This will also prevent lower-performing students from being discouraged from participating and higher-performing students from doing all the work.	• While you may want to have a group grade that reflects the quality of work produced by the entire group, it is also important to assess individual student growth.

Homogeneous by Skill Level

Description	3-6 students of similar skill levels (determined by diagnostic/pre-assessment) are temporarily grouped together.	
When or why would I use this strategy?	• This group structure allows students to be challenged at their current levels of understanding with regard to a particular learning objective.	• When groups are homogeneous by skill level, the teacher can easily focus instruction for each group.
Examples	• After diagnosing the math skills of your second graders, you group them by skill for a one-week unit on patterns. All groups will be exploring numerical patterns among whole numbers. You have extension activities in place involving patterns among fractions for students who you anticipate will grasp that material quickly.	
Useful Tips and Common Pitfalls	• Groups that are homogeneous by skill level are commonly used in reading groups, as students can work to read books at the same grade level or develop language and literacy skills. • This model can also work well with math skills.	• It is *very* important to frequently re-assess students and then re-adjust groups accordingly between sets of objectives or skills. Otherwise, students become "tracked," thereby losing motivation or suffering from low expectations.

Interest Groups

Description	3-6 students are grouped for a short time (one class period to several days) based on interest or learning style (determined by survey or student/teacher discussion). Interest groups will generally be heterogeneous.	
When or why would I use this strategy?	• To motivate students by recognizing and involving their interests and learning styles in classroom activities.	• To use the talents and skills of each student to enhance the learning experience of other students.
Examples	• You provide students with a list of books and short descriptions of the books' plots at the beginning of a unit on science fiction. Students are allowed to choose the book that they would like to read, and you arrange them in groups of 3-6, depending on their choice. Students work in these "book groups" during class to discuss what they read the night before and to complete a group project on the book.	
Useful Tips and Common Pitfalls	• In order to ensure that you are aligning their interests with the activity, you should survey students and allow them to express their interests. • You should establish roles for all group members and perhaps even assign roles to students based on their strengths or on the skills that you would like them to improve.	• Without clear expectations and definitions of student roles, students with stronger skills may end up doing the bulk of the work. • While you may want to have a group grade that reflects the quality of work produced by the entire group, it will also be necessary to assess individual student growth.

Pairs or Informal Groups

Description	Two students are grouped for a short time (a few minutes to one class period) in order to discuss and share their answers to specific questions, or 3-4 students are grouped for a short time to brainstorm, answer open-ended questions, or solve complex problems.	
When or why would I use this strategy?	• Students have the opportunity to learn from their classmates' perspectives. • With practice, such groups can be formed and disbanded quickly without much disruption.	• These quick, informal groupings—once you have practiced the procedures with your students—are useful tools for varying the pace of your lesson, adding variety to your introduction of new material and student practice. • Pair activities may make students more comfortable than larger groups.
Examples	• During your introduction to a lesson on the phases of the moon, you might ask students to think on their own about why the moon looks different at different times of the day. Instruct students to quickly form random groups of three or four to share and discuss their theory.	
Useful Tips and Common Pitfalls	• You should establish a routine for quickly forming pairs that will last the entire class period. See the "Around the Clock Partners" instructional tool (pp. 75-76) in the online **Toolkit**. ✕ • You should also have a routine for forming pairs that last only 1-5 minutes. See the "Think-Pair-Share" instructional tool for one approach (p. 77) in the online **Toolkit**. ✕	• A routine for quickly forming random groups of 3-4 is also necessary. Perhaps they should form groups with those seated near them, or count off to mix up the class "geographically." • In groups of 3-4 there may be increased off-task behavior due to the larger number of participants and the lack of established group relationships. • Groups of 3-4 allow for more complex problem solving and discussion.

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Cooperative Learning Groups

Cooperative learning is more than just placing students in small groups and having them complete an activity together. There are various cooperative learning theories and structures that call for particular methods of dividing up students' responsibilities in the group, handling collective production of assignments, and reporting back to the whole group.

When a task is completed, I ask my third graders to reflect on their group and its work. It is not uncommon to see a student raise his hand after group work and say, "One thing that worked well for our group was that we talked about what we were going to write and draw before we began working."

Regan Kelly, Los Angeles '99
Vice President – Eastern Region
Lighthouse Academies

Cooperative learning requires students to be responsible not only for their own learning but also for the learning of all others in the group. Research has shown that students who participate in cooperative learning tend to have more mature social skills, higher test scores, greater self-esteem, fewer stereotypes of individuals of other races or ethnic groups, and a deeper understanding of the concepts and skills they are studying. "Cooperative learning also creates the potential for cognitive and metacognitive [thinking about how they are working and thinking] benefits by engaging students in discourse that requires them to make their task-related information-processing and problem-solving strategies explicit (and thus available for discussion and reflection)."[32]

Generally speaking, cooperative groups should be as heterogeneous as possible, first by ability, and then by other factors such as gender, culture, and learning styles.

Successful cooperative learning groups meet the following criteria:[33]

1. **Facilitate interdependence.** Students must be dependent on each other to such an extent that one student cannot succeed unless everyone succeeds. Group goals and tasks should be designed and communicated to students so that they believe they "sink or swim" together, with each group member responsible for a unique contribution that is required for group success. To create this dynamic you might establish mutual goals and mutual rewards (e.g., if all group members achieve an 80% or higher on the test, each will receive bonus points). Because the teacher is not directly leading the group, students develop a sense of ownership and responsibility.

2. **Instill individual and group accountability.** The group must be accountable for achieving its goals and each member must be accountable for contributing his or her share of the work. This means that the teacher needs to formally and informally assess the performance of each group member as well as the entire group by having students complete a form outlining exactly how they contributed and giving individual tests on the objectives. Groups can also be responsible for their members by taking notes and reviewing missed assignments when students are absent.

In retrospect, I think I over-relied on cooperative learning. There are some things that it's good for, but at the end of the day, each students needs to truly master the material – and too often working in groups means individual students don't get as much practice as they need if they're ultimately going to be able to do the work on their own.

Jerry Hauser, Los Angeles '90
CEO, The Management Center

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[32] Brophy, Jere. "Generic Aspects of Effective Teaching." *Tomorrow's Teachers*, ed. Margaret C. Wang and Herbert J. Walburg. Richmond, CA: McCutchen Publishing Corporation, 2001, p. 32.

[33] This material was adapted from (1) Johnson, D.W., R.T. Johnson, and E.J. Johnson-Holubec. *Cooperation in the Classroom*. 6th ed. Edina, MN: Interaction Book Co., 1993; and (2) Stahl, Robert J. *The Essential Elements of Cooperative Learning in the Classroom*. ERIC Digest, 1994, ERIC ED370881.

3. **Teach students the required interpersonal and small group skills.** In cooperative learning, students must be taught social skills such as compromise, encouragement, constructive criticism, leadership, decision-making, and conflict-management. Teachers often need to teach and model these skills and assign students specific roles (Praiser, Encourager of Participation, Facilitator, Checker for Understanding, etc.) to help students consciously develop these skills.

4. **Allow time for group cohesion and group reflection.** While students can stay in cooperative groups for any length of time, a period of four or more weeks allows groups to reap the social and academic benefits of cooperative learning. Cooperative groups also need to have structured time to reflect on how well they are achieving their goals and interacting together. Again, this reflection skill is something that needs to be taught and modeled.

Problem Solving / Inquiry
One way in which students of varying levels can work cooperatively and contribute to a common cause is through a problem solving activity. Inquiry problems involve the use of real-world cases to tease out essential learning for students. Typically, the teacher presents a vignette, story, or scenario related to the concept or skill under study. Through discussion, students then analyze, synthesize, and evaluate the facts or circumstances associated with the case. Inquiry problems are most effective when students can relate (cognitively or affectively) to one or more aspects of the case intimately.

The general process for problem-based learning is:
    (1) Choose a compelling case
    (2) Define the nature of the problem (may involve illustrating the problem)
    (3) Compile relevant information (ask questions, do research)
    (4) Formulate and carry out a solution
    (5) Have students assess their solutions and debrief their understanding in terms of the lesson objectives
    (6) Conclude with further examination of issues, another case, or final resolution of the problem

In one Web-based science lesson for sixth-graders, students are told that, due to several environmental disasters, the Earth is no longer habitable for humans.[34] Students must research the other eight planets and determine which one will best meet humanity's needs. The assignment suggests several websites to use for research purposes and requires students to write a report to the United Nations explaining their conclusion and justifying it with examples. By the end of the lesson cycle, students learn that this mission was technically impossible, given that none of the planets feature all of the features that are needed to sustain human life. In addition to learning the various facts and concepts that make Earth unique, students develop a greater sense of responsibility about the environment, given that this is the only one we've got!

Some classes even go beyond historical or hypothetical situations, and look in their own backyard for problems to solve. Imagine your science students demonstrating an interest in the neighborhood pond and pointing out a dramatic decrease in wildlife. You could design a problem-solving unit around the ecological issues of the pond. The point of learning particular knowledge and skills objectives would grow naturally out of student curiosity, not teacher mandate.

Inquiry methods tend to engage students because they see the real-world applications of the concepts or skills that they have learned. At the same time, inquiry learning allows students to practice the process

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[34] "Moving Day: An Alternative Earth."
http://www.geocities.com/nck12eubanksre/ritaeubanks/telefolio/solarwebquest.htm, accessed 1/31/07.

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of problem solving. However, this method also may require teachers to prepare a great deal of materials, as well as ensure that all students are engaged in the process to master the intended objectives.

If these examples seem too grandiose to implement on a regular basis, note that inquiry and discovery learning can be as simple as asking students to confront an unusual quirk of your subject matter.

- One potential lesson involves presenting your class with two glasses of water. In one glass, the egg has sunk to the bottom. In the other glass, the egg is floating at the water's surface. When asked to explain what happened, the students may offer a simple explanation for the difference: one egg has more air inside, so it is lighter and thus floats. But switching the eggs from their respective glasses yields a surprising twist: the egg that had floated now sinks, and vice versa. Students would now need to change their hypotheses, eventually coming to the correct conclusion—that one glass contains salt water, which allows the egg to float.[35]

- In order to help students discover the social elements that create prejudice, a social studies teacher might recreate the famous Jane Elliott "Blue Eyes, Brown Eyes" experiment by treating students differently based on some arbitrary physical characteristic – and debriefing the experience afterward.[36]

- Some language arts teachers present two sentences to their students; in pairs, students must use their available resources (their textbooks, their keen wit) to determine which is the grammatically correct sentence and justify their answer. Is it "the crowd was scattered in all directions" or "the crowd were scattered in all directions"? Presto! Instant debate.

IV. Self-Directed Independent Work

As mentioned during the section on student grouping, independent work (i.e. "groups" of one) involves all students working independently on an assignment, or the teacher working with one child while others work independently. Independent work allows students to progress at their own pace on a class-wide learning objective and gives the teacher the opportunity to observe individual student progress.

In order to effectively implement independent work, students—especially young students—need to learn skills to behave and work effectively on their own. Look back at the "useful tips and common pitfalls" to independent work in Section I of this chapter for some strategies to help students work independently.

There are two main strategies for enabling students to conduct self-directed independent work: centers and projects. We will consider each in turn.

Centers
Centers are specified areas in the classroom that allow students to work at their own pace on specified activities. In order to support the individual needs of each student, centers can have permanent activities (such as the classroom library, with multi-level materials) or changing ones that support your current unit of study.

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[35] Ormrod, Jeanne. *Educational Psychology*. Upper Saddle River, N.J.: Merrill, 2000, p. 544.

[36] Kral, Brigitta. "The Eyes of Jane Elliott." *Horizon*. http://www.horizonmag.com/4/jane-elliott.asp, accessed 1/31/07.

Centers can be used at every grade level, although they are more prevalent in the elementary classroom and are always present in the early childhood/pre-K classroom. You can develop centers for writing, reading, science, math, art, etc., but they should all perform one of three basic functions: **enrichment** (to deepen students' current understanding of content or skills), **skill development** (to introduce or practice new skills), or **exploration** (to incorporate student interest or provide opportunities for student discovery). One organizational benefit to centers is that, rather than finding the various materials and manipulatives for a given task in all corners of the room, students working on the same activity congregate at one station.

When you are creating a center, you should:

1. **Decide on the type of center.** Should it be for enrichment, skill development, or exploration?

2. **Specify the outcomes.** What is your objective for students at each center?

3. **Create center activities and instructions.** Be sure to include varied levels of work to allow students to focus on their current skill level. For example, have reading material at a range of grade-levels or math problems at various levels of complexity. You should also ensure that students are able to accomplish the work independently or with the help of peers. Make instructions extremely clear so they can focus and learn without your direct guidance.

4. **Model how to use centers.** As with any new instructional method, you will have to teach students how to use centers effectively. Discuss, model, and practice appropriate behavior while at the center and while moving between centers (if students will rotate through each center).

The possibilities for using centers in a pre-K classroom are unlimited! Centers allow us to create purposeful learning opportunities for our students. In my preschool, we incorporate the whole range of developmental objectives into centers -- from fine motor development to language, literacy and science. Choosing interesting themes not only helps in our planning, but keeps our students engaged. For example, one of our thematic units is "Animal Action." In the dramatic play center, we create a pet store where children can count money at a play register and use notepads to write receipts. In the science center, we bring in goldfish and teach our students how to take care of them. We stock the library with books about the animals. And in the blocks center, our students build doghouses for their "pets" to sleep at night. I never underestimate the value of social development during centers too. Our students learn how to cooperate by negotiating who will be the customer and who will run the store in the dramatic play center.

Amy Fatall, NYC '99
Education Director
Urban Child Academy

5. **Provide constant feedback to students.** You should review what students learned and did at each center in order to reinforce the key skills and concepts. That might involve spending a brief amount of time with each student while they are at the center or taking time at some later point to explicitly review what was learned at each center with the whole class.

Perhaps the best way to understand how centers work is through an example. Consider the following:

Imagine your sixth-graders are reading "Where the Red Fern Grows" and you want them to get more out of it than, well, tears. You begin the day's lesson with a whole group reading of the first half of the chapter. You and individual students take turns reading a few paragraphs out loud to the entire group. Having studied the sixth grade standards (and designed a long-term plan and unit-plan accordingly), you have identified your objectives for this lesson as the following: the student will be able to...

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   a) Utilize context clues to determine the meaning of new words
   b) Identify and use descriptive, sensory language in narrative writing
   c) Identify shifts in perspective in narrative writing and incorporate differences of perspective into their own writing

During the 15 minutes of whole group reading, you periodically stop and model those skills at spots you have identified as rich teachable moments for those skills in the book. After fifteen minutes, you reach the suspenseful climax of the chapter. You stop the whole group reading and have the students finish reading the chapter silently at their desks. Once students reach the end of the chapter, they quietly go to their assigned "learning center." (There are no transitional management problems because during P.E. last week, you all practiced learning center transitions.) You have set up six learning centers around the room, with each able to accommodate five students. You have addressed each of the three objectives at two of the learning centers.

• At "Context Clues Center 1" you have pulled five sentences from the part of the chapter that students read themselves that contain new vocabulary words. You have a poster explaining the process for using context clues to determine the meaning of new words and you have a worksheet that leads the students through this process with those several sentences.

• At "Context Clues Center 2" you ask students to write down five of their own sentences that include vocabulary words previously unfamiliar to them. They follow the same procedure as above to use context clues to determine the meaning of their chosen words.

• At "Sensory Language Center 1" you have a "Sensory Language Scavenger Hunt." You post examples of sensory language for each of the five senses from earlier chapters in the book. At this center, students must find two examples of sensory language in the chapter you just read for each of the five senses.

• At "Sensory Language Center 2" you ask students to rewrite five sentences from the chapter they just read and include sensory details in their revised sentences.

• At "Perspectives Center 1" students are asked to identify one scene that contains a shift in perspective. They must identify the characters involved and identity the particular point at which the perspective shift occurs.

• At "Perspectives Center 2" you have pulled one paragraph from the chapter. Students must rewrite the paragraph from another character's perspective.

Each student spends 20 minutes at each learning center. You use a kitchen timer to signal times to shift stations. While students are working at the stations, you are circulating, giving guidance, and checking for understanding. You expect each student to complete three centers today and the other three during Language Arts Block tomorrow. With the extra time in your Language Arts Block tomorrow, you will review the objectives during a whole class discussion, giving students opportunities to share the vocabulary words they are learning and the sentences and paragraphs they wrote independently at "Sensory Language Center 2" and "Perspectives Center 2."

This, of course, is just one of the many, many ways you could approach the use of learning centers in your classroom. Teachers often incorporate technology, such as computer work or audiotapes, into learning centers. Learning center content can be readily calibrated to match the achievement level of different students.   From a classroom management perspective, learning centers are an excellent way to

maximize students' learning time. Keep in mind, however, that learning centers require a front-end investment of time to create and to familiarize students with the learning center processes. Students should learn to record their own progress and may need to practice transitions among centers.

Independent Projects
Independent projects also support the needs of all students, as they can be modified on an individual basis with regard to content/skill, length, type of presentation, etc. Perhaps you have a student who often finishes his student practice in half the time it takes other students. You might want to work with that student to create an individual research project he can work on while others are finishing the regular assignment. Perhaps you have a student who has a specific deficit in his prerequisite knowledge. In this case, you might develop an independent project for this student that will address his skill development and also allow you to continue to instruct the rest of the class. Perhaps you want all students to work on a project, yet you recognize the need to vary the length and type of presentation depending on each student's current ability level. For example, some students might present their project orally, while others present a written document. Whether you assign an independent project to one or all of your students, it is important to clearly outline the criteria for a successful project, draft a clear timeline of expectations and provide constant feedback to students along the way.

V. Colleagues in Class – Effectively Managing Assistants and Aides

Some of you, given your grade level, subject matter, or school structure, will have a full or part-time assistant or aide in the classroom. Having help in the classroom can be a fantastic opportunity to maximize the impact of all of the instructional tools and groupings we have discussed in this chapter. Of course, the presence of this colleague has the potential to improve your ability to achieve academic gains of your students or to only complicate your day. The difference lies predominantly with how you take advantage of the situation.

Here are some tips to utilizing your classroom colleagues to further raise the academic gains of your students.[37]

1. **See yourself as manager.** What do good managers do? They look for the strengths of their staff and utilize those strengths to their fullest potential, while simultaneously supporting them in the development of new skills. Ask your assistant about his strengths and the role he would like to have in your classroom. Ask him what skills he would like to work on. Review what is going well and what could be improved on a regular basis.

2. **Invest your assistant in your goals for the class.** Not only should she know your vision for student achievement, your assistant should have a well-articulated role in making that vision a reality. Ask for her input on the skills and behavior of various students. Ask her for feedback on your instruction and interaction with students.

3. **Provide your assistant with clearly defined tasks.**
   a. Put him in charge of a particular center where he can review, drill, or extend student skills.
   b. Ask her to work with students who were absent, helping them to complete missed assignments.

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[37] For additional suggestions, see Morgan, Jill and Betty Y. Ashbaker. *A Teacher's Guide to Working with Paraeducators and other Classroom Aides*. Alexandria, VA: ASCD, 2001.

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c. Provide him with a list of students they should target throughout the day, checking that they are following directions and grasping the material (this is especially helpful to you during times of whole group instruction).

d. Have her facilitate the "time out" space in your room. Placing an adult in charge of the space allows for it to be a reflection center. If a child goes to time out, you can keep working with the rest of the class while the assistant supervises the student as they fill out a reflection sheet (which asks the student to detail what was done, what could have been done differently, and ideas for how to avoid future such disruptions or problems).

e. Ask the assistant to be in charge of bulletin boards or other room decorations. This is especially helpful if you have a bulletin board that changes on a daily basis, such as a weather calendar.

I realized early on that my teaching assistant, though well intentioned, lacked some skills that prevented him from being an outstanding child-care worker. I felt that it was my responsibility to train him. During our bi-weekly meetings, I gave a "mini-training" for him in areas such as talking to difficult students, tutoring one-on-one, leading the classroom when I was called out, meeting with parents, etc. I worried initially that my assistant would be insulted by these mini-trainings, so I tried to make them very professional, with hand outs and role plays. My assistant told me he really appreciated this guidance, and he grew immeasurably throughout the year.

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f. Ask him to work with students who finish their work early. Manipulative activities that help apply and extend the learned skill can be enjoyable for the assistant and productive for the student.

g. Put her in charge of various paper work and tracking systems (checking homework, grading quizzes, completing behavior or student progress charts, etc.).

h. If you have students with significant behavior disorders or other exceptionalities, the assistant can take them for quick walks or monitor the student's out-of-seat activities.

i. During small group activities, ask him to focus on one or two groups (vary the level of students he works with – he shouldn't just interact with "low" or "high" group).

Make sure your assistant feels appreciated for all he or she does. Assistants need praise just like students (and teachers!). Thank them frequently. If they have been doing an exemplary job, write a note to your principal saying so. Have your students learn to appreciate your assistant as well; perhaps have the students write thank-you notes to him or her.

Conclusion and Key Concepts

In this chapter, we focused on instructional tools used during the "heart of the lesson"—the Introduction of New Material, Guided Practice, and Independent Practice of New Material.

- Teachers use a whole range of grouping strategies as they make choices about how to deliver instruction and have students practice new material. Whole class grouping has the benefit of efficiency, but can risk losing students' engagement. Small groups work well to teach particular skills or to supervise student practice, but often takes more time than whole class grouping.

- Heterogeneous grouping can benefit both the more and less advanced students, but raises concerns about holding back high achievers and intimidating lower achievers. While it may be more efficient in terms of your instruction time, homogeneous grouping may risk stigmatizing students put in lower groups.

- Perhaps the most traditional instructional delivery methods are demonstration and lecture. While a lecture is highly efficient, special care must be taken to ensure students remain engaged. The teacher must consider ways to draw the students into the learning process, paying careful attention to his or her own style of lecture, focusing on clear outcomes, and making modifications for visual learners.

- Teachers often overlook basic questioning techniques as a means of delivering instruction and leading student practice. This tool, however, is one of the most commonly used means of instructing and practicing, and should be strategically designed and implemented. Teachers may ask questions to gain information, but they may also ask them to stimulate thought. Various types of questions (managerial, rhetorical, closed, open) may be more and less effective for this second purpose in different contexts.

- When tackling issues that do not have clear-cut answers, you may choose to foster a discussion to generate student ideas and pool different perspectives. Students can also "discover" the definition of an idea with techniques like discovery learning.

- Graphic organizers are a highly effective means for both delivery and practice of new material. If well-designed, they can help structure new ideas for students and immediately engage them in new and difficult concepts.

- As long as you set clear guidelines, cooperative groups and inquiry-based learning are two ways that students can work together to practice skills or work on a common problem.

- Self-directed independent work can take various forms in the classroom, including learning centers and independent projects.

- By investing your assistant in your classroom goals and providing clearly defined tasks for him or her, you will find yourself able to get your own job done more quickly and easily – and reach more students in the process.

In the next chapter, you will explore how to choose between the various instructional methods you have learned here. Rather than relying on your favorite strategy, you will know how to plan lessons that help you reach your objective most efficiently and effectively.